

**Culinary Arts and Sciences VII**  
Global, National and Local Perspectives

Editors

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# **Seventh International Conference on Culinary Arts and Sciences**

## **Global, National and Local Perspectives**

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## Preface

As many of you are aware, the idea for an International Conference on Culinary Arts and Sciences was first discussed in late 1993 when the Worshipful Company of Cooks of London established a Centre for Culinary Research at Bournemouth University. At the time it was felt there was a need for a forum that could bring together culinary artists and scientists who could present their research and generally discuss ideas within a multidisciplinary and relaxed surroundings. These initial thoughts led to the first Conference (ICCAS) which was held at Bournemouth University in 1996. It proved to be so successful that further conferences were held at Bournemouth University in 1998, the University of Cairo, Egypt in 2001, Örebro University, Sweden in 2003, Warsaw Agriculture University, Poland, in 2005 and finally the Norwegian Hotel School, University of Stavanger in 2008.

At this stage it was thought that ICCAS had run its course and that there was little interest for a further meeting. However, there was a constant stream of enquiries asking when the next conference was planned; hence a decision was made to hold another conference and bring it back once again to Bournemouth.

Since its inception, the conference theme has always been Culinary Arts and Culinary Sciences. The food and foodservice industries are a large and integral part of most economies but in academia they are invariably treated as separate and distinct disciplines. These operate in isolation, often blissfully unaware of what each other are doing. The primary purpose, therefore, has and continues to be to breakdown barriers which might exist and bring people together so that each can see, not only what the other is doing, but also to foster a better understanding of some of the issues, problems and concerns they have. As before, we hope that we have achieved this with the Seventh International Conference.

We have always prided ourselves, and others have followed, by being able to publish delegates' papers to coincide with the start of the conference. So very often, conference papers never see the light of day until years after the event. Once again we have published the refereed papers and made them available at the time of registration. We would like to thank all of those authors who adhered to the tight deadlines and also to those who reviewed the scripts thereby ensuring the academic credibility of the papers concerned. However, publishing in the Proceedings is just the first stage of the process and we hope and encourage authors to rework their papers for further consideration in academic journals, such as *Perspectives in Public Health* and *Hospitality & Society*.

Organising a conference is not only expensive but also very time consuming; hence we are grateful to the Worshipful Company of Cooks who have again been the main sponsor. In addition, H. J. Heinz have also been most generous with their help and for this we are extremely grateful.

The organising of a conference could not have happened without the hard work and dedication of a number of people including the members of the Scientific Committee and the reviewers who gave their time and effort to review submissions. We are also grateful to all the colleagues at Bournemouth University and to the Events Management students who helped put together the programme and the conference material.

We wish you an enjoyable conference and a pleasant stay here in Bournemouth and hope to see you again in the future.

Conference Chair

John S.A. Edwards, Ph.D., Dr Honoris Causa (Orebro University, Sweden)

Conference Secretariat

Heather Hartwell, Ph.D, Assoc Prof.

Peter Lugosi, Ph.D.

## Prologue

The Worshipful Company of Cooks is one of the oldest London Livery Companies which can trace its origins back to the 12th Century. It was founded from two guilds of cooks in medieval London - the Cooks of Eastcheap and the Cooks of Bread Street and received its first charter in 1482.

Initially it was responsible for controlling all the catering trade within the 'Square Mile' but today the Company is no longer an association of tradesmen in its original controlling sense. Its present membership continues to include craft tradesmen, while the Company as a whole, engages actively with a broad range of organisations and charities associated with cooking. Thus, the Company's purpose in contemporary times has come to rest in a public search for the common good, to contribute as effectively as it can to the pursuit of a good society - to be socially useful. This we have done and will continue to do, by awarding charitable grants and engaging in other activities in the pursuance of cookery and catering in their widest contexts.

We have been associated, through sponsorship, with the International Conference on Culinary Arts and Sciences since its inception and we are once again pleased to be able to sponsor the Seventh Conference.

We would like to thank Bournemouth University and the conference organisers for taking on this task but also, the delegates for their contribution, without which it would not have happened.

As the Master for this year, may I take the opportunity of wishing you a successful and enjoyable conference and should there be an organisation willing to take up the challenge for a further symposium, we would consider a request to assist.

John B. Righton

Master

The Woshipful Company of Cooks of London

**INVITED KEYNOTE SPEAKERS**

## **Perspectives in foodservice from Europe**

**Bent Egberg Mikkelsen**

*Research Group for Applied Nutrition & Public Food Systems  
Aalborg University, Denmark*

Food plays a vital role in some of the grand challenges that modern societies are struggling against. Food consumption accounts for one third of man-made climate impact and food plays an important role in the etiological pathways involved in the development of obesity and type II diabetes as well as other diet related disorders. Both of these serious challenges are addressed in a growing number of policy papers from the OECD, European Union, Council of Europe, WHO, UN Climate Panel etc. as well as from national government bodies across Europe.

These documents all call for action in relation to healthier eating and more sustainable consumption and since eating out of home accounts for a considerable and increasing part of our food intake in modern society it is obvious that the challenges needs to be addressed by all public actors involved in the food supply chain including the out of home eating sector. Especially the institutional part of this sector – the public foodservice - cost sector catering - has an important role to play. This sector is responsible for one or more of the daily meals for a large part of the population that eat in canteens, at hospitals, schools, kindergartens, institutions etc. And in many countries the role that food plays as a part of the public welfare provision is increasing.

This paper looks at the implications of the grand challenges for the food service sector with emphasis on public food systems. It aims at answering some of the questions that public food is facing in modern society.

Can we continue to regard the food service as only a provider of food and meals? Or can we take an extended view and look at the potential for learning experience. Do we need to rethink food in the public sphere and consider them as more complex and look at them in a systems perspective? And can food service take on an increased responsibility when it comes to counteracting obesity and at the same time play an active role in protecting environment and climate mitigation? Are the semi professions responsible for the different tasks in food service equipped with adequate competencies to meet the new challenges?

The paper takes as a point of departure the notion of settings as defined in the Ottawa charter and looks at the role of public spaces and arenas where foodservice plays a role in relation to health seen from a health promotion and education perspective. It continues by exploring the notion of foodscapes and its application as a conceptual framework for the analysis of the foodservice sector.

About the author:

Bent Egberg Mikkelsen is Professor of Nutrition and Public Food Systems at the Research group for Food, People and Design at Aalborg University. He holds an MSc in Food Science from the Royal Agricultural University, Copenhagen and a PhD in Social Science, from Roskilde University. He is the author of a large number of publications on public health nutrition and sustainable public food systems. His work includes expert assignments carried out for the Council of Europe, Strasbourg, on Nutrition in Schools and Nutrition in Hospitals and tasks for the European WHO regional office in relation to the Nutrition friendly Schools Initiative as well as tasks on Healthy eating at school for EU's DG/SANCO.

## **Food service perspectives from the southern hemisphere: “Making every mouthful count”**

**Karen Walton**

*Smart Foods Centre, School of Health Sciences, University of Wollongong,  
Wollongong, NSW 2522, Australia*

Food is a phenomenon that everyone knows something about, and as such it is often undervalued in the health care context. It is very familiar, it isn't technological and it is often labelled as a 'non-clinical, hotel service' which does not attract the focus that it rightly deserves. The likely changes to dietary intakes posed by hospitalisation and resultant factors such as anxiety, diagnosis, treatment, altered environment and ill health are often disregarded as it is thought that patients will improve their dietary intakes and regain any lost weight when the treatment is successful and they are feeling better.

Numerous changes have occurred to hospital food service departments in recent years. These have included an increased use of: cook chill technology, clustering of health services and resultant central kitchen production units (CPUs), computerised menu systems, usage of pre-packaged, portion control food and beverage items. Shorter menu cycles, less customisation of meals and snacks, less choice of food at point of service and less time available to assist patients has also occurred. Other changes introduced to varying degrees include: the use of food fortification, more nourishing 'food based' snack options, volunteer feeding assistance, choice at point of service in some wards, and trials of protected meal times.

Appropriate food service provision and encouragement is essential for the nutritional support of hospitalised patients. Being vigilant in continuously reviewing and improving food service systems and feeding assistance strategies becomes even more relevant as the population ages. Older patients have longer, more frequent hospital admissions and they are often admitted to hospital with multiple co-morbidities, with some already malnourished. Approximately 13% of the Australian population are currently over 65 years, with a projection of 27% of the population by 2051.

The Dieticians Association of Australia is currently leading a proposal to develop menu planning standards for residential aged care facilities in Australia and New Zealand. There has been development and review of hospital menu planning standards in no less than five states in recent years, with a Trans Tasman approach to these standards also proposed. The state based standards advocate the important role of 'food as medicine' and the need for 'live'



standards that are evaluated and updated regularly in response to the needs of the consumer and reviews of wastage, and resultant dietary intakes.

This paper explores and identifies issues that influence dietary intakes, barriers to nutritional support and priority opportunities to assist in improving food service provision within Australian hospitals for long stay, elderly patients. There are numerous barriers to adequate dietary intakes, and a ‘toolbox’ of priority interventions is required. A number of these involve a significant financial contribution; however the cost of these should be carefully balanced against the cost savings from enhanced nutritional care. It is time that food services were seen as a core component of clinical care and there is a valuable role for health economists in determining cost-benefit in future outcomes focussed interventions.

About the author:

Dr Karen Walton is an Accredited Practising Dietician (APD) and senior lecturer at the University of Wollongong. She is currently lecturing in dietetics, food service dietetics and research for nutrition and dietetics students. She is also the coordinator of the Bachelor of Nutrition and Dietetics course there.

Her particular areas of research interest include food service dietetics and nutrition requirements for long stay hospital patients, particularly the elderly. Karen has recently completed a PhD in this area, titled, “Nutrition and food service systems for long stay elderly patients. A contextual analysis - Making every mouthful count.”

Karen is also the national convenor of the Dieticians Association of Australia (DAA) National Food Service Interest Group.

## **Contemporary topics in sensory and consumer research on foods**

### **Herb Meiselman**

#### *Herb Meiselman Training and Consulting Services*

This presentation addresses three topics of growing interest in sensory and consumer research on food products and food service. The three topics are: (1) the context or environment in which food is consumed; (2) the psychographics, not just demographics, of the eater; and (3) measuring emotional reactions to foods and food service situations.

Some of the contextual research was conducted at Bournemouth University using the student training restaurant and the student canteen as well as other eating locations in the Bournemouth area. We learned that the acceptability of food varies with where the food is served and consumed, and we have attributed this contextual effect to the expectations of the eater. We also conducted research on a number of contextual variables; many of these studies were conducted here at Bournemouth University.

While many researchers study the demographics of eaters (age, gender, income, etc), there is now growing interest in segmenting consumers based on their attitudes and habits, their psychographics. We have been conducting research on food involvement (how important food is to you) and food neophobia (how reluctant you are to try novel foods). Most food research studies use highly involved, less neophobic people, because they like to do food tests. Another important psychographic measure is restrained eating, the tendency to restrict food intake: this helps to identify dieters from regular eaters, and dieters often select food differently and emotionally react to food differently.

Which brings us to the growing topic of measuring emotions in response to foods: this is perhaps the hottest topic in consumer research on foods. There are currently no established methods for measuring consumers' emotional reactions to foods, and unfortunately there is still too much influence of past clinical research methods which emphasize negative emotions. A number of developing methods show that emotional responses to foods are generally positive, and also that it takes many emotional terms to adequately describe how consumers react to foods. This area of research is moving ahead very rapidly.

About the author:

Dr. Herbert L. Meiselman is an internationally known expert in the fields of sensory and consumer research, product development and food service system

design and evaluation. He is Co-Editor of the journal *Food Quality and Preference* published by Elsevier, and was a founding Editor of the *Journal of Foodservice*, along with Prof John Edwards of Bournemouth University. He is an Advisory Editor for the journal *Appetite*, also published by Elsevier. He has held Visiting Professorships at both Reading University and Bournemouth University, UK, and Orebro University, Sweden. He is currently on the Research Committee of the Institut Paul Bocuse, Lyon, France.

Dr. Meiselman retired as Senior Research Scientist at Natick Laboratories where he was the highest ranking Research Psychologist in the U.S. government. His accomplishments were recognized with a 2005 Presidential Award. In 2003, Dr. Meiselman was Co-Chairman of the 5<sup>th</sup> Pangborn Sensory Science Symposium in Boston, the largest international food sensory and consumer research meeting. He is one of the founders and lecturers of the *Targeting the Consumer* short course series, which currently produces 6 courses each year in Europe and in the USA, and at selected other locations and events. Dr. Meiselman is the author of over 170 research papers and 4 books, and has lectured extensively in the United States, Europe, New Zealand, the Middle East and Japan.

## **Heinz – full of beans but not salt**

### **Colin Gordon and Tristan Robinson**

*H J Heinz Co Ltd, South Building, Hayes Park, Hayes, Middlesex, UB4 8AL*

#### **Introduction**

Heinz canned its first batch of baked beans in tomato sauce in 1895 and at the turn of the century they were imported into Britain. They were manufactured for the first time in the UK in 1928. Foods preserved by the canning process do not necessarily require the addition of salt for preservation purposes. Despite this, the majority of canned foods have salt added to them as part of their traditional recipe, most often for cultural or taste reasons rather than any preservative effect. In the present climate of concern over salt in people's diets, food manufacturers have been encouraged to avoid adding unnecessary levels of salt to their produce, yet very little attention has been paid to the level of salt that is acceptable for an individual to choose and consume a food and obtain pleasure from the process, not merely through satisfying nutritional or safety requirements. Heinz has long been committed to progressive salt reduction as well as being a partner in salt awareness campaigns.

#### **Reducing salt in canned foods**

Heinz has always made it its business to take nutrition seriously. The company founder, Henry J. Heinz, was a leading figure in the US campaign for Pure Food Laws and it has long been a committed company policy to produce good food from quality ingredients without the use of artificial colours or preservatives, whenever possible. In addition to these commitments we have long been conscious of the evidence for a link between excessive salt consumption and ill health. That is why, in the early 1980s, Heinz began assessing the levels of salt in over 100 of its products and started to gradually reduce salt content alongside the normal recipe redevelopment programme. Recently, as part of the 'Heinz Good Food Every Day<sup>TM</sup>' food policy, more ambitious changes have been made to the salt levels in the Heinz canned Quick Serve Meals range (Baked Beans, Soup, Pasta in Tomato sauce).

In 2004 Heinz performed a review of the nutritional content of its product portfolio and set a series of nutrient and ingredient criteria that products should meet to bring them into the context of a healthy diet. This review of the Heinz nutrition policy was part of a company-wide commitment to providing 'Heinz Good Food Every Day<sup>TM</sup>'. The quantities of macronutrients in foods were

referenced against dietary reference values for the UK population to ensure that no food contributed proportionally too much of any one macronutrient (too little in the case of protein) in comparison with its contribution to daily energy intake. A critical part of the nutrition criteria used in the review was the level of sodium contained in each product. As no energy is contributed by sodium, another method of deciding appropriate sodium levels in products was required.

In 2003 the Scientific Advisory Committee on Nutrition report on Salt and Health recommended a target reduction in average intake of salt by the population to 6g per day<sup>1</sup>. The publication of a draft 'Salt Model' by the Food Standards Agency in September 2003 and subsequently revised in February 2005 gave the food industry a first glimpse of the extent of reductions that were expected of them to achieve the Department of Health's target of reducing the nation's salt intake to 6g per day by 2010<sup>2</sup>. Whilst some of the target figures contained within the salt model were ambitious, it was decided by Heinz to utilise these targets to set criteria for maximum or average salt content of specific food categories, e.g. baked beans, retail soups and pasta in tomato sauce. Priority was given to reducing salt levels in popular products so that the greatest impact could be made upon consumers' intakes of salt and also in products commonly consumed by children. A pragmatic approach was taken to achieving the targets set out in the salt model: it was accepted that some of the reductions could not be achieved overnight without negatively impacting upon product taste and consumer satisfaction. Therefore, for some products, a framework of interim targets was set, thus enabling a progressive reduction in salt content over time, whilst still striving to achieve reductions as quickly as possible.

Along with safety, product quality and taste 'performance' is of primary importance to food manufacturers, since a consumer will only purchase a product on subsequent occasions if they have enjoyed it, choosing another option if the product has not met with their satisfaction. Of overriding concern to manufacturers is the need to ensure that any changes to recipe do not impact negatively upon acceptability, but rather that they result in a product preferred to the previous recipe. From research conducted in the early 1980s (unpublished data) Heinz knew that consumers desired healthier foods, such as options lower in salt, but were not willing to trade-off taste preference to achieve this. The gradual decline in salt content of baked beans, soup and pasta recipes from 1984 to 2002 went largely unnoticed because the step changes were gradual and too small to be detected by the consumer over such a broad period of time. To meet the growing demand for further reductions in salt in recipes, however, a more ambitious approach was needed which would require detailed research and careful management if consumer acceptance was to be maintained.

Although Heinz had historically been working to reduce the levels of added sodium in its range of QSM the decision was made to drive some more ambitious reductions to help meet the UK government's goal of reducing the population's daily salt intake to an average of six g/day. It was acknowledged that care would need to be taken to establish the optimal level of reduction that would allow a significant amount to be removed from the product, but which would not negatively influence consumer perception and acceptance of the reformulated product. A programme of research was commissioned that included consumer preference and sensory analysis components to determine this optimal level of salt reduction.

### **Consumer acceptance test of Baked Beans**

Approximately 160 eligible consumers were recruited to the study, in which they evaluated six different Baked Beans recipes differing only in their salt levels. The order in which consumers were presented with the different recipes was randomised and counterbalanced to ensure that no effect of order of presentation of recipe was observed. The Baked Beans were heated and served according to the manufacturer's instructions. Each of the six Baked Beans recipes were presented to the consumer across a 45-minute period and questions completed, including consumers' perceptions of the appearance, smell, colour, taste, aftertaste, overall opinion of the Baked Beans and the likelihood of them buying that particular recipe.

The six Baked Beans recipes tested were as follows: the then current standard recipe, salt reduction recipes of 9%, 15%, 20%, 26% and 37%. Appearance, smell and colour were largely unaffected by reducing the salt content of the recipe. Taste and aftertaste were rated as significantly lower for the two highest salt reduction recipes. The overall opinion of the consumers tested was that the 15% salt reduction recipe was the most preferred of the recipes, followed by current standard and 20% reduction recipes. This was also reflected by consumers' reported likelihood to buy the 15% reduction recipe above the then current standard recipe. Overall, the consumer scores for all of the products were similar, however there was a clear delineation of acceptability to the consumer, with the 15% reduction recipe showing no decrement in preference when compared with the then current standard recipe and the two products with the most extreme salt reductions (26% and 37%) being substantially less appealing to the consumer.

### **Sensory profiling of Baked Beans recipes**

A second series of tests was conducted on the same Baked Beans recipes to objectively define and quantify any differences between them. Trained sensory panellists assessed the six recipes using quantitative descriptive analysis in a repeated-measures, controlled randomised manner. Various aspects of the Baked Beans' appearance, aroma, flavour, mouth-feel and aftertaste were described and quantified. The tests concluded that compared to other flavour characteristics such as haricot beans or sweetness, the recognisable salt levels in the recipes were low, although saltiness remained a discriminatory characteristic and a positive driver for product liking. Drivers for liking, such as beans' aftertaste, decreased, whilst drivers for not liking, such as sweetness, increased with increasing salt reduction, indicating that attention should be given to preventing any significant changes in such factors.

### **Implementation of results**

As a result of the recommendations of the consumer and sensory research it was decided to meet the approximate 30% salt reduction required by the FSA<sup>3</sup> in a two-stage process. This was to avoid any consumer acceptance issues that were likely to occur, as suggested by consumer testing of the 26±37% salt reduction recipes. In the first instance, 15% of the added salt in Baked Beans was removed from the recipe. This was followed, a number of months later to allow for consumers' tastes to adjust, by an additional 14% reduction to make the Baked Beans fall within the target average sodium level of 350 mg per 100 g set in the FSA Salt Model<sup>3</sup>.

The research also suggested that a 20% reduction could be made to the salt content of Spaghetti in Tomato Sauce without any negative impact upon consumer acceptance and this was implemented immediately in a single recipe change. Our Heinz Beans, Pasta and Soup recipes meet the Food Standards Agency salt targets for 2010, and many of these varieties already meet the 2012 targets as we progressively look to further reduce levels of salt. Heinz Tomato Ketchup also matches the 2010 salt target while Heinz Salad Cream and HP Sauce already meet the salt targets for 2012. All our Weight Watchers from Heinz frozen ready meals fall within the FSA 2010 target with most recipes already within the 2012 target average. All are within the 2012 maximum target.

Mention should also be made here of the range of Heinz Pasta Shapes in Tomato Sauce, which are distinct and different from the Spaghetti in Tomato Sauce recipe used in the consumer and sensory testing. Pasta shapes are predominantly eaten by children, usually from between the ages of 4±11 years. Because of this it was decided that special attention should be made to salt reductions in this food category. Pasta shapes are often eaten by young children at the time that

they are weaned off conventional ‘toddler foods’ and begin to move onto eating an adult-style diet. Unfortunately these diets do not take into consideration a child's requirement for lower amounts of sodium and can, therefore, be contributing to excessive salt intake in these children. An internal benchmarking exercise showed that there was a substantial step-change in saltiness from our own range of toddler foods, which contain no added salt, to that of Heinz Pasta Shapes in Tomato Sauce. It was reasoned that a child's taste, migrating from weaning/toddler food would accept a much lower salt content than was in the current recipe. Therefore, in addition to the initial 20% reduction in salt as happened to Spaghetti, Heinz Pasta Shapes in Tomato Sauce had a further 35% of its salt content removed. This resulted in a sodium level of 168 mg per 100 g, approximately half of the target average sodium level requested by the FSA<sup>3</sup>.

### **Project Neptune**

In parallel with the in-house ongoing activities on salt reduction, in 2002 a group of leading branded soup and sauce manufacturers joined forces to launch an initiative to explore ways in which they could support the Food Standards Agency's objective of reducing the amount of salt in the UK diet. Membership of this group, under the title of ‘Project Neptune’ included Baxter's, Campbell's Grocery Products Ltd, Centura Foods, Heinz, Masterfoods, McCormick Foods, Patak's, Premier Foods and Unilever Bestfoods. At the outset of this initiative, Project Neptune agreed to implement the following:

- A 10% reduction in sodium for branded ambient soups and sauces by the end of 2003 on the baseline figures for 2002.
- To make further reductions, of a similar order of magnitude, in 2004 and 2005, where technologically possible, safe and acceptable to consumers, i.e. a 30% reduction over three years.
- A policy whereby all Project Neptune members would ensure that any reformulated variety would be lower in sodium than the recipe it replaced and any new variety would be lower in sodium than its nearest equivalent in the same range.

The recipe redevelopment work ongoing at Heinz at the onset of this collaboration, combined with the more significant reductions outlined above, resulted in Heinz reaching its 30% commitment within two years, although Heinz continued to remain an active partner in Project Neptune for the duration of the collaboration.

In addition to the salt reduction work occurring in the traditional Heinz BakedBeans recipe, an additional variety of Baked Beans was launched, to provide the consumer with a choice of product that was substantially lower in



salt than the (new) standard recipe. Reduced salt, reduced sugar baked beans contain 173 mg of sodium per 100g, half that of the standard recipe. Acceptance of this recipe by consumers was, however, quite low and remains a niche product bought, in the main, by individuals specifically looking for lower salt offerings.

### **Consumer response**

The pre-reduction consumer and sensory testing was conducted to ensure that any salt reduction activity did not impact negatively upon consumer satisfaction with the products. The two-stage salt reduction in Baked Beans was subtle enough that very little negative response was monitored by our Careline. Indeed, consumer comments about the changes only occurred after the salt reduction programme had been publicised in the media, suggesting that it was the principle of changing such a well-established recipe that upset consumers more than the change itself. Therefore it may be suggested that taking steps to characterise the sensory profile of foods and how these profiles affect consumer satisfaction with foods can provide an effective means of optimising the extent of reduction, which does not impact upon consumer acceptability.

### **Conclusions**

We first started our salt reduction work as long ago as 1986, and since 1997 we have dropped the salt by 40% in Heinz Beans, 39% in Cream of Tomato Soup, 63% in pasta shapes, 38% in Heinz Salad Cream, 51% in HP Sauce and 29% in Heinz Tomato Ketchup. They still provide all the taste but with considerably less salt.

We continue to offer many of our most popular varieties with recipes that provide further reductions of salt and sugar vs. our standard products but without the addition of artificial sweeteners or salt substitutes. This year (2011) we introduced four varieties of our classic soup favourites including Cream of Tomato, Cream of Chicken, Cream of Mushroom and Vegetable with Reduced Salt recipes.

For the campaign to reduce salt in the nation's diet to be successful it requires effort from many players. It is hoped that the work that Heinz has conducted will have contributed to a successful campaign. Care will always need to be taken by manufacturers to achieve the balance between salt reduction to benefit health and a food's taste and consumers' acceptance of that food. If consumers choose to migrate from a lower salt option of a particular food to a different brand or different type of food that has a higher salt level then this does not benefit consumers' health and is also not appealing to the manufacturer of the

lower salt food. Further careful research is required to investigate the acceptance and motivation to consume lower-salt foods in a marketplace where variety allows the customer to let their diet be determined by their taste buds. Our work continues as we drive further salt reductions in line with changes in consumer taste.

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**SECTION 1 – FOOD SERVICE**

## **Perceptions of athletes on the food service quality of the athletes' cafeteria at the athletes training centre**

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**Keywords:** foodservice, athletes' perception, food quality

### **Abstract**

**Objective:** This study served to determine the perceptions of athletes on the food service quality of the athletes' cafeteria from four foodservice dimensions. The relationships between respondents' socio-demographic backgrounds, sport disciplines (aesthetic or non-aesthetic sport), nutrition knowledge and food service perceptions were also determined.

**Methods:** Self-administered questionnaires given to athletes who went to the cafeteria for their meals.

**Results:** The athletes (n=110) were most satisfied with the meal service quality dimension ( $4.13 \pm 0.72$ ) while least satisfied with the food quality dimension ( $3.77 \pm 0.75$ ). Significant differences in nutrition knowledge were observed among the athletes from different ethnic groups ( $p < 0.01$ ) and educational levels ( $p < 0.05$ ).

**Discussion:** The lowest mean score obtained in the food quality dimension implied that this may be the contributing factor towards the low attendance of the athletes at the cafeteria. Athletes' sport classification, nutrition knowledge and socio-demographic background were independent of their perception on the food services.

**Conclusion:** The results provided an insight to the Food Service Unit into the crucial criteria to be focused on in the implementation of their continuous quality enhancement measure. Future survey specifically on food quality needs to be carried out to ascertain the reason for poor ratings on the cafeteria food.

### **Introduction**

Proper nutrition is, undeniably, the key to keeping athletes' bodies healthy and having them perform at maximum potential. A poorly nourished athlete, definitely, will not have the competence to perform well due to the suboptimal

nutritional status. This is where the role of a good athlete's cafeteria comes into play to provide high quality foods for the athletes. Realizing the relationship between high quality food and athletes' performance, the Food Service Unit was established by the National Sports Council with the main role of providing foods to meet the daily nutrient requirements of the elite and non-elite athletes in the country so as to produce world-class athletes. The Food Service Unit also acts as the reference centre for sports nutrition, promote and encourage healthy eating habits and provide excellent foods via the modification of cooking methods and selection of high quality products. Apart from that, the cafeteria also provides the latest information regarding sports and nutrition through its nutrition information boards which was updated on a monthly or even weekly basis as an effort to increase athletes' level of nutrition knowledge.

Despite the availability of the Athletes' Cafeteria, with various distinctive features such as 30 day menu cycle, menu variation, high quality of food, flexible meal hours, and comfortable dining area, there seemed to be a trend where athletes were taking outside food instead of dining in the cafeteria. According to the Food Service Unit Annual Report of Reservation, the average attendance rate of athletes in the year 2008 was only 74.9%. Athletes who opted to eat outside or buy hawker food increase the risk of unhealthy food consumption and food borne illnesses. Jacobson<sup>5</sup> claimed that eating out will increase the potential for incidences of obesity and other health-related consequences. This high energy intake will further complicate the weight management problems which were mainly found in sports that emphasize leanness, thinness and aesthetic aspects, such as gymnastics, dance, figure skating, synchronized swimming and diving<sup>2,4</sup>.

Although nutrition information was made available, it was unclear if athletes were knowledgeable about the role of nutrition on athletic performance. The dietary requirements between athletes in aesthetic sports and non-aesthetic sports may be different and it is recognized that athletes may restrict dietary fat in an attempt to maintain low body fat<sup>6</sup>. Thus this study aims to investigate if nutrition education received among the athletes will affect their perception of the services provided by the cafeteria. Capra<sup>3</sup> found that consumers' perception on the service provided is an important aspect in the efforts to improve the quality of food. Many factors can influence athletes' food intake, including socioeconomic status, access to sufficient calories, intentional weight loss and body image disturbance and peer pressure<sup>1</sup>. However, the perceptions of athletes on the food service quality of the cafeteria were not known. The relationships between socio-demographic backgrounds, sports discipline, nutrition knowledge level and perceived food service quality were presently not well understood either. Therefore, this study aims to fill this void by determining the athletes' perceptions on the food service quality of the Athlete's Cafeteria and

determining the relationships between socio-demographic backgrounds, sports discipline, nutrition knowledge level and perceived food service quality.

## **Objectives**

This study served to determine the perceptions of the athletes on the food service quality of the cafeteria from four dimensions, namely food quality, meal service quality, staff/service issues and dining environment through self-administered questionnaires. The relationships between respondents' socio-demographic backgrounds (sex, ethnic group and educational level), sport disciplines (aesthetic or non-aesthetic sport), nutrition knowledge and food service perceptions were also determined.

## **Method**

This was a cross-sectional descriptive study conducted at the Athlete's Cafeteria at an athletes' training center. A convenience sampling method was used where athletes who had meals at the cafeteria for at least 3 months were recruited. A self-administered questionnaire was used as the instrument to determine the socio-demographic characteristics, sport disciplines (aesthetic and non-aesthetic), nutrition knowledge and food service perceptions of the athletes. The questionnaires used for the determination of the nutrition knowledge and food service perceptions were adapted from Rosenbloom<sup>7</sup> and Capra<sup>3</sup> respectively. Statistical Package for Social Sciences (SPSS) version 17 was used to analyse the data collected.

## **Results**

A total of 110 athletes from 19 types of sports, which were categorised as aesthetic and non-aesthetic sports, were recruited for the study. There was an unequal distribution of sex among the respondents where the percentage of male respondents (63.6%) surmounted female respondents (36.4%). For ethnic distribution, majority of the respondents were Malays (60%) followed by Chinese respondents (28.2%). The majority of them (52.7%) had completed their secondary school education and those involved in non-aesthetic sports (67.3%) outnumbered those in aesthetic sports (32.7%).

Results indicated that the respondents were most satisfied with the meal service quality dimension (mean score  $4.13 \pm 0.72$ ) while least satisfied with the food quality dimension (mean score  $3.77 \pm 0.75$ ). All dimensions were significantly correlated with the overall satisfaction with the foodservices (Table 1).

**Table 1: Correlation between mean scores of food service dimensions and overall satisfaction among the respondents**

Food service dimensions	Mean score	Overall satisfaction	
		r	p-value
Food quality	3.77 ± 0.75	0.719*	0.000
Meal service quality	4.13 ± 0.72	0.599*	0.000
Staff/service issues	4.05 ± 0.84	0.514*	0.000
Dining environment	4.08 ± 0.78	0.681*	0.000

\* Correlation is significant at the 0.001 level (2-tailed)

No significant differences in food service perceptions were found between the athletes from different socio-demographic backgrounds ( $p > 0.05$ ) and aesthetic and non-aesthetic sport disciplines ( $p > 0.05$ ). Significant differences as shown in Table 2 in nutrition knowledge were observed among the athletes from different ethnic groups and educational levels where the Chinese athletes appeared to have higher nutrition knowledge than their Malay counterparts ( $p < 0.01$ ), while the athletes with tertiary education were found to have higher nutrition knowledge than the athletes with secondary school education ( $p < 0.05$ ). On the other hand, no significant relationship was found between the athletes' nutrition knowledge and their food service perceptions ( $r = -0.015$ ,  $p > 0.05$ ).

## Discussion

All of the food service dimensions influenced the overall satisfaction of the respondents. The high ratings on the meal service quality dimension indicated that the foodservice staffs were doing a great job where the conditions of crockery and cutlery, the temperature of foods and beverages, the arrangement of the buffet and the use of food tags were being taken care of. Notwithstanding, the lower ratings in the food quality dimension called for greater concern as the lower satisfaction level in this dimension might be the key issue explaining why some athletes chose not to dine in the cafeteria, since food quality appeared to be strongly related to the overall satisfaction. The results also implied that satisfaction with the foodservices was not influenced by athlete's sport

classification. As athletes involved in aesthetic sports have a relatively higher need to maintain their body shapes or maintain their weight, higher nutrition mean score was expected. However, the difference between the mean nutrition knowledge scores was not statistically significant ( $p > 0.05$ ). The Chinese athletes had higher nutrition score compared to the other races. These results were in accord with the researcher's expectation as most of the Malay respondents (66.7%) had only completed their secondary school education whilst the majority of the Chinese respondents (61.3%) had completed tertiary education.

**Table 2: Mean nutrition knowledge scores of respondents according to socio-demographic characteristics**

Characteristics	No. of subjects	Mean score $\pm$ Standard deviation	P-value
Sex			
Male	70	6.23 $\pm$ 1.75	0.893 <sup>a</sup>
Female	40	6.28 $\pm$ 1.74	
Race			
Malay	66	5.88 $\pm$ 1.46	0.004**
Chinese	31	7.16 $\pm$ 1.92	
Indian	6	5.50 $\pm$ 1.76	
Others	7	6.29 $\pm$ 2.06	
Education level			
Secondary school	58	5.90 $\pm$ 1.60	0.028*
Diploma/certificate	14	6.43 $\pm$ 1.28	
University	28	7.04 $\pm$ 1.99	
Sport classification			
Aesthetic	36	6.25 $\pm$ 1.78	0.985
Non-aesthetic	74	6.24 $\pm$ 1.73	

\*\*  $p < 0.01$ , \*  $p < 0.05$ , one-way ANOVA; <sup>a</sup> independent t-test



## Conclusion

Results obtained suggested that all of the athletes, regardless of their socio-demographic backgrounds and sport disciplines, need to be targeted for nutrition education to assist them in making proper dietary decisions. The results also implied that most of the athletes were still having misconceptions about the roles of certain nutrients in sports performance. If foods are chosen based on these misconceptions, various negative consequences can be expected to befall on our athletes. However, nutrition knowledge did not influence their perception of the foodservices.

In order to improve the overall food service satisfaction among the athletes, the Food Service Unit ought to focus on the enhancements of the dimensions of food quality and staff/service issues. The lower ratings in the food quality dimension called for greater concern as the lower satisfaction level in this dimension might be the key issue explaining why some athletes choose not to dine in the cafeteria, since food quality appeared to be the principal predictor of the overall satisfaction. The Food Service Unit need to carry out a food quality rating survey to determine the factors that lead to dissatisfaction with the food served.

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## **Development of food services in Poland**

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**Keywords: food service industry, catering services, development trends, Poland**

### **Abstract**

The paper presents the development of food services in Poland with special attention to new concepts and trends. Despite the decreasing number of catering establishments, as a result of the economic crisis, the sector is growing and attracting new investments. During the period 2004-2008 the compound annual growth rate equalled 4.1%, with \$3.8 billion of total revenues in 2008. Cafes and restaurants constitute the most lucrative segment, generating almost 60% of the sector's aggregate values. Although the food service industry is expected to develop slower until 2013, good future perspectives are foreseen. The best prognoses are linked to casual restaurants, cafes, and fast food restaurants operating in networks on the basis of franchises. Analysts forecast further expansion of catering facilities in shopping malls, city centres, high streets and important communication routes.

### **Introduction**

In Poland during the last 20 years, the conditions of food preparation and consumption have changed significantly. At present, more and more frequently we eat at a time and place that we find convenient i.e.: at home, in a restaurant, canteen etc., or at a place "on our way". It is worth mentioning that nowadays foodstuffs and ready-made meals are available 24 hours per day. Increase of population wealth and changes in eating habits and lifestyle create a great opportunity and challenge for the development of a wide range of food services.

### **Methods**

The aim of this paper is to analyse the current situation of food services in Poland and its development perspectives. The paper uses secondary sources of information such as statistical data of the Central Statistical Office (CSO),

business reports, and industry newsletters and publications. A comparative method was applied for the analysis of collected data and materials.

## Results

The share of Poland in overall value of the European food service accounts for 1.6%. Russia, Czech Republic and Hungary generate a further 2.0%, 0.8% and 0.6% respectively of the regional revenues. This means that 95% of overall value belongs to the “Rest of Europe”<sup>1</sup>. In 2008, the Polish food service industry generated total revenues of \$3.8 billion representing a compound annual growth rate (CAGR) of 4.1% for the period spanning 2004-2008. In comparison, the Russian and Czech industry grew with CAGR of 7% and 3.8% respectively, over the same period to reach respective values of \$6 billion and \$2.3 billion in 2008<sup>2</sup>.

**Table 1. Poland foodservice industry value, \$ billion, 2004-2008**

<b>Year</b>	<b>\$ billion</b>	<b>% growth</b>
2004	3.3	-
2005	3.4	3.30
2006	3.5	3.30
2007	3.7	5.10
2008	3.8	4.80
CAGR, 2004-2008		4.10

Source: Food service in Poland, 2009<sup>2</sup>

The food service industry consists of four segments:

- Cafe & Restaurants (cafes, pubs & bars, full service restaurants, hotel and retail locations)
- Fast food (quick service restaurants, takeaways, street vendors and leisure locations incl. cinemas, theatres etc.)
- Other (nightclubs and sales onboard boats, planes, trains or coaches)
- Cost (work and education places, hospitals, welfare & services locations).

The first three segments are a part of profit foodservice.

According to the last data<sup>2</sup> the Cafe and Restaurants' segment with total revenues of \$2.3 billion in 2008 leads the Polish foodservice industry, accounting for 59.2% of the industry's overall value. The second position – revenues of \$1.1 billion - belongs to the cost foodservice segment with 28% share. The fast food segment comprises 10.1% of market share and remaining (“other”) – 2.7%. The performance of the food service industry is forecasted to decelerate, with an anticipated compound annual growth rate of 3.8% for the five-year period 2008-2013, which is expected to drive the industry to a value of \$4.6 billion by the end of 2013<sup>2</sup>.

The general development of food services results mainly from changes in eating habits and the lifestyle of contemporary consumers. Changes in needs are strongly determined by consumers' interests in the areas of health and well-being, convenience and safety. According to research<sup>3</sup> lifestyle trends are linked to the facts that traditional families are no longer the standard, work is becoming more dominant in the weekly schedule and income increases along with it. In general life is more demanding (and stressful) and personal health and safety are very important. As cooking skills diminish, less time is spent on preparing and consuming meals, more on travel and work. Consumers need convenience and the feeling of being in control, their daily schedules are more individual and less flexible, and they want support in healthy diet and long for traditional food with today's service.

### **Catering sector on the base of national statistics**

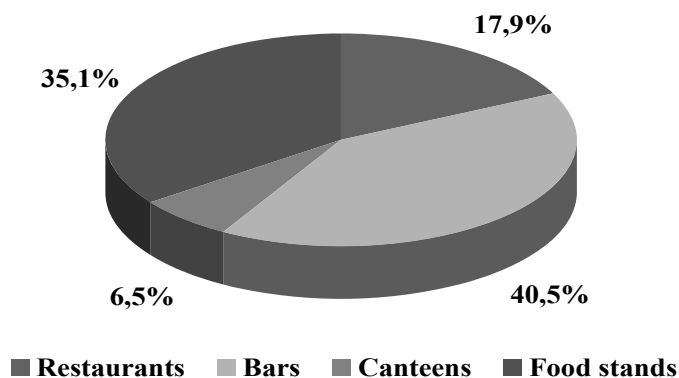
According to CSO data, in 2009 there were as many as 78.6 thousand restaurant outlets, compared to 92 thousand in 2005 and 81.1 thousand in 2008 in Poland (Table. 3).

**Table 3. Number of catering establishments, 2000-2009**

	2000	2005	2009	2000-2009 % change
Restaurants	8519	9716	14120	65.7
Bars	36436	40834	31828	-12.7
Canteens	7010	6950	5107	-27.2
Food stands	32377	34572	27569	-14.8
TOTAL	84342	92072	78624	-6.8
Sector:				
-public	3320	2398	1616	-51.3
-private	81022	89674	77008	-5.0

Source: Statistical Yearbook, 2010<sup>4</sup>

The decreasing number of catering establishments (excluding restaurants) proves that the economic crisis was also observed in the described sector. Almost 55% of the total number of catering enterprises reported a decrease in sales, 20% - an increase and 24% did not notice any changes (9). At present most restaurant outlets, approximately 98%, are privately owned. The catering outlet structure is dominated by bars and eating facilities – food stands (75.6% of the total number). The second largest group consists of restaurants (17.9%) while canteens comprise 6.5% (Figure. 1).

**Figure 1. Catering establishments structure, 2009**

Source: Statistical Yearbook, 2010<sup>4</sup>

Bars and similar eating facilities usually belong to the category of fast food. They became popular among consumers due to three features: narrow range of typical meals e.g. hamburgers, pizza, Mexican food, Asian food; lower prices and self service – fast and time-saving. It should also be underlined that the segment is evolving towards the so-called fast casual or towards more sophisticated forms responding to appeals and actions focused on improving lifestyle and life quality, which includes eating. A major element that facilitates such solutions is the systematically growing revenue. The revenue of catering establishments is generated mainly by own food production, followed by alcohol and tobacco sales. It is important to stress that the revenue generated by own food production has been rapidly increasing. In 2009, own production generated 65.6% of total restaurants' revenue; sales of goods including alcohol and tobacco generated 31.7% of the income. Only 2.7% of the revenue was generated by other economic activities. When we compare the data to year 1995, the revenue generated by particular categories looks as follows: 44.7%, 38.1%, and 2.1%, respectively. In the European reporting, household expenditures on meals in restaurants and hotels are presented together. The share of the Polish household expenditures equalled 1.4 % in 2000 and increased to 2.3% in 2009, that indicates very low level in comparison to other countries (e.g. Spain over 18%, Greece about 16%). The expenditures on catering services depend – among others - on family size. The highest share – almost 13% is noticed in one-person households, the lowest in multi-person households. On average about 7.5% of monthly expenditures of households is located in catering services. The highest share – over 11% - characterize self-employed, the lowest farmers' families – 2.3%<sup>6</sup>.

**Table 4. Average monthly expenditures share on catering services by number of persons in households, 2009**

Share of monthly expenditures on food and non alcoholic beverages in catering	Number of persons in household					
	One	Two	Three	Four	Five	Six
	12,6	7,1	7,7	6,7	5,7	4,1

Source: Household budgets surveys, 2010<sup>6</sup>

### Development trends in the catering sector

When describing Polish restaurant outlets, one should mention the fact that the number of restaurant networks is growing every year. Many Polish restaurant owners decide to open more restaurants if their first restaurant turns out to be a success. They have similar designs and menu. However, only a few, such as Sphinx, Dominium Pizza, Da Grasso managed to become nationwide. Usually, Polish restaurant networks operate on a regional level. Top businesses belong to a brand with foreign capital, Mc Donald's being the leader. It is estimated that over 2000 restaurant outlets are a part of a network and develop their operations on the basis of franchising. Out of 20 largest restaurant networks, 13 are businesses with Polish capital. In 2008, the share of the market held by network restaurants in particular market segments was as follows: coffee shops – 31%, fast food – 23%, fast casual- 23%, casual dining – 15%, fine dining – 5%, and pubs/bars – 3%. The network which has the biggest number of franchisees in Poland is Fornetti (250 mini bakery shops), Da Grasso (180 pizzerias), McDonald's (100 restaurants), TelePizza (60 businesses), and Cafe Nescafe (40 businesses). In 2009 the number of franchisors operating in Poland increased to 90. The future of the food service franchise in Poland looks optimistic, due to the following aspects:

- Growing popularity of franchise as a safe way to run a restaurant;
- Growing interest in the Polish market voiced by foreign networks;
- Increase of shopping centres with room for restaurants;
- Relatively big market fragmentation, and lack of diversity.

Research carried out in 2008 among managerial staff of 57 networks of restaurants, cafes and bars operating in Poland showed that the most popular locations of catering networks establishments are shopping malls, city centers, high streets and important communication routes<sup>7</sup>. The biggest competition was identified among cafes (incl. Coffeheaven, Costa Coffee, Café Nescafe and W Biegu Café) and pizzerias (such as Telepizza, Da Grasso, Pizza Hut and Dominum). The best perspectives for development were linked to casual restaurants (41% of respondents), cafes (41%) and fast food restaurants (38%). The most important factors that will influence further development of the food service sector are: increase of wages (population wealth), changes in food consumption habits, marketing activities and increasing number of loyal consumers. The companies also saw opportunities related to the development of tourism and organization of European Football Championships in 2012. It is interesting to notice that catering networks often choose to locate their establishments in the area of petrol stations. For example McDonald's has 63 such restaurants, of which 21 are on BP stations, 15 – Shell, 10 – Statoil<sup>8</sup>. On more than 800 petrol stations in Poland drivers can eat snacks, such as hot dogs, toasts, tortillas, sandwiches. For example, BP opened Wild Bean Cafes on c. 200



of its stations, Shell is preparing to implement its catering brand “Deli 2go” on c. 300 of its company owned stations in Poland after successfully introducing it in other European countries (Table 5). Another example is the Lotos group, a totally state-owned company, which has undersigned a contract with the network Polskie Jadło and will sell Polish traditional foods (pirogis in carton boxes) on selected stations<sup>9</sup>.

**Table 5. Branded food service facilities at petrol stations in Poland**

Petrol concern	Own catering brand	Number of catering facilities	Number of McDonald's restaurants
Orlen	Stop Café	420	4
	Stop Café Bistro	200	
BP	Wild Bean Cafe	200	21
Shell	Deli2go	Plans to introduce in circa 300 stations	15
Lotos	Polskie Jadło	No data	7

Source: Nowy project Orlenu i Lotosu. Franchising. 2010<sup>9</sup> and own research.

It must be noted that the biggest increase has taken place on petrol stations owned by PKN Orlen, which is a Polish state-owned company and one of Central Europe's largest refiners of crude oil. The first catering facilities under the brand “Café Stop Bistros”, offering hot drinks, cakes and sandwiches were opened in late January 2008. At the end of 2008 there were 409 Stop Café “corners” and 26 Stop Café Bistros, with an expanded offer incl. ciabattas and warm toasts directly from the oven. In September 2010 the total number of these facilities in Poland increased to 618. Currently these outlets are present only on PKN Orlen company-owned stations, however the company is investigating the possibility of making the brand available to franchisees<sup>9</sup>. The brand has also been introduced in Lithuania and the Czech Republic. It focuses on the market segment of car users, who expect high quality products and service as well convenience. The brand is positioned as a place offering prime coffee, made from the best quality beans. The coffee sold in Stop Café has the Fair Trade certificate, which means that the coffee suppliers participate in the initiative aimed at reducing exploitation of coffee planters. The ambassadors of the Stop

Café brand are Polish sport champions and famous Olympic medalists, such as Tomasz Majewski and Anita Włodarczyk. The Stop Café logo and visualization of coffee is on the sportswear of handball player team Orlen Wisła Płock. This form of sports marketing has been used in Poland for the first time<sup>10</sup>.

Another example of dynamically developing business activities in the catering sector are catering services. They are usually classified in three categories:

- contract catering (services provided to customers on spot/at their work place, or at food ticket network)
- commercial catering
- air transportation catering.

The companies that play an important role in the segment are both world leaders such as SODEXO, EUREST and Polish companies i.e. LOT Catering, which specializes in transportation catering. The company owns the largest manufacturing catering plant in Poland of the surface 13.5 thousands of sq. meters. It is worth noting that companies from this sector are diversifying their activities. In the case of SODEXO it is: facilities management such as technical maintenance, reception, outsourcing, administration support, project management, cleaning, security coordination. LOT Catering in the last few years has been widening its profile by adding to main activities contract and commercial activities. Commercial catering has a major market potential due to widespread western business customs and improving economical status of Polish people who more frequently organise family and friends' gatherings outside the home. It should be underlined that apart from quantitative changes in the Polish catering business, there are also qualitative changes going on. They include better interior design, equipment standard, more interesting food offer, and better service. An interesting thing is that since Poles cherish traditional and regional cuisine dishes, these are more and more often included in the menu.

### **Conclusions**

In the nearest future, taking into consideration foreseen economic growth and improved financial standing of Polish households, there will be a significant increase in the demand for the catering services. Consequently, the income of the businesses in the industry will grow facilitating new investments and upgrading. The first to benefit will be “casual dining” restaurants, which bridge the gap between cheap fast food outlets and expensive restaurants. Network restaurants as well as petrol station branded eating facilities are expected to gain importance too. Shopping malls will continue to be a very popular place for eating and their growth will be especially fast. They can accommodate between a couple and a few dozen eating outlets with a very diverse offering. Due to an increased interest in “healthy” and functional food, it is expected that the places

which offer vegetarian food, low fat food, and diet food (e.g. low in salt) will become more and more popular. Apart from a growing number of eating outlets there will be more acquisitions and capital consolidation. All the industry activities will be aimed at satisfying the evolving needs of consumers who not only expect, but also demand the highest quality services. An additional stimulus for the food services industry is the fact that Poland and Ukraine will host the European Football Championships in 2012.

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# **The influence of morning snacks composition on lunchtime behaviour at public Portuguese elementary schools**

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**Keywords: school snacks, lunch, children, daily nutritional intake**

## **Abstract**

**Objective:** Evaluate the influence of morning snacks composition on lunchtime behaviour at Public Portuguese Elementary Schools and Kindergartens in the Municipality of S. João da Madeira.

**Methods:** The sample comprised 176 pupils aged from 3 to 9 years who had lunch on the day of data collection at the school canteen. This sectional descriptive study consisted in an indirect questionnaire, a satisfaction survey to students about the meal provided at the school canteen and photographs of school snacks. Statistical analysis was performed using Statistical Package for Social Sciences (SPSS)<sup>®</sup> and the Microsoft Office Excel 2003<sup>®</sup>.

**Results:** 98.9% of children had snacks available for consumption during the inquiry day. 88.1% consumed the whole meal at the school canteen. The most prevalent leftovers were vegetables.

**Conclusion:** Although no significant associations were found between composition of morning snacks and acceptance of lunch, several unhealthy food habits were identified pointing to the need of food educational programs aiming to promote healthy eating and disease prevention during childhood. Special attention should be paid to parental awareness about health risks resulting from inadequate consumption of food.

## **Introduction**

Healthy eating habits are crucial during childhood, playing an important role in the development and growth of children. As the number of children eating at schools and kindergarten has been rising in the last years, food units attain an increasing responsibility for children's wellbeing<sup>1</sup>. The morning snack is crucial to balance the daily intake<sup>2,3</sup>, providing energy and nutrients between meals. Snacks brought by children to school usually do not meet nutritional guidelines corresponding to highly energetic meals<sup>4,5</sup>.

Schools and kindergartens play an important role in children's nutritional education and consumption. The school canteen has the responsibility of providing healthy meals, helping to meet the nutritional needs and promoting healthy eating habits<sup>6</sup>. Besides that it is necessary to control the composition of midmorning snacks avoiding interference with lunch acceptance.

### **Aim**

The aim of this research is to evaluate the influence of composition of morning snacks on lunchtime behaviour at a Public Portuguese Elementary Schools and Kindergarten from a Portuguese Municipality.

### **Material and methods**

A cross sectional study was developed by applying an indirect food questionnaire, a questionnaire of satisfaction with school lunch and characterization of morning snacks available for consumption by collecting pictures

The sample included 10% of the students from public kindergarten and elementary schools of this municipality in the school year of 2009/2010, aging from 3 to 9 years and that had lunch at school canteen on the day of data collection. Confidentiality was assured. The designation of 'consumed' was used in data description for groups of foods available for consumption. The school social classification according to family income was taken into account and compared to meal support by school<sup>7</sup>. Stages: A → 100% of meal support; B - 50% of meal support; C – no meal support.

Foods were grouped according to the "EpiPorto – Food Consumption in Porto"<sup>8</sup>.

Quantitative evaluation of the lunch was made by weighing the main dish and soup of the respondent at the beginning and at the end of the meal.

Statistical analysis of data was developed using Statistical Package for the Social Sciences version 17<sup>®</sup> and Microsoft Office Excel 2003<sup>®</sup>.

### **Results**

The sample comprised 176 children aged from 3 to 9 years old. The distribution of the students by gender and level of education was equivalent. 98.9% had a snack available for consumption during the survey. 90.8% of these were prepared at home, while 7.5% had completed the snack with school milk (Table 1). The snack of 88.5% children was prepared by their parents at home (Table 2).

**Table 1. Origin of the snack**

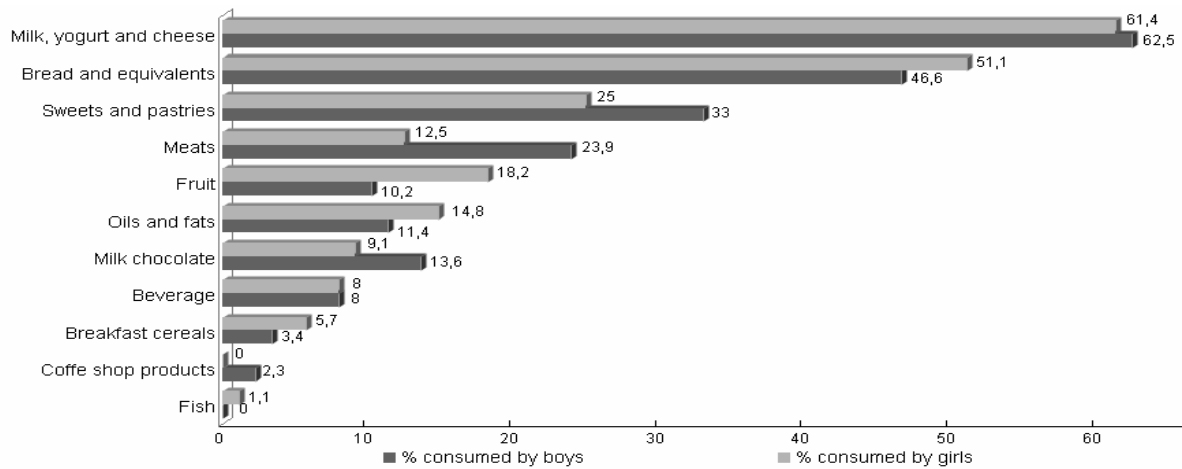
		Origin of the Snack				
		Home	Home + school	Home + Snack bar	Snack bar	School
N		158	13	1	1	1
(%)		(90,8)	(7,5)	(0,6)	(0,6)	(0,6)
Gender		♂ 97,7	♂ 7	♂ 1,2	♀ 1,2	♂ 1,2
(%)		♀ 98,9	♀ 8			

**Table 2. The person who prepares the snack**

		Snack Preparation				
		Own	Parents	Grandparents	Babysitter/maid	Other
N		9	154	3	2	6
(%)		(5,2)	(88,5)	(1,7)	(1,1)	(3,4)
Gender		♂ 4,7	♂ 89,5	♂ 1,2	♂ 1,2	♂ 3,5
(%)		♀ 5,7	♀ 87,6	♀ 2,3	♀ 1,1	♀ 3,4

It was found that the group of milk, yogurt and cheese (61.9%) and the group of bread and equivalents (48.9%) were the most consumed. Milk, yogurt and cheese, as well as sweets and pastries, meats, milk chocolate and coffee shop products were more consumed by boys. The bread and equivalents, fruit, breakfast cereals, oils and fats were more consumed by girls (Figure 1).

**Figure 1: Distribution of food groups consumed at morning snacks by gender (%)**



A statistically significant relationship was found between chocolate milk consumption and age ( $\rho = 0.003$ ). A greater availability of beverages at snacks prepared at home was observed. The availability of chocolate milk was higher when snacks were completed at school. Most children consumed two food groups (38.1%) at midmorning snacks. It was found that 32.9% of girls and 38.1% of boys consumed three or more food groups during morning snacks. No statistically significant relationships were found between the number of food groups and gender ( $\rho=0.543$ ), however there was an increase in the number of food groups with age ( $\rho=0.024$ ,  $r= 0.17$ ).

The total energetic value (VET) of morning snacks was 255.3 kcal. Protein contributed, on average, with 13.0%, lipids with 25.6% and carbohydrates with 61.4% (54.3% corresponding to simple sugars) to the VET of snacks (Table 3).

**Table 3. Energetic and nutritional contribution of the average school lunch to the daily intake**

	Average	Standard deviation	Minimum	Maximum
Energy (kcal)	255,3	114,8	52,0	712,8
Protein (g)	8,3	7,5	0,3	68,6
Fat (g)	7,3	5,9	0,1	39,6
Carbohydrates (g)	39,2	16,8	6,3	100,7
Simple Sugars (g)	34,7	17,5	0,4	103,3
Dietary fiber (g)	1,8	1,4	0,0	7,9

Significant differences on the amount of fat consumed, were found between genders ( $\rho = 0.035$ ): girls eat less fat (6.4 g) than boys (8.2 g). It was also observed that boys presented snacks with higher VET, higher amounts of protein, carbohydrates and simple sugars and lower dietary fibre content than girls, nevertheless differences were not significant (Table 4).

**Table 4. Distribution of value of total energy, macronutrients and dietary fibre by gender**

	Gender		$\rho^*$
	Boys (%)	Girls (%)	
Energy (kcal)	268,7	242,2	0,148
Protein (g)	9,1	7,5	0,154
Fat (g)	8,2	6,4	<b>0,035</b>
Carbohydrates (g)	39,9	38,5	0,597
Simple Sugars (g)	35,2	34,3	0,874
Dietary fiber (g)	1,8	1,8	0,564

\* $\rho$  value: significance level

There were significant associations between age and total energy ( $\rho < 0.001$ ;  $r_s = 0.291$ ), fat ( $\rho = 0.003$ ,  $r = 0.221$ ), carbohydrates ( $\rho < 0.001$ ;  $r_s = 0.264$ ) and simple sugars ( $\rho = 0.015$ ,  $r_s = 0.185$ ), indicating that older children consumed higher intakes of energy and macronutrients, as expected (Table 5).

**Table 5. Distribution of value of total energy, macronutrients and dietary fibre by age**

	Age							$\rho^*$
	3	4	5	6	7	8	9	
Energy (kcal)	201,0	227,4	213,3	262,1	253,1	253,9	326,4	<b>&lt;0,001</b> ( $r_s=0,291$ )
Protein (g)	7,3	6,9	8,3	7,2	9,3	8,0	10,3	0,127 ( $r=0,116$ )
Fat (g)	4,1	6,3	6,0	8,5	6,9	6,8	10,2	<b>0,003</b> ( $r=0,221$ )
Carbohydrates (g)	32,6	35,5	33,6	38,4	40,2	40,7	47,3	<b>&lt;0,001</b> ( $r_s=0,264$ )
Simple Sugars (g)	32,8	31,5	32,3	30,3	37,6	33,9	42,1	<b>0,015</b> ( $r_s=0,185$ )
Dietary fiber (g)	1,5	1,7	1,9	1,7	1,9	1,8	2,1	0,146 ( $r_s=0,111$ )

\* $\rho$  value: significance level;  $r$ : Pearson correlation;  $r_s$ : Spearman correlation



It was found that snacks prepared at home contributed significantly to the high levels of macronutrients. There were no significant differences in VET and nutrient composition of snacks depending on the person who prepared them. The highest intake of School chocolate Milk Lactogal<sup>®</sup> was identified in the afternoon (62%). The consumption of this item was independent of gender ( $\rho = 0.243$ ).

It was found that students with no meal support (stage C) showed lower energy (238.5 kcal;  $\rho = 0.005$ ) and fat intakes (6.5 g,  $\rho = 0.039$ ), compared to those from lower economic status (Table 6).

**Table 6. Value of total energy, macronutrients and dietary fibre according to the level of social action**

	Economic status						$\rho^*$
	A (green)		B (blue)		C (rose)		
	Average	Standard deviation	Average	Standard deviation	Average	Standard deviation	
<b>Energy (kcal)</b>	279,6	114,1	306,0	101,6	238,5	114,2	<b>0,005</b>
<b>Protein (g)</b>	9,7	12,0	10,0	5,4	7,6	6,2	0,178
<b>Fat (g)</b>	9,1	7,8	8,7	5,3	6,5	5,3	<b>0,039</b>
<b>Carbohydrates (g)</b>	40,3	12,1	44,2	14,9	37,9	18,0	0,087
<b>Simple Sugars (g)</b>	36,2	16,3	38,5	16,6	33,5	17,9	0,275
<b>Dietary fiber (g)</b>	1,8	1,4	1,7	1,5	1,8	1,4	0,702

\*p value: significance level

In general the majority of children had lunch at the canteen 5 times per week. It was observed that the meal was almost entirely consumed (88.1%), however it appears that female intake was slightly lower than the male one (Table 7).

**Table 7. Lunch intake by gender**

	Males	Females	$\rho^*$
<b>Total ingested meal (%)</b>	90,3 ± 8,96	85,8±12,59	<b>0,008</b>
<i>Mean</i>	88,09 ± 11,12		
	(min.=46,08; max.=100,00)		

\*p value: significance level

The food remaining left on plates, was influenced by the daily menu, corresponding mostly to vegetables or salads (59.1%). However, 54.5% of leftovers were pasta, rice or potatoes, and 32.8% was meat and fish. Approximately 14% of the students did not eat beans. No statistically significant difference was observed between lunch leftovers and snack energy contribution ( $\rho= 0.382$ ).

## Discussion

Mid-day meals, particularly morning snacks, are essential for balancing the daily intake<sup>1,2</sup>. It was found that 98.9% of children surveyed had at least one food available for consumption at mid-morning snack. The group of milk, yogurt and cheese prevailed, together with bread and equivalents, similar results were found in other studies at other Portuguese municipalities, such as Olhão<sup>8</sup> and Matosinhos<sup>9</sup>.

The group of sweets and pastries occupies the 3rd position of the most consumed items and were preferred by boys. 25 to 33% of children consumed sweets on the day of the data collection, consumption of fruit is relatively low, although it was higher in female gender. According to the study of Lorson et al., boys drink more fruit juices and eat less fruit than girls, additionally younger children showed the highest intakes<sup>10</sup>, as found in our study. Several studies have shown that children do not meet recommendations for fruit intake<sup>10,12</sup>. There is a growing tendency for consuming soft drinks and juices instead of fresh fruit<sup>12</sup>.

According to Nago et al., the best criterion to define the quality of food and its health implications is its origin and preparation<sup>15</sup>. In this study, although the majority of snacks were prepared at home by parents, there was no positive influence on the quality of snacks. According to the study of Rees et al. 2008, the meals from home have higher energetic value and higher amount of carbohydrates, including simple sugars<sup>11</sup>. In this study the group of sweets and pastries appeared more frequently than fruits, and snacks prepared at home also had more sweet drinks.

To meet nutritional needs, the total daily energy intake should be divided into several small meals throughout the day<sup>12</sup>. It was found that the average energetic value of morning snacks was 255.3 kcal. The contribution to the VET was approximately 19% according to the Estimated Energy Requirement<sup>13,16</sup> (EER estimated by sex, age and physical activity) much higher than the recommended contribute of 10%<sup>16</sup>. The group of cafeteria food and “fast food” contributed significantly to the high caloric value of snacks.

Young people from socioeconomically disadvantaged families and less educated tend to have more unhealthy diets<sup>17,18</sup>. Similar findings were found in this study.

No relationship was found between high energetic mid morning snacks and acceptance / consumption of lunch at the school canteen.

Despite the important role of vegetables for health<sup>19</sup>, it was noticed that consumption was relatively low. The majority of children did not eat this food group, a result consistent with other studies<sup>11,20</sup>.

## **Conclusion**

Although no significant associations were found between composition of morning snacks and acceptance of lunch, several unhealthy food habits were identified pointing to the need of food educational programs aiming to promote healthy eating and disease prevention during childhood. As no positive influence of parents on the composition of snacks was observed these programs must involve the whole community and must pay special attention to parental awareness about health risks resulting from inadequate consumption of food.

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## **The 4M model of the meal experience**

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**Keywords: meal experience, modelling, foodservice management**

### **Abstract**

The objective of this paper is to revisit research proposing a modified model of the meal experience consisting of four meta-constructs: moment, mood, meal, and money. It is suggested that research into the meal experience must proceed from some agreed template that incorporates greater explicitness in assumptions underlying the modelling process, and an orientation toward the construction of measurable meta-constructs and sub-meta-constructs.

### **Introduction**

This paper reports conceptual research into creation of a new model of the meal experience. The concept of the meal experience was developed by Campbell-Smith<sup>1</sup> whose premise was that when dining out the customer assessed their overall experience not only by reference to the quality of food and drink but also to elements such as quality of service and ambience of the restaurant. The meal experience remains a key concept in hospitality management because it implies that commercial hospitality providers can manipulate the elements within it to influence customers' reactions to the kind and nature of provision.

In a review of the concept, Johns, Tyas, Ingold and Hopkinson wrote: 'It is generally held that the 'product' of a foodservice outlet is a 'meal experience' consisting (like other hospitality 'products') of an amalgam of tangible and intangible components'... [...] Authors have identified three broad categories of factors which make up the meal experience: those concerned with customer traits and preferences, those which are directly important in terms of managing a foodservice outlet, and those which seem intuitively to be attributes or benefits of eating outside the home'.<sup>2</sup>

### **Research into the meal experience**

Early research into the meal experience was somewhat piecemeal and inconclusive in nature. A review of key studies (Lewis<sup>3</sup>; June and Smith<sup>4</sup>; Auty<sup>5</sup>;

Harris and West<sup>6</sup>; Clark and Wood<sup>7</sup>; Warde and Martens<sup>8</sup>; Yamanaka, Almanza, Nelson and De Vaney<sup>9</sup>; Myung, McCool and Feinstein<sup>10</sup>) reveals a range of 'most important factors' in the meal experience including liquor, food quality, food type; service, range of food, company and the conversation, and price suggesting that Johns et al.<sup>11</sup> were correct to point out that 'it was impossible to identify clearly the factors which make up the meal experience'. More recently, there has been a more systematic interest in the 'five aspects meal model' or FAMM (e.g. Andersson and Mossberg<sup>12</sup>; Carlbäck<sup>13</sup>; Edwards and Gustafsson<sup>14</sup>; Gustafsson, Öström, Johansson, and Mossberg<sup>15</sup>; Meiselman<sup>16</sup>; Nyberg and Grindland<sup>17</sup>; Öström, Rapp, and Prim<sup>18</sup>) originally articulated by Gustafsson<sup>19</sup>. The FAMM model is 'a tool for understanding and handling the different aspects involved in producing commercial meals and offering guests the best possible meal experience' (Gustafsson et al.<sup>20</sup>). The FAMM model of the meal experience focuses on four core elements. Within an inner circle are three core elements – room, meeting and product – encompassed within a second, the area between their boundaries representing the management control system of the business providing the meal. In turn, this circle is enclosed within a third, the space between its boundaries and that of the second circle representing 'atmosphere'. The room represents the physical setting of the meal; the meeting constitutes the interpersonal relations between diners and other diners and personnel; the product is the gastronomic blending of food and drink; and the management control system includes administrative (economic, legal and technical) aspects of delivering the meal experience. The final element – atmosphere – is 'radiated' by interaction of the other variables.

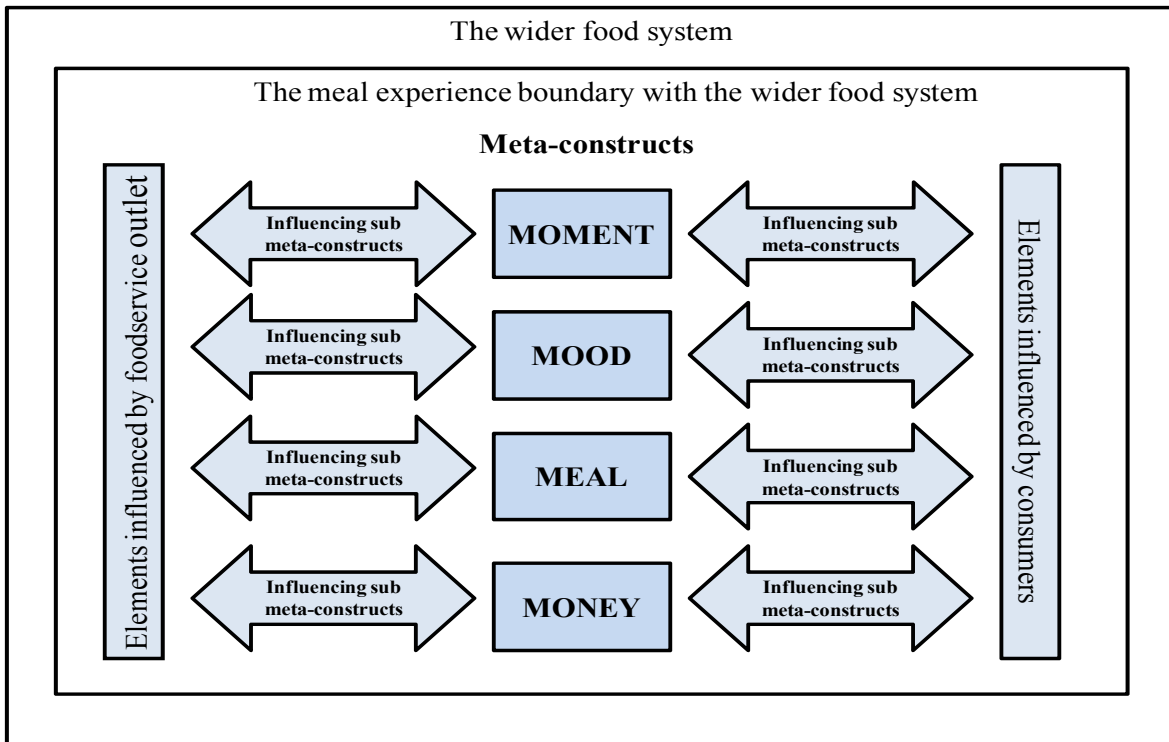
The FAMM approach represents the most promising attempt yet to systematically analyze the meal experience, but shares with other models certain generic limitations. First, in all models the meal experience concept is represented as static. Factors that go to make up the meal experience are treated as discrete variables that do not change as other variables change (for example, changes can take place in perception of food quality depending on the length of time a guest has to wait for the service of the food). Secondly, these factors are themselves, in all models of the meal experience, divisible constructs, usually consisting of a number of different elements. For example, to speak of the role of the 'room' in the meal experience is to invoke multiple variables that are themselves subject to constant temporal change. Thirdly, extant models of the meal experience tend to underrate the importance of those factors *external* to the food service outlet that influence expectations and ultimately (meal) experiences. This leads to the important distinction between dining out and eating out as captured, *inter alia*, by Pavesic<sup>21</sup> who argues that: 'Customers will evaluate a restaurant as a place to *eat-out* or as a place to *dine-out*. If a restaurant is considered an *eat-out* operation during the week (a substitute for cooking at home), customers will be more price conscious. If a restaurant is

considered a *dine-out* operation, the visit is regarded more as a social occasion or entertainment and price is not as much of a factor'.

### **The 4M model of the meal experience**

All modelling of phenomena involves a strong element of reductionist thinking and practice – one purpose of a model is to provide the manageable 'essence' of a phenomenon for study and analysis. In existing analyses of the meal experience it can be argued that the analytic constructs employed are too broad and unelaborated to be manageable. Necessary reductionism in the modelling process can to some extent be compensated for by seeking to generate meta-constructs and sub-meta-constructs that are broadly measurable. Thus, with a meta-construct like 'atmosphere' we must have at least one measurable sub-meta-construct (and in reality more than one) which is agreed to more or less accurately reflect the essence of the meta-construct. The provisionally entitled 4-M model of the meal experience is a work in progress being developed by one of the authors (Kivits). Originally conceived as the basis for a consumer decision model prior to any particular meal encounter or experience, it has as its conceptual core four broad meta-constructs – moment, mood, meal and money, acted upon by at least two sets of mutually reinforcing forces – those under the control of the foodservice outlet and those generated by the consumer (see Figure 1). For example, a foodservice provider may remove or add menu items because they do not sell, therefore the consumer's buying behaviour influences the provider's behaviour which in turn may influence the consumer's behaviour (it certainly will in one respect – the consumer will not be able to buy any dishes removed from the menu).

**Figure 1. The 4-M Meal Experience Model**



The four meta-constructs potentially subsume a great many sub-meta-constructs. In developing the 4-M model further, the intention is to examine whether the meta-constructs are valid in terms of the presumed sub-meta-constructs assigned to them (see Table 1).

Briefly explained, in this proposal, *moment* refers to the biological imperatives (hunger) and cultural conventions (habits, meal times) that influence the timing of food consumption. In this category might also be included social-psychological influences such as impulse. All are viewed as non-mutually exclusive. As the desire for food manifests itself then a consumer will 'benchmark' any developing decision-making process regarding consumption against biological, cultural and psychological factors relative to knowledge of the availability and location of food offerings.



**Table 1. Four meta-constructs and supposed example sub-meta-constructs**

<b>Meta-construct:</b>	<b>Moment</b>	<b>Mood</b>	<b>Meal</b>	<b>Money</b>
Example sub-meta-constructs	Availability	Alertness	Colour	Costs
	Awareness	Emotional state	Food quality	Price
	Habits	Stress	Service quality	Pricing methods
	Hunger	Tiredness	Taste	Income (guest)
	Impulse		Temperature	Income (supplier)
	Timing conventions		Texture	
			Value proposition	

In terms of *mood*, we know that for many people several mood states may be experienced during the course of any single day, again influenced by biology/physiology (alertness, tiredness, stress) and cultural, emotional and psychological forces. As Gardner<sup>22</sup> has noted, the influence of mood on consumer behaviour is far from completely clear but there are many suggestive elements including observations to the effect that the mood states of people in close proximity or contact with a consumer can influence the purchase and consumption behaviour of that person.

The *meal* in foodservice can mean many things to many people. It may consist of several courses or only one, it comprises food and (possibly) other factors besides, most notably service. In respect of food alone, there are many interacting elements such as taste, temperature, texture and colour to be considered in evaluating the consumption experience. All of these are likely to be conditioned into preferences by experience – for example a consumer does not like food which is too spicy, too hot, too tough or too colourful. Elements of the meal can influence, and be influenced by elements in other domains. For example, a person in a negative mood state may consume certain foodstuffs, typically sweet and/or fatty, for reasons of comfort.

*Money* refers to all those economic aspects of the meal experience including market economics, income, price and pricing methods (most common of which in the foodservice sector entails the use of cost based pricing) and financial costs. All of these vary to some degree according to the market(s) served and therefore give rise to various kinds of price differentiation within and between supplier segments.

## **Conclusion**

No claims are made for the superiority of the 4M model over others discussed in this paper. Rather, the objective is to focus on how modelling of the meal experience may be improved with an emphasis on establishing what, if any, sub-meta-constructs can reasonably be assumed to represent each meta-construct, thus facilitating application of the model in field studies with a view to macro-analysis. As an example, if price effectively represents the meal meta-construct and similar sub-meta-constructs can be identified for the remaining three domains (moment, mood and money) then it should be possible to create a simple, if crude model of potentially predictive utility that can be tested in the field. Increased competition in the foodservice sector is likely to ensure the continuing importance of the meal experience concept as a central plank of firms' marketing strategies.

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## **Food service in museums and galleries: Dreamscape spaces for extended contemplation of the beautiful and the sublime**

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**Keywords: tourism, leisure, cafés culture, spatial design**

### **Abstract**

Concerning tourist consumption, food purchasing is commonly regarded as a key purchase for those seeking a distinct, sensory experience. Suitably focused food service design promotes reflection upon the holiday environment's cultural differences, compared to that of the everyday, and many tourist domain food offerings can be seen to have been designed to amplify this effect. This culture-food service integration, however, has not been much studied relative to museum cafés, although museum and gallery visits also form a type of leisure 'break' from everyday surroundings within a culture-laden environment. This paper explores the ideal spatial design dimensions of various museums, art galleries and historic house relative to food service integration. It proposes theoretical design dimensions, characteristics and considerations for the spatial design of the foodservice offer, as divined from consumer narratives concerning the ideal holistic visit experience.

### **Methods: A southern county museum/gallery study**

The research was mainly focused around a sequential investigation into consumer/potential consumer research of a *qualitative* nature to gain local peoples' input into a four year planning and refurbishment project for a combined museum and art gallery on the south coast of England. Further details of the methodology can be found elsewhere<sup>1,2</sup> with only a summary of outline aspects here.

To frame the research a number of museum/gallery sector interviews were held with various management and staff of a number of Southern England museums and/or galleries as well as those involved in running the core operation under study. The major method of research thereafter was the holding of a number of local resident focus groups, mostly circa one hour in length featuring 39 respondents in total, in sessions of 4-8 respondents, including museum gallery

users and non-users across a wide socio-economic and life-stage span of adults, 25+. This process included a re-convened focus group process of 6-8 (average 7) heterogeneously selected respondents across three separate sessions. In addition there were four shorter group processes featuring around 24 students, aged 20-25. There was also a managed participant observed visit of one of the reconvened adult groups to a museum/gallery; the adult respondent outputs forming the main focus of the research. All groups were held in the county of Dorset, in and around the town of Bournemouth. Sessions included projective materials such as sentence completion, criteria/matrix ratings, psychodrawing/collages and other projective exercises used commonly in perception research<sup>3,4</sup>, as well as printed and projected stimulus slides and display materials from museum/gallery institution archives and works. The presentation of holistic findings, after full mechanical transcription, coding and analysis of all sessions, are hereby presented as key theoretical summaries developed throughout the research.

### **Results: Cafe spaces and their design parameters within a museum/gallery spatial mix**

Good cafés were found to be a key attraction and motivation for museum and gallery visitation, with a visit to the café seen as an extension of the duration of a visit to the core exhibition spaces, providing 'a cognitive break' during the potential intellectual stresses or 'wear-out' of a visit's self-educational purpose. The idea of a *cognitive break* from the everyday being formed by a taste-sensory experience is one that has also been found in generic 'snacking' research<sup>5</sup> – but, given the non-everyday experience of a museum/gallery visit in itself, here it effectively forms a break-within-a-break. Investigations into the café aspect of the museum and gallery visit, which also features museum retail<sup>6</sup> as well as core exhibit areas, proved fundamental in arriving at a summarising model for differential types of museum/gallery spaces and how they may work together during a visit's duration and activity mix. Café spaces were often described by participants over the course of the study as being desired to be 'cool' in the nature of their spatial design and experiential qualities. 'Cool' space was discussed as being sufficiently core-exhibit detached (non-objectified) and yet remaining hi-context (complimentary in features and generally lo-tech) in spatial nature relative to the overall visit intent, and therefore supportive of reflection upon it. The design of cafés to be suitable within the overall ambience (context) of the establishment - detached from the core learning spaces but allowing reflection upon them - was found to be a welcome adjunct to the overall museum/gallery experience, rather than providing an everyday café space. The description of 'coolness' was attributed directly by respondents as being

particularly relevant to the cafe or restaurant spaces (as well as to more reflective types of art gallery spaces).

In terms of building upon this temperature analogy, a matrix was designed for classifying the varieties of spatial types within the museum/gallery experience as in Figure 1. Further applications of the temperature analogy to spatial descriptions came from participants' representations of such spaces in drawings and conversations relative to temperate descriptors. The overall desired nature of a museum/gallery visit was more than just considering artistic or historic *objectification* of presented displays and then moving on; rather the visitors wished to be *subjectively* transported within a meaningful dreamscape connection to the objects and the spaces around them. This process included their desire to avoid boring or 'cold' exhibit spaces, expressed in terms of being of a 'glass case', hi-object nature and with high objectification of information. A 'bad', purely objectified museum shop, with little connection to the exhibits, and therefore detached from the core-experience, could appear similarly 'cold' to the visitor. Necessary to achieve the ideal core (exhibit)-experience of 'time-and-space dreaming' or 'dreamscape' imagining was a 'warm' humanistic type of exhibition space - not too objectified, compressed with objects (or too Hi-tech). In contrast, there was a perception that an unsuited process of modernisation of the core learning spaces could effectively immerse the visitor within a compressed, Hi-tech, 'hot' spatial effect, that was not necessarily in keeping with the desired, ideal exhibit ambience, although perhaps more acceptable in designated 'entertainment' spaces, including some museum shops (provided it corresponded sufficiently to the exhibit's core-experience, cultural orientation).

**Figure 1. Museum/gallery space typology grid: differential space typology within the design and operation mix related to core desired experience dimensions.**

	<b>Core-Experience Detached</b>	<b>Core-Experience Active</b>
<b>Compressed/ Hi-object Hi- information (Hi-Tech)</b>	COLD 'pure' object exhibition 'bad' shop	HOT 'entertainment' exhibition 'good' shop
<b>Spacious/ Hi-context Hi-reflection (Lo-Tech)</b>	COOL modern cafe space reflective gallery	WARM 'context rich' exhibition 'core' learning space

Given the amount of objects presented for consideration during an overall visit, participants generally described café spaces as of a type where 'cooler', more relaxed social activity and subjective reflection upon the nature of the whole experience could take place. To adequately support this, the café spaces were considered to present opportunities in their servicescape design to present functional (technical food and service), mechanic (ambient and process design) and humanic (social performance and behaviour) related cues, or 'clues' that should ideally fit within their ideal visit dimensions<sup>7, 8</sup>. Rather than considering the museum café as a detached food service offering, such clues should be orchestrated to deliver a consistent service message within parameters of the ideal holistic visit experience. The research further attempted to characterise the specific café design dimensions, spatial qualities, or clues would be suitable within various museum, gallery and 'housed' cultural attractions - which contextual parameters should they work within to support a suitably reflective, 'cool' atmosphere within each type of institution to become hi-context? This was elaborated by participants as pertaining to key reflective signifiers for each particular type establishment considered. The range of design signifiers were formulated into a mix of descriptors relative to the personally reflective nature of each visit experience as in Table 1. These including reflective aspects of *past*, *present*, *future*, *family* and/or *local* associations as enshrined in the establishment's exhibit orientation (local museums and historical houses proving to be particularly related to the latter two dimensions for their visitor experience). The holistic experience dimensions are assigned in summary, in relation to an ideal 'mix' for each type of establishment's core, or 'primary' visitor experience. By extension, ideal café design orientation parameters were then assigned; cafés being designed to provide a hi-context/highly reflective domain, complementarily integrated within the visitors' unified aesthetic desires of a visit.



**Table 1. Desired experience dimensions related to café design (ME = museum experience, LME= local museum exp., GE= gallery exp., CGE= contemporary gallery exp., HE= ‘house’ exp., L= local parameter orientation, F= family orientation - all related to stated time-dimensions; underlined/italicised signifying relative strength)**

<i>Primary experience dimensions</i>	<i>Café design orientation parameters</i>
<b>ME = (<u>past</u> + present) x L</b>	Past element can be contrasted with the contemporary, whilst the local element can be contrasted or supplemented in design
<b>LME = (<u>past</u> + present + future) x <u>L</u></b>	As above but local, place elements can be emphasised to greater extent in complimentary, catalytic or supplementary fashion
<b>GE = (<u>present</u> + past) x L.</b>	As with ME but accent on present as opposed to past implies greater potential for ‘modernism’ (or ‘futurism’) in design
<b>CGE = (<u>present</u> + future)</b>	Future element can be further complemented or supplemented
<b>HE = (<u>past</u> + pres) x (<u>F+L</u>).</b>	Past element can be contrasted but usually complimented, with potential for the local and family element to be emphasised in complimentary, catalytic or supplementary fashion – more ‘homely’

## Discussion

Food consumption is a readily apparent key signifier of non-everyday sensory experience whilst *in situ* in tourist/leisure domains, providing experiential reminder associations of indulgent, non-everyday food experiences<sup>9, 10</sup>. Museums and galleries are venues where people tend to go on a non-everyday outing and their café spaces can be considered to serve as major ‘pause’ reflective ‘places’ - not just spaces<sup>11</sup> - of meaningful significance during a visit. This suggests such cafes are effectively an escape within an escape (a dream within a dream) within the museum visit experience, providing a reflective extension of the non-everyday museum/gallery visit for contemplation of the beautiful and the sublime as presented across the full visit. In this role, museum cafés should be designed to offer suitably integrated ‘dreamscape’ environments, synergistic to the museum/gallery core experience. The café may then even stand as a key motivator for attraction towards the pleasures of the

museum itself, as typified by the 1980's Saatchi and Saatchi advertising campaign for the Victoria and Albert (V&A) museum in London as 'An ace cafe with quite a nice museum attached'<sup>12</sup>. This museum spatial study suggests that the café design involves the creation of intellectual 'resting' leisure space, effectively providing - as with other leisure food consumption events - a 'cognitive suspension to experience moments of pleasure in another world than this'<sup>13</sup>! This can only be achieved through the application of suitably considered food service design dimensions for holistic visit experience integration.

### **Conclusions, limitations and suggestions for further research**

Museum café design should ideally encompass experiential signifiers to support visitors' contemplation of, or reflection upon, aspects of socio-cultural significance - the beautiful and the sublime - as represented by each distinct type of venue. The café space offers an extended immersion in time and space within a distinctly non-everyday, reflective ambience. The design of museum cafés as spaces not only to eat in but also to dream in provides challenges to food service providers, but ones that could result in the cafés themselves becoming motivators for institutional visits and longer stays due to their particularly appealing and distinctive design dimensions. It should be stated as a limitation that the current research was largely carried out within a middle-class area with participants who were overall more likely to be museum/gallery visitors than not...and possibly as oriented towards the aesthetic appreciation of leisure eating environments as towards the purely functional dimensions of food provision. Nevertheless further research into specific design parameter needs for the integration of specific food services within defined spatial, cultural experiences in the maturing leisure market could reap increased visitation, re-visititation and higher visitor spend rewards for their operators.

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**SECTION 2 – PERSPECTIVES ON FOODS**

## **Towards a theory of black food**

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**Keywords: black food, culinary arts, gastronomy, food preference**

### **Abstract**

The research problem is that so-called black food is an interpretation of something that is dark. It is therefore necessary to examine what human consciousness understands to be black food through the inductive development of a black food typology.

### **Introduction**

Some of the most expensive foods, including beluga caviar and Périgord truffle, are black. However, when exploring how people experience food colour, it became clear that little is known of human interactions with black foods. A broad commonality of our cultural core is that everyone eats, yet the role of colour in food preference and enjoyment remains difficult to elucidate. Perhaps this is even more so for black food.

We make judgements about food quality and acceptability based, in large measure, on colour attributes<sup>1</sup>. Food colour provides a direct or indirect estimate of quality. Colour indicates what foods are safe to eat; for example, fruit maturation and ripeness, or stage of cooking and doneness. Food colour can influence or interfere with taste thresholds for sweetness perception, flavour identification and intensity, and pleasantness<sup>2</sup>. Again, an assessment of attitudes to black food is lacking. The external environment consists of matter that has shape, mass and texture, but colour is not a physical property of the world. We discern colour by distinguishing wavelengths of light reflected from an object. Light is not coloured. Colour is a manifestation of the visual pathway leading from the photoreceptors in the eye to the brain, where the visual cortex constructs images and assigns colours to differentiated electrical signals stimulated by rays of light reflected from objects<sup>3</sup>.

The interpretation of neural stimulus as colour is not fully understood at a physiological level, nor can we directly observe the thoughts and emotions evoked by colours<sup>3</sup>. Yet, colour is measurable. The colours we see are largely due to the reflective qualities of pigments that absorb and reflect specific

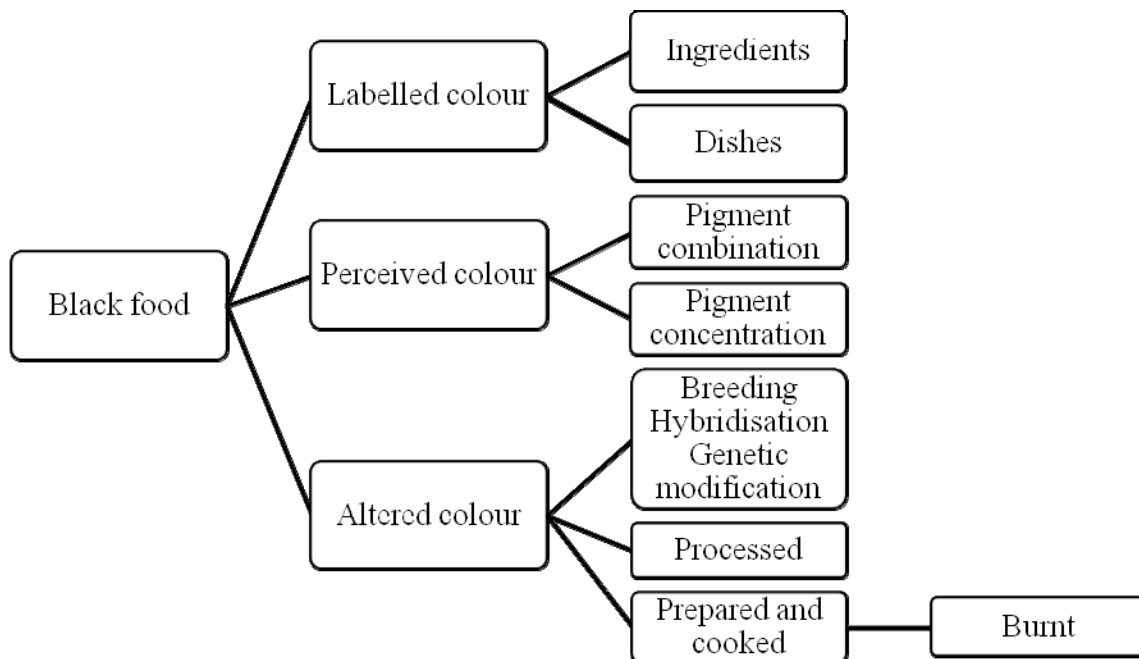
wavelengths in our visual spectrum<sup>3</sup>. A leaf is green because chlorophyll's molecular structure absorbs red and violet rays and reflects light not used as energy in photosynthesis which is perceived as green. Black is the colour of objects that do not reflect but absorb all visible light.

## **Methods**

This paper presents an inductively created typology of black food providing a conceptual framework on which to base further investigation. Typologies are a structuring methodological tool used to create new knowledge and to increase understanding of component relationships<sup>4</sup>. Indeed Doty and Glick<sup>5</sup> argue that typologies provide a unique form of theory building and are not merely simplistic classification systems. Qualitative research of this nature is appropriate given that it is largely an exploratory and intuitive investigation<sup>6</sup> initiating the development of a theory of black food.

## **Results**

Empirical measurement of optical black is too narrow as a description of black food. Development of a typology of black food arose from an inductive process based on the premise that colour reality is perceived or understood in human consciousness<sup>3</sup> and therefore topological categories were created based on human interpretation and interaction. Thus, providing a method of organising information to describe and open gastronomic conversations contributing to the understanding of black food. The model in Figure 1 proposes that black food may be classified into three categories according to the way people label, perceive and alter food colour which, in turn, encompass sub-categories.

**Figure 1. A theoretical typology of black food**

## Discussion

The following discussion of the model provides a small selection of foods considered when determining the black food topology. The first issue when approaching research on black food is that sometimes the difference between the actual colour and the named colour is such that it represents merely a label. ‘Red’ wine may be a fair description, but if ‘white’ wine was actually white it would look more like milk. And yet when observing red wine, is it really red? A glass of Merlot may have a colour intensity that suggests blackness. Thus, labels often provide an overly simplified description of food; ‘black coffee’ denotes the absence of milk. Alternatively, labels serve to provide comparative distinctions between say, green, black, white and pink peppercorns<sup>7</sup>. Labels may introduce confusion; black rice is a descriptor frequently applied to *Oryza sativa* species and the botanically distinct *Zizania aquatic* ‘wild rice’<sup>8</sup>. Some dishes or foods are a composite of ingredients such as Black Bun, a traditional Scottish fruitcake<sup>9</sup>, and Black Butter, a thick apple sauce with strong links with the people of Jersey, in the Channel Islands<sup>10</sup>. Foods from other cultures or regions add to issues relating to labels or names. *Mole Negro* is a complex concoction of ingredients, including chocolate, resulting in a near-black Mexican sauce<sup>11</sup>. Spanish Ibérico ham is popularly known as *Pata Negra* meaning ‘black hoof’, in reference to the black pigs<sup>12</sup>. A Venetian specialty *Risotto Nero*<sup>13</sup> is similar to *Crni Rižot*, a popular dish prepared along the Dalmatian coast of Croatia<sup>14</sup>, both include cuttlefish ink. Melanin provides the dark ink pigment of the cephalopod escape mechanism<sup>15</sup>. Some problems relating to food labels lie in our inability to

express nuanced colour in language<sup>16</sup>. Then there are foods that, until they are viewed, provide no clue in their name of their dark colouration as is the case with Casseille (*Ribes x culverwellii*), a blackcurrant gooseberry hybrid, or Jamun (*Syzygium cumini*)<sup>17</sup>.

Erroneous labelling may arise from the second category of black food in terms of what is perceived to be black, due to a combination and/or high concentration of pigments. The Dutch portrait painter, Frans Hals, developed a refined technique for rendering no less than twenty-seven perceptively different blacks<sup>18</sup>. Claude Monet, like the Impressionists of his era, claimed there is no black in nature; he used no black pigments but actually painted in extremely vivid colours, including bright vermilion red, French ultramarine blue and emerald green to create the impression of black<sup>16</sup>. Without the acutely developed eye of these painters people claim to know and accurately identify colours. But, perceived black food may be the result of pigment combinations, which depending on their balance and intensity, absorb evenly across the visual spectrum to produce grades of black. Generally, complex developmental processes involved in fruit maturation result in degradation of chlorophyll and revelation and/or synthesis of intense colours that signal to predators that the fruit is good to eat thereby promoting dispersal of mature seed<sup>19</sup>. Sometimes chlorophyll is not degraded and pigment co-existence<sup>19</sup>, like Monet's paintings, result in perceived black capsicum, eggplant, and tomato cultivars. Interestingly, black carrots are considered a sound technological source of natural colorant for use in the food industry<sup>19</sup>. Likewise, concentrated colour either as a ratio of pigmented and non-pigmented cells and/or the number of epidermal cell layers may also affect the overall perception of blackness<sup>19</sup>. The good news for black fruit and vegetables is that dark concentrated colours provide an indirect estimate of chemical components as indices of health quality. For example, the Oxygen Radical Absorbance Capacity (ORAC) antioxidant values suggest that blackcurrants (7960) compares particularly well against redcurrants (3387) and the generally well regarded brewed green tea (1253)<sup>20</sup>. Nutritional advice has shifted from 'eat your greens' to 'eat a variety of fruit and vegetables each day' to 'eat colourful foods'; perhaps we should 'eat black produce'?

Human intervention gives rise to the third category of black food. Food colour can be altered through breeding, hybridisation, or genetic modification selecting for favoured properties or traits of interest. New commercially dominant blacker eggplant cultivars have been developed by selecting for fruits that have higher concentrations of anthocyanins in the epicarp cell vacuoles, reinforced by chlorophyll in the sub-epidermis layers<sup>21,22</sup>. Processing also alters pigment and product structure. The familiar black colouration of vanilla develops with the desired flavour profile as the pods progress through many labour intensive stages<sup>7</sup>. Processing of this nature takes advantage of a plant's response to tissue



injury, resulting in modification, aggregation and fusion of relatively simple molecules into complex structures which absorb across the visual spectrum<sup>23</sup>. Black liquorice extract is derived in an entirely different process and is obtained by boiling the dried shredded *Glycyrrhiza* roots and concentrating the extract in evaporators<sup>7</sup>.

During food processing and cooking, colour properties so patiently selected for in breeding can be lost with the removal of surface layers and dissipation of pigments. Anthocyanins associated with purplish black fruits are notoriously unstable and may dissolve in water, appear red, purple or blue, according to changing pH, interact with sugars and other ingredients, and are subject to thermal degradation causing pigment loss and discolouration<sup>24</sup>. For example, dark fruit preserves remain reasonably attractive because of the initial high pigment concentration and, even when anthocyanin content declines, the degradation products are a reddish brown<sup>24</sup>. Other processing methods that result in black foods include fermentation (black whey<sup>25</sup>), pickling (pickled walnuts<sup>26</sup>), drying (black limes<sup>7</sup>) and simply the addition of a colorant. Cooking can modify pigments through the application of heat or is used to specifically obtain dark colouration along with flavour. For example, the melted black butter sauce, *beurre noir*, is heated until a dark brown colour and nutty flavour is achieved<sup>9</sup>. Melanoidins and caramels are formed by non-enzymatic browning reactions, usually when food is heated as occurs when coffee beans are roasted, contrasting with the enzymatic browning reactions necessary for making black tea<sup>27</sup>. Barbequing, grilling and smoking impart a desirable appearance and flavour but also increase exposure to carcinogens. The taste of smoke usually signifies the presence of polycyclic aromatic hydrocarbons occurring with incomplete combustion of organic material; however those associated with char may be scraped off food to reduce health risks but defeats the point of these methods of cookery. Heterocyclic amines are produced by chemical reactions in meat subjected to high or prolonged heat<sup>28</sup>. This class of carcinogen cannot be removed, but the amount that is produced can be limited by cooking meat until just done, not blackened. This is not to be confused with the New Orleans's cooking technique; usually 'blackened' fish is rubbed with a Cajun spice mixture and cooked in a very hot cast iron skillet to form a crisp crust<sup>9</sup>.

Burnt food is truly black but inedible – or is it? Burnt sugar, colloquially known as Black Jack, heated beyond the caramel stage<sup>29</sup>, is used to add colour and flavour to baked products and foods. Charcoal was the first man-made pigment<sup>30</sup>. As in art, charcoal continues to be used in culinary applications. *Sel noir*, a mixture of salt and vine cuttings ash, provides the edible black rind of artisanal cheese varieties such as *Saint-Maure de Touraine* or *Selles Sur Cher*<sup>31</sup>. Food grade Carbon Black is derived from the complete combustion of vegetable

material to residual carbon. This colorant is widely used in sugar confectionery but is not currently permitted in the United States<sup>32</sup>.

Developing a theory on black food is not an idle exercise as visual stimulus, including the colour and appearance of food, is strongly linked to consumer expectations<sup>1</sup>. Colour is a social phenomenon whereby, customarily, food must be the colour that the consumer has been brought up to consider appropriate<sup>1</sup>. Learnt colour codes indicate what, when, and how foods can be eaten safely. Food preferences are normally regionally based and influenced by local produce, economics, politics and religion, to become cultural norms. Blood is the key ingredient in black pudding<sup>9</sup>. Blood has not always been the dietary taboo it is for many people today. Distaste for blood is largely a religious construct<sup>33</sup>. Taboos may arise for emotional reasons and certain foods linked with times of hardship differentiate the dietary preferences of the rich and poor in society. Surprisingly, truffles were associated by the poor in France and Spain with famine, supplementing meagre rations when they could not be sold<sup>34</sup>.

To the Euro-centric eye, black foods seem to be subject to more than the usual dietary aversions, which may in part be attributed to the darker, more sinister history of the colour black<sup>30</sup>. However, in Asian culture black foods have long been associated with wellness, considered to have health properties long before those were elucidated by scientific research. Silkie chickens, a heritage breed referred to in an account of Marco Polo's 13th century travels<sup>35</sup>, are used in China to enhance the human immune system, prevent emaciation and feebleness, and treat diabetes, anaemia, menoxenia and postpartum complications<sup>26</sup>. The unique feature of this breed is the blackish melanin pigmentation that pervades the tissues and organs<sup>36,37</sup>. These chickens are bred by enthusiasts in Western society and are frequently available as family pets; however, obtaining them for culinary purposes represents a challenge, partly because of the lack of demand because of a preference for pale fleshed birds. Black is readily adopted as a fashion colour in dress and décor yet there is hesitation to accept 'inappropriately' coloured food<sup>1</sup>. This barrier to acculturation of black foods may be addressed through a deeper understanding of black food, in turn contributing to the aesthetic knowledge and competencies of culinary practitioners. Black food health properties suggest a way to overcome aversions. Examining black food provides a means of studying colour concepts employed to enhance food presentation and customer satisfaction. Improved economic circumstances permit people to seek gastronomic and novel food experiences, accordingly a restaurant with a reputation for culinary creativity and innovation may have a competitive advantage<sup>38</sup>. Therefore black foods contribute to culinary diversity and have a potentially valuable place on the menu – a suggestion affirmed in Peter Greenaway's film *The Cook, The Thief, His Wife and Her Lover*. When asked about menu pricing the Cook at *Le*

*Hollandais* restaurant responds: 'I charge a lot for anything black. Grapes, olives, blackcurrants... Black truffles are the most expensive. And caviar... Don't you think it's appropriate that the most expensive items are black?'<sup>39</sup>

## Conclusion

Developing a black food typology provides a theoretical framework to bring structure to further research. However, definitive conclusions in an exploratory investigation of this native are pre-emptive, particularly as it is emphasised that the purpose of this typology may not provide a final classification scheme and its usefulness in research of black food has yet to be tested. Black food research has multi-disciplinary interest, providing social, cultural, and gastronomic insights contributing to sensory science and culinary arts. Black food research provides culinary inspiration contributing to creativity and innovation. This may not necessarily mean the development of new black foods but the acculturation of black foods adopted from other societies. Acceptance of black foods may be encouraged not purely for their novelty value but for their potential health properties and also through a deeper understanding of the ideas, values, and practices that characterise foodways of other cultures.

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## **Antioxidant activity and total phenolic compounds of New Zealand spinach (*Tetragonia tetragonioides*): Changes during boiling**

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**Keywords: green vegetables; *Tetragonia tetragonioides*, antiradical activity, total phenolic, vegetable cooking**

### **Abstract**

Antiradical activity against DPPH<sup>•</sup> and total phenolic content of ten samples of New Zealand fresh spinach leaves (*Tetragonia tetragonioides*) cultivated in Portugal were evaluated. The EC<sub>50</sub> values concerning the radical scavenging activity of the samples ranged between 97.5 µg/ml and 319 µg/ml. The total phenolic content of raw New Zealand spinach varied between 27,9 and 58.2 mg GAE/ g of extract. Differences of maturity at harvest, growing conditions and soil state can explain the variability observed. Four batches of 140 g of spinach fresh leaves were boiled in 2 L of water in different times: 1; 2,5; 5; 10 minutes. Significant reduction of antiradical activity was observed up to five minutes boiling time, no changes were observed between 5 and 10 minutes cooking time. No significant changes were observed on total phenolic content after cooking.

### **Introduction**

Fruits and vegetables contain large amounts of natural antioxidant molecules, which can protect against several chronic diseases<sup>1</sup>. These protective effects are generally attributed to the presence of various functional components, such as, vitamin C, vitamin E, provitamins, minerals, fibre and phenolic compounds. Many of these compounds have bioactive mechanisms for effectively scavenging reactive oxygen species (ROS) and reducing cell proliferation in cancer cell<sup>2</sup>. Oxidative stress appears to be the critical factor in the pathogenesis

of many diseases because ROS have the ability to damage macromolecules like DNA, protein and lipids<sup>3</sup>. To minimize the harmful effects of oxidative stress in the human body, it is necessary to supply adequate amounts of ROS-scavengers, and fruits and vegetables are considered to be the major contributors of ROS-scavenging antioxidants; however the health effects of polyphenols depend on the amount consumed and also on their bioavailability.

The composition of fruits and vegetables depends both on species and on subtype, as well as on the environmental, farming, production, and storage conditions and some vegetables, often termed salad vegetables, are commonly eaten raw, many are cooked before they are eaten. In most case, whether a vegetable is eaten raw depends on personal choice. Most forms of cooking reduce the total nutrient content of vegetables, although the degree to which this happens varies between nutrients and with cooking methods. However, cooking also increases the bioavailability of some nutrients.

Spinach (*Spinacea oleracea* L.) is one of the vegetables considered to have a high nutritional value. Because of its abundance of phenolic compounds, spinach ranks high among vegetables in terms of antioxidant capacity, suggesting that spinach consumption may protect against oxidative stress mitigated by free-radical<sup>4, 5</sup>. However, spinach is often consumed fresh or stored frozen after cooking in boiling water. New Zealand spinach is a drought-resistant annual trailing vine with small triangular shaped, thick, dark green and succulent leaves. This species is grown when temperatures are too high for *Spinacea Oleracea*, and it is widely cultivated and consumed in temperated regions. Antioxidant activity and total phenolics content fresh and cooked spinach, were already evaluated<sup>6-8</sup>, but there are no similar studies made for New Zealand Spinach.

The aims of this study were to evaluate antiradical activity against DPPH• and total phenolic of New Zealand raw spinach (*Tetragonia tetragonioides*) cultivated in Portugal, and study the effect of boiling time on this type of spinach.

## Materials and methods

### *Samples*

Samples of New Zealand spinach (1 kg each) were collected in ten different regions of Portugal between February 27<sup>th</sup> and March 9<sup>th</sup> of 2009. Samples were numbered from 1 to 10. After harvesting, samples were immediately transferred to the laboratory, stems and leaves were separated and leaves frozen at -20 °C before analysis.



### ***Sample preparation***

*Extraction procedures:* for antioxidant capacity assay and total phenolics determination, methanolic extracts were prepared. Leaves were lyophilized and yields were calculated (minimum was 6,1% for sample 2 and maximum was 16,9% for sample 4). Then, three powdered sub samples (~4 g; 50 mesh) were extracted with 100mL of methanol for 20 min and filtered through 30 ml borosilicate Robu filter 3.3, pore 4. This procedure was repeated three times. The resulting extracts were pooled and the solvent evaporated in a rotary evaporator (Büchi® Rotavapor RE 111 equipped with a Büchi® 461 waterbath and Büchi® Vac V-500 vacuum pump). Then, the extract was lyophilized in a freeze dried apparatus. The lyophilized extracts were kept in a desiccator, in the dark.

*Cooking procedures:* batches of 140g of fresh leaves of sample 10 were boiled in 2 L of boiling water in different times: 1; 2,5; 5; 10 minutes. These samples were labelled as 10A, 10B, 10C and 10D. Raw leaves were used as control (sample 10). After cooking, samples were rapidly cooled and frozen until extraction procedures. Cooking water was changed for each experiment.

### **Radical scavenging activity using DPPH•**

The radical scavenging activity of the extracts was determined spectrophotometrically in a Biotek® ELX808 plate reader (Biotek Corporation, USA), by monitoring the disappearance of DPPH• at 515 nm, according to a described procedure<sup>9</sup>. The optimisation of the assay was studied for the samples in two steps: extractions were performed with pure and 50% (v/v) methanol and reaction conditions were tested with pure and 70% (m/v) ethanol extract and DPPH solutions. Kinetic behaviour of the different conditions was evaluated for determination of the incubation time. After selecting the optimal conditions, the assay was carried out as described below: for each extract, a dilution series composed of five different concentrations (15,53 – 1000 µg/ml) of the methanolic extracts was prepared in a 96-well plate. The reaction mixtures in the sample wells consisted of 100 µL methanolic extract and 100 µL DPPH•, both dissolved in ethanol 70%, prepared daily. Absorbances at 515 nm were measured during 3 h in 1 min intervals, until the reaction reached a plateau. These experiments were performed in triplicate.

The DPPH scavenging effect was expressed as EC<sub>50</sub>, which is the concentration of extract required to scavenge 50% of the radical present in the reaction medium, and was calculated according to the formula:

(1)

$$DPPH \text{ scavenging effect (\%)} = 100 - \left( \frac{A_{\text{extract}} - A_{\text{blank1}}}{A_{\text{control}} - A_{\text{blank2}}} \times 100 \right)$$

with  $A_{\text{extract}}$  as the absorbance of the extract against the DPPH solution,  $A_{\text{control}}$  the absorbance of the DPPH solution,  $A_{\text{blank1}}$  the absorbance of the extract alone and  $A_{\text{blank2}}$  the absorbance of ethanol 70% in the well. The percentage of remaining DPPH against the extract was then plotted to obtain  $EC_{50}$ .

### Total phenolic content (TPC)

The amount of total phenolics in the extracts was determined using the Folin-Ciocalteu colorimetric method, according to a described procedure<sup>9</sup>. Briefly, 1 mL of Folin-Ciocalteu reagent was added to 300  $\mu\text{L}$  of the lyophilized extract dissolved in ethanol:water (7:3) solution, followed by the addition of 5 mL of 20% sodium carbonate solution. The mixture was made up to 10 mL with water and thoroughly shaken and the absorbance was read after 20 min, at 735 nm (V 530, UV-VIS Spectrophotometer, Jasco Corporation, Japan). The contents are expressed as milligrams of gallic acid equivalents (GAE) per gram of dry extract. The standard calibration equation for gallic acid (concentration range 60–175  $\mu\text{g}\cdot\text{mL}^{-1}$ ) was  $y = 0.0033x - 0.0033$  ( $R^2 = 0.9992$ ). The measurements were performed in triplicate.

### Statistical treatment

The differences of the mean values were tested using Duncan's test ( $\alpha = 0,05$ ), with SPSS software, version 14.0.

## Results and discussion

### *Antiradical activity and total phenolic content in raw New Zealand spinach*

The  $EC_{50}$  values concerning the radical scavenging activity of the samples are shown in Table 1. The extract which presented the lowest  $EC_{50}$  value, hence the highest antiradical activity, was sample 10, with a value of 97.5  $\mu\text{g}/\text{ml}$ . The extract with the highest  $EC_{50}$  was sample 2, with a value of 319  $\mu\text{g}/\text{ml}$ . Both values had significant differences when compared with the other samples.

Concerning sample 2, the lower antiradical activity could be explained by the fact that the leaves were in a younger maturity stage when collected, since even under similar culture conditions the development of this vegetable depends on climatic conditions of the region. Pandjaitan referred that spinach leaves collected at midmaturity growth stages presented higher levels of total

phenolics, total flavonoids and antioxidant activity than immature or mature leaves<sup>7</sup>.

The total phenolic content of raw New Zealand spinach varied between 27,9 and 58.2 mg GAE/ g of extract, as shown in Table 1. Variation in total phenolic content (TPC) within raw vegetables can be explained by many factors such as species, variety, natural chemical composition, maturity at harvest, growing conditions, soil state and conditions of post-harvest storage<sup>10</sup>.

**Table 1. Antiradical activity and total phenolic content of raw New Zealand spinach**

Sample	EC <sub>50</sub> (µg/ml)	TPC
		(mg GAE/g of extract) (n=4)
1	224±32 <sup>c,d</sup>	33.2±1.2 <sup>c</sup>
2	319±36 <sup>e</sup>	27.9±1.6 <sup>b</sup>
3	176±7 <sup>b</sup>	40.8±1.3 <sup>d</sup>
4	155±32 <sup>b</sup>	41.8±1.4 <sup>d</sup>
5	242±27 <sup>d</sup>	39.9±2.1 <sup>d</sup>
6	190±38 <sup>b,c</sup>	42.5±2.8 <sup>d</sup>
7	169±23 <sup>b</sup>	35.0±4.4 <sup>c</sup>
8	204±18 <sup>b,c,d</sup>	40.9±1.3 <sup>d</sup>
9	229±48 <sup>d</sup>	32.4±2.2 <sup>c</sup>
10	97.5±10.9 <sup>a</sup>	58.2±2.4 <sup>a</sup>

<sup>a, b, c, d</sup> Means within columns with different superscripts are statistically different ( $p < 0,05$ )

In this work, a strong correlation between EC<sub>50</sub> and TPC was found (-0,471;  $p < 0,05$ ). Some studies report a strong correlation between EC<sub>50</sub>, indicating that phenolic compounds have the main role in antioxidant activity. However, there are some authors finding weak values for this correlation, attributable to the characteristics of the DPPH radical.

***Influence of cooking time on antiradical activity and TPC of New Zealand spinach***

Sample 10 was selected to evaluate the influence of cooking time on antiradical activity and TPC of New Zealand spinach since it presented the best value for antiradical activity ( $EC_{50}$  equal to 97.52  $\mu\text{g}/\text{ml}$ ). The changes of antiradical activity after thermal processing are presented in Table 2. The samples subjected to thermal processing for 1 minute, 2.5 minutes, 5 and 10 minutes were significantly different at  $p < 0.05$ , compared to raw sample, with  $EC_{50}$  values between 140.6 and 257.5  $\mu\text{g}/\text{ml}$ . We also observed significant differences between groups with different times of thermal processing, except for 10C and 10D that presented very similar  $EC_{50}$  values (Table 2).

**Table 2. Antiradical activity and total phenolic content in New Zealand spinach boiled during different times.**

<b>Boiling time (min)</b>	<b>Sample</b>	<b><math>EC_{50}</math> (<math>\mu\text{g}/\text{ml}</math>) (n=4)</b>	<b>TPC (mg GAE/g of extract) (n=4)</b>
0	10	97,5±10.9 <sup>a</sup>	58,2±2,4 <sup>a</sup>
1	10A	141±8 <sup>b</sup>	55,4±3,1 <sup>a</sup>
2,5	10B	189±15 <sup>c</sup>	57,7±2,5 <sup>a</sup>
5	10C	257±15 <sup>d</sup>	59,1±7,3 <sup>a</sup>
10	10D	257±20 <sup>d</sup>	59,2±6,1 <sup>a</sup>

<sup>a, b, c, d</sup> Means within columns with different superscripts are statistically different ( $p < 0,05$ )

When analyzing the results of  $EC_{50}$  values over 10 minutes, the antiradical efficiency of methanolic extracts of spinach leaves in New Zealand decreased linearly up to 5 minutes of cooking (sample 10C), as shown in Table 3. The samples 10C and 10D showed no significant differences between them, suggesting that the anti-radical activity and TPC values tend to stabilize after a certain time of cooking.

Studies performed on different vegetables after cooking showed that the total polyphenol content and antioxidant capacity could be either higher or lower in comparison to the fresh food <sup>5, 11, 12</sup>. Food processing and domestic cooking could result in higher polyphenol concentration when compared to raw samples

<sup>12</sup>. In contrast, the deleterious effects of heat treatment have already been shown for polyphenols as well as for their antioxidant capacity<sup>5, 8, 13</sup>.

## Conclusions

The antiradical activity of New Zealand spinach was strongly correlated with TPC. The differences found suggested a greater influence of environmental and genetic factors in the synthesis and accumulation of phenolic compounds in this species. Boiling spinach up to five minutes significantly reduced antiradical activity, with no changes observed after this cooking time. After this initial analysis, it's important to trace a phenolic profile of New Zealand spinach, as well as a study of their antioxidant activity with the use of different methodologies, in order to characterize them and their possible health benefits.

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## **Wholegrain foods: An example of a need for intervention studies within nutrition**

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**Keywords: whole grains, dietary interventions, randomised controlled trials**

### **Abstract**

"Whole grain" is a label used within food advertising to diffusely describe a wholesome product with health-giving benefits. Much of the scientific basis for the health benefits of wholegrain foods comes from observational (population-based) studies. European health-claims initiatives suggest that such associations do not equate to causal evidence on dietary intake affecting disease risk. Such evidence can only come from appropriately-designed dietary intervention studies. This review will highlight the benefits of such studies, as well as issues with their design. Finally recommendations are made for the future interactions between academics and the food industry to improve outputs from future intervention studies.

### **Introduction**

Increased consumption of wholegrain foods has been linked to a reduced risk of major disease. However, within the UK, there are no standardised definitions of whole grains or wholegrain foods. Within the US, the accepted definitions are that "*Whole grains shall consist of the ... endosperm, germ and bran ... in the same relative proportions as they exist in the intact caryopsis.*"<sup>1</sup>. A wholegrain food should contain greater than 51% whole grains by definition<sup>2</sup>.

Recent nationwide advertising campaigns have noted the presence of whole grains within foods as a mark of good health without qualifying such labelling. The European Commission has proposed that health claims on foods should be tightened, and the European Food Safety Authority (EFSA) has been tasked with reviewing and assessing these potential claims. EFSA has noted that in many areas of nutrition there is a scarcity of evidence supporting the causal relationships seen between the intake of foods and/or nutrients and altered

disease risk<sup>3</sup> and note the need for further appropriately designed dietary intervention studies to provide this evidence<sup>4</sup>. In a dietary intervention study, changes are made to the nutrient/food intake/dietary advice provided to free-living individuals and the effect upon relevant outcomes measures (e.g. body weight, eating patterns, fasting blood glucose) is subsequently assessed.

This paper aims to summarise some of the reasons behind the need for dietary intervention studies along with their appropriate design in relation to food groups/ whole foods (using whole grains as an example). Finally, the need and benefit to the food industry of such evidence will be discussed. Throughout this review, the term “whole foods” is not used to imply foods with associated health benefit, rather to describe foods (“good” or “bad”) as they would be habitually eaten by the consumer.

### **Gaps in the evidence**

There is an abundance of expert opinion relating to the benefits of wholegrain food consumption to health. This is mainly based on the strong correlation noted between increased wholegrain food consumption and decreased risk of a spectrum of cardiovascular diseases<sup>5</sup> and cancers<sup>6</sup> from observational studies. Compared with single nutrient-based studies, there has been considerably less evidence from laboratory-based experimental models (including animal studies) on the effects of whole foods (including wholegrain foods) on parameters of physiology and pathophysiology until very recently (e.g.<sup>7, 8</sup>).

Observational studies allow the investigator to test for an association between dietary intake and subsequent occurrence of a disease (i.e. in prospective studies), or to test for correlations between dietary intake and markers of disease risk (i.e. in cohort studies). The major concern with such data is that individuals rarely have an improved intake of one putatively healthy food group or food without also displaying overall healthy diet and lifestyle strategies in parallel. To some degree, such mitigating factors can be mathematically corrected for. Within the wholegrain food literature where such correction has been carried out, there still appears to be a strong correlation between increasing wholegrain food intake and reduced risk of major disease risk<sup>9</sup>.

Observational studies have routinely been suggested to relate to elective, lifelong consumption of nutrients, foods and food groups. As a result, it seems appropriate that they are used as the framework for a broad healthy eating template upon which government level dietary recommendations are made for the general public. Such guidelines should be aimed at promoting relevant healthy eating and lifestyle strategies across the population over the entire life-course.



However, there is a public need shared by public health bodies for information about whether changing the consumption of one nutrient/food/food group will have an impact (positive or negative) on their health. This is where there is a necessity for causal evidence that may only be possible through a series of appropriately designed dietary intervention studies. In relation to wholegrain foods, the current health claims allowed within the UK state that “people that eat wholegrain foods tend to have a healthier heart”. Intervention evidence in the area would give an answer (of “yes”, “no” or more likely “maybe”) to the question “Will eating more wholegrain foods reduce my risk of heart disease?” Without such evidence, the answer to such a question *should* always be “I have no idea”. It must also be noted that that a lack of evidence from a scarcity of intervention data is not the same as a lack of evidence as a result of intervention study data.

### **Challenges in the design of whole food interventions**

A recent, large-scale dietary intervention study showed no effect of wholegrain intervention on a primary outcome measure of plasma LDL cholesterol and a range of other markers of cardiovascular disease risk<sup>10</sup>. With relevance to whole foods versus nutrients, the first major hurdle in study design is that it is not possible in the majority of cases to run an intervention study as a randomised, placebo-controlled trial. For instance, reasonable amounts of a vitamin or fatty acid can easily be disguised within a capsule or tablet, which will have the same taste, texture and appearance as a placebo. Daily prescription of three slices of wholemeal bread or similar is impossible to hide from the participant. A further issue with whole food interventions is that, particularly where large volumes of foods are consumed every day, such intakes are likely to impact on the rest of the diet. As such, this moves away from the idea of a true intervention, as this may cause further changes between the intervention and control groups.

There is no lower limit suggested for the length of time of a dietary intervention study. Acute physiological studies can measure individuals’ responses to changes within one meal (e.g. glycaemic index), or to changes to the subsequent consumption of a standardised meal (e.g. satiety). However, the hypothesis that such short term effects could result in longer term health benefits remains unproven. While it seems obvious that the longer a dietary intervention, the more likely it should be to show an effect, outcomes are likely to be affected by potential non-compliance of participants, particularly in whole food or dietary recommendation interventions or adaptation to the change in diet. This is highlighted by most long-term (>1 year) weight loss strategies which show a maximal weight reduction at six months<sup>11,12,13</sup>. Compliance within free-living dietary studies (observational and intervention) is usually measured by recall (food frequency) questionnaire or food diary, which may be inherently biased

due to their potential to directly alter study participants' normal eating habits, or by participants simply filling in what they believe to be the correct answer<sup>14</sup>. To combat this, a range of new handheld technologies are currently being studied as measures of free-living dietary assessment<sup>15</sup>. Some recent studies have also assessed the potential for the use of -omic technologies as a way of measuring recent food intake<sup>16, 17</sup>. While such methods appear to have sufficient sensitivity to discern between single meal intakes of specific foods under well controlled conditions, such technologies are not currently feasible to assess global mixed dietary intake to gram amounts of food/macronutrients.

As there has been a lack of relevant funding in the area until recently, nutrition intervention studies have tended to be small in size and more often resemble pilot studies. Data from such studies are invaluable to assess how many participants will be needed for a study to have a reasonable chance of success (i.e. statistical power calculation)<sup>18</sup>. Study design is also governed by the type of outcome measure being assessed. A crossover study, where separate groups take part in all treatment arms of the study in different orders with “wash-out” periods in between, is relevant if the primary outcome measure will respond to changes quickly upon removal of the intervention substance (e.g. plasma concentrations of an inflammatory mediator). Such studies have lower inter-group variability and therefore require a lower number of individuals to participate. However, where the outcome measure is likely to be affected by previous treatments and/or is unlikely to respond rapidly during a wash-out period (e.g. body weight), a parallel design study is most appropriate. Due to the potential for larger inter-individual and inter-group variability, such studies require larger cohorts of participants for statistical power. Such studies are also more relevant where receiving the other treatment arms may influence the subsequent dietary decisions of the participants.

### **What does this mean to the food industry?**

In the short-term, a lack of evidence allowing health claims relating to a particular food type or product will drive the food industry to advertise products in a different way. While following these other strategies, it would be important to avoid blurring such strategies with quasi-health benefits within advertising campaigns. Over the longer term, it may be appropriate that the food industry take steps to follow the template for design, governance, management and publication of randomised, controlled trial data developed around the pharmaceutical industry. While the cost implications of such strategies may seem inhibitive with current business models, the enforcement of stricter food advertising legislation could necessitate investment in the future.

Recent meta-analysis data suggests that the occurrence of publication bias within the nutrition literature is common (e.g.<sup>19,20</sup>). Rowe et al., (2009)<sup>21</sup> pointed out the necessity of a separation of future monetary input from scientific output, which would not be viewed favourably by standard business models. In the long-term the basis of industrial funding of research should be founded on studies with relevant scientific outcomes (particularly in relation to health claims), but should also be assessed upon scientific excellence for longer-term benefits to both scientists and the food industry.

While the appropriate design of a dietary intervention study will undoubtedly maximise the possibility that such a study will show an effect if one exists, it must be considered within initial budgeting and future planning. In order to develop the future food-health claims market, the following points are appropriate for successful collaborations with independent researchers: 1) Consult the UK Research Councils in order to develop future funding opportunities aimed specifically at food-based dietary interventions. 2) A specific budget for outsourcing health-claim based dietary intervention study research. 3) Highlight centres of excellence in dietary intervention studies which are able, and equipped, to carry out such trials. 4) Develop a network of independent experts to peer-review suggested study designs for each consultation. 5) Development of discourse with journal editors in the field of nutrition with regards to publication of dietary intervention data and current issues that may exist within the peer-review process.

The above suggestions point towards a need for a monetary input from the food industry to a scale that historically has not previously been necessary. If the food industry wishes to pursue health claims as a means of driving sales, then it seems likely that longer-term strategic planning is required to provide such funding and maximise its use.

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## **Dietary seaweed and human health**

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**Keywords: seaweed, health, seaweed isolates**

### **Abstract**

Seaweed as an ingredient is growing in popularity largely due to its perceived health-giving properties supported by findings from epidemiological studies. Increased seaweed consumption has been linked to reduced risk of various diseases however there is a paucity of evidence for health benefits derived from robust randomised controlled trials (RCT). Emerging data from short-term RCT involving seaweed isolates are promising. Further investigation of seaweed as a wholefood ingredient is warranted. This review aims to highlight the food uses and potential health benefits of seaweeds.

### **Introduction**

For centuries seaweed has been consumed in Asia<sup>1</sup>; however, it is not a usual part of the Western diet. A recent move to introduce seaweed into European cuisine has met with limited success though it has gained acceptance in some Westernised cultures such as California and Hawaii, where local Japanese communities have had a tangible influence on dietary practices. Low consumer awareness regarding the potential health benefits of seaweed challenges its use in the daily diet<sup>2</sup>.

Consumption of seaweed in the UK is minimal at present<sup>3</sup> though there is no reliable intake data from routine dietary surveys<sup>4</sup>. Seaweed is gaining in popularity; in the USA and Canada it is cultivated in onshore tanks for a growing market and in Ireland there is renewed interest in this ingredient, once part of the traditional diet. Recipe books promoting 'sea' or 'marine vegetables'<sup>5</sup> in home-cooking are available to buy and as consumer health becomes increasingly influential in the food industry seaweed associated product development is slowly evolving.

Seaweeds are macroalgae: subclassified as brown (phaeophyta), red (rhodophyta) or green (chlorophyta), some of which are edible, and blue-green algae (cyanophyta), which are toxic<sup>6</sup>. To date, seaweed as a 'whole-food' has

been added to pasta<sup>7</sup>, bread<sup>8,9</sup>, and processed (Fairclough, personal communication) and low fat meats<sup>10</sup>.

### **Nutritional profile and acceptability of seaweed**

Habitual consumption of seaweed may offer a nutritionally rich addition to the diet; however, micronutrient intakes in excess of the RNI may be of concern to nutritionists, particularly where bioavailability is high. Previous authors have eloquently reported the nutritional value of 9 common edible seaweeds<sup>6</sup>. The rich mineral and trace element content of seaweed compared to terrestrial foods can impact negatively on its organoleptic characteristics<sup>6</sup>. However, it has been shown to be acceptable to consumers when baked into breads (*Ascophyllum nodosum* up to 5% w/w; Hall et al., 2010<sup>9</sup>; Mahadevan and Fairclough, personal communication) and added to pasta (*Undaria pinnatifida* up to 10% w/w<sup>7</sup>). Seaweed is high in fibre and contains many other potentially "bioactive" compounds<sup>6</sup>. Collectively, these results suggest that seaweed may be successfully combined into acceptable food products to potentially enhance their nutritional quality.

### **Seaweed as a whole-food**

Observational evidence linking seaweed intake to reduced disease risk is currently only relevant in South East Asian populations where seaweed is habitually consumed. Recent data are summarised in Table 1. In humans, an inverse correlation between seaweed consumption (*Alaria esculenta* (L.)) and serum oestradiol was demonstrated in a recent randomised controlled trial<sup>11</sup> which may in part explain epidemiology linking seaweed intake with reduced risk of hormone related diseases such as breast and endometrial cancers. *Rhodophyceae* seaweed significantly reduced the glycaemic response to a carbohydrate load in a small sample of healthy females<sup>12</sup> with possible implications for the management of type II diabetes and/or obesity.

**Table 1. Summary of recent observational studies relating to dietary seaweed intake and health**

Disease/ health concern	Study design	Odds ratio (95% CI) of highest seaweed to lowest	Refer- ence
Type II diabetes and pre-diabetes	3,405 Korean individuals, aged 20 - 65 y. retrospective study. Adjusted for diet and lifestyle	0.66 (0.43- 0.99) for men and 0.80 (0.51- 1.24) for women	13
Osteoporosis	214 Japanese elderly participants. Prospective study assessing calcaneus stiffness changes over 5 years. No adjustment of data.	0.22 (0.07-67) in all individuals	14
Obesity	3760 Japanese women aged 18- 20 y. Cross-sectional study assessing 3 different eating patterns	0.57 (0.37- 0.87) for BMI >25.0 <sup>a</sup>	15
CV mortality	40547 Japanese men and women aged 40-79 y. prospective study over seven years of follow-up. Not adjusted	0.73 (0.59 - 0.90) <sup>a</sup>	16
Allergic rhinosinusitis	1002 pregnant Japanese women. Cross-sectional study. Data adjusted for lifestyle and risk factors	0.51 (0.30- 0.87)	17
Breast cancer occurrence	South Korean case-control study. 362 cases (30-65y) with controls matched for age and menopausal status. Data adjusted for multivitamin supplement use, number of children, breastfeeding, dietary factors, education, exercise, oral contraceptive use.	0.48 (0.27- 0.86)	18



<sup>a</sup> Seaweed was included as part of a healthy/traditional Japanese eating pattern (i.e. high intakes of vegetables, mushrooms, seaweeds, potatoes, fish and shellfish, soy products, processed fish, fruit and salted vegetables) and was not assessed independently. CV = cardiovascular

The antimicrobial properties of seaweed isolates have been well documented<sup>19-21</sup>; however, there is a paucity of data on the antimicrobial properties and preservative effects of seaweed as a wholefood ingredient. In processed meat products (3% w/w incorporation) we have shown *Ascophyllum nodosum* to elicit antimicrobial effects. These were most noticeable against specific types of Gram negative micro-organisms (Fairclough, personal communication). Interestingly seaweed isolates have been shown to act more favourably against Gram positive organisms<sup>20, 22</sup>. We added *Ascophyllum nodosum* to preservative-free wholemeal bread (1.25% w/w) as a replacement for salt (as sodium chloride) with an associated suppression of mould growth up to 9 days compared to 3 days for the control bread (containing 5g sodium chloride without seaweed; Fairclough, personal communication). Such applications may be of considerable interest to food industries aiming to meet public health recommendations to voluntarily reduce the salt content of processed foods.

### **Seaweed isolates**

Isolated viscous seaweed polysaccharides are frequently used by the food industry in a wide variety of applications to benefit texture and stability<sup>23</sup>. In molecular gastronomy, such novel polysaccharides also present structural advantages in the production of foams and mousses, and allow both direct and reverse spherification. The above applications of seaweed polysaccharides benefit the organoleptic quality of foods. Experimental data exist suggesting that such factors, when used at higher concentrations, could benefit human health. For instance, alginate incorporation into foods and/or beverages has been shown to benefit acute physiological effects of meal consumption including reducing hunger and food intake and enhancing satiety, improving glycaemic control and reducing fat absorption<sup>24-27</sup>. Similar results have been reported in animal-feeding studies (reviewed elsewhere<sup>1, 28</sup>).

### **Potential negative effects of consuming seaweed or seaweed isolates**

Components of seaweed bind to and adsorb heavy metals<sup>29</sup>, meaning that seaweed is particularly prone to contamination from polluted water and its consumption is a potential route of heavy metals entering the body. Additionally, toxic blue-green algae species may grow on edible seaweed and have been noted in the literature to be a causative factor in food poisoning

occurrences<sup>30</sup>. Alginates and other seaweed isolates bind to divalent cations, which could affect the bioavailability of dietary calcium, iron and some trace elements (reviewed elsewhere<sup>28</sup>).

High consumption of seaweed in Japan and Korea by lactating mothers has been linked to neonatal iodine toxicity and consequent hypothyroidism<sup>31</sup>. High iodine intake is also not advisable in thyroid patients. Given the low levels of consumption of seaweed in the West, such concerns are of little public health relevance at present, although accurate dietary intake data for monitoring purposes would be useful in the light of increasing popularity with consumers.

## Conclusions

Seaweed may be an important ingredient of the future. Understanding seaweed as an ingredient may be beneficial for policy makers, practitioners, researchers and academics who contribute to the promotion of public health. Existing evidence presents a compelling argument for moderate inclusion of seaweed in the Western diet. However, long-term intervention studies (particularly well-powered, appropriately designed randomised-controlled trials) are necessary to assess whether dietary seaweed/seaweed fibre impacts positively on human health.

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**SECTION 3 – FOOD, DRINK AND ADOLESCENTS**

## **Relation between cooking habits and skills and Mediterranean diet in a sample of Portuguese adolescents**

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**Keywords:** cooking skills, culinary practices, adolescents, Mediterranean diet

### **Abstract**

**Objective:** To assess cooking habits and skills and its relationship with adolescents' gender and adherence to the Mediterranean diet.

**Methods:** A questionnaire was filled in by 390 adolescents from the 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> grade from a school in a semi-urban region in northern Portugal. Cooking habits and skills were self-reported and evaluated in a Likert scale between 0 and 5. Adherence to a Mediterranean diet was evaluated with the Kidmed index.

**Results:** Our sample had 55.1% of females and 44.9% of males, with a mean age of 13.5 years (sd=1.0). When questioned “do you know how to cook?”, the obtained answers revealed a mean of 2.6. Those who cooked did it usually between 1 and 4 times a month (56.2%). The answers were in the middle of the scale for the questions “do you like to cook” (mean=3.3) and “would you like to cook more often” (mean=3.4). However, most of our sample wanted “to learn to cook better” (mean=3.8). The Kidmed index was poor for 7.2%, average for 50.8% and good for 42.1%. Adolescents with higher Kidmed scores were younger ( $p=0.025$ ), knew how to cook better ( $p<0.001$ ), cooked more often ( $p<0.001$ ), liked more to cook ( $p<0.001$ ), would like to cook more frequently ( $p<0.001$ ), and would like to learn how to cook better ( $p<0.001$ ).

**Conclusions:** We found that better cooking habits and skills were positively related with adolescents' adherence to the Mediterranean diet. Our results are in line with the idea that teaching cooking skills to adolescents and children may have a positive impact in their future food choices.

### **Introduction**

Adolescence is an important stage for an adequate development of eating behaviours and, consequently, important health benefits<sup>1,2</sup>.

Health promotion focuses on change of knowledge, attitudes and behaviour. Culinary practices intersect these three mentioned factors<sup>3</sup>.

Food preparation experiences in youth can promote food skills and help them learn how to make healthier choices<sup>4</sup>. In addition, higher frequency of cooking by adults has been associated to better food choices<sup>5</sup>.

Little is known about the food-related skills of the adolescents. Therefore, the aim of the current study was to determine adolescents' cooking habits and skills and their relation with gender and adherence to the Mediterranean diet.

## **Methodology**

During the school year 2009/2010, between March and April, a questionnaire was filled in by 390 adolescents from the 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> grade in a school from a semi-urban region in northern Portugal. All the information gathered was anonymous and was obtained with the given consent of the student and the respective person in charge. The response rate for student participation was 73.7% (out of the total 529 students). The main reasons for lack of participation were absenteeism and failure to return consent form.

The applied questionnaire focused on self-reported cooking habits and skills ("do you know how to cook", "do you like to cook", "how often do you cook", "do you wish to cook more often", "would you like to learn to cook better"). Answers were given in a Likert scale between 0 "no" and 5 "very much". The reasons why adolescents did not cook and how have they learned how to cook were also assessed.

According to Francis Short, researchers definitions about cooking skills do not match with public concepts<sup>5</sup>. To ensure coherence between participants' responses the definition considered should be clearly stated<sup>6</sup>. In the present study the following definition was used: "Consider that cooking is preparing food from raw ingredients, i.e. cooking would be frying eggs, but not heating a pizza!".

To evaluate adherence to the Mediterranean diet, the KIDMED index was used<sup>7</sup>. Based on a list of 16 sentences about regular food habits that have to be evaluated as true or false, depending on its connotation with respect to the Mediterranean diet, each answer is then classified as giving one positive (+1) or negative (-1) score. The final value is obtained by the sum of all the scores and may range from -4 to 12. Adherence to the Mediterranean diet is considered poor if the score is below 4, medium if the score is between 4 and 7, and good if the score is higher than 7.

Demographic information was self-reported by adolescents' participants and included age, gender, school grade, household composition and education level of the person in charge of the adolescent.

The questionnaire was pre-tested with volunteer adolescents that were not included in the final sample.

Data were analysed using SPSSWIN16.0. Descriptive statistics were carried out. Statistical analysis consisted on Student's t-test, chi-square test (with Fisher's correction), Mann-Whitney test and Pearson's and Spearman's correlation coefficients. Differences were considered statistically significant at the 0.05 level.

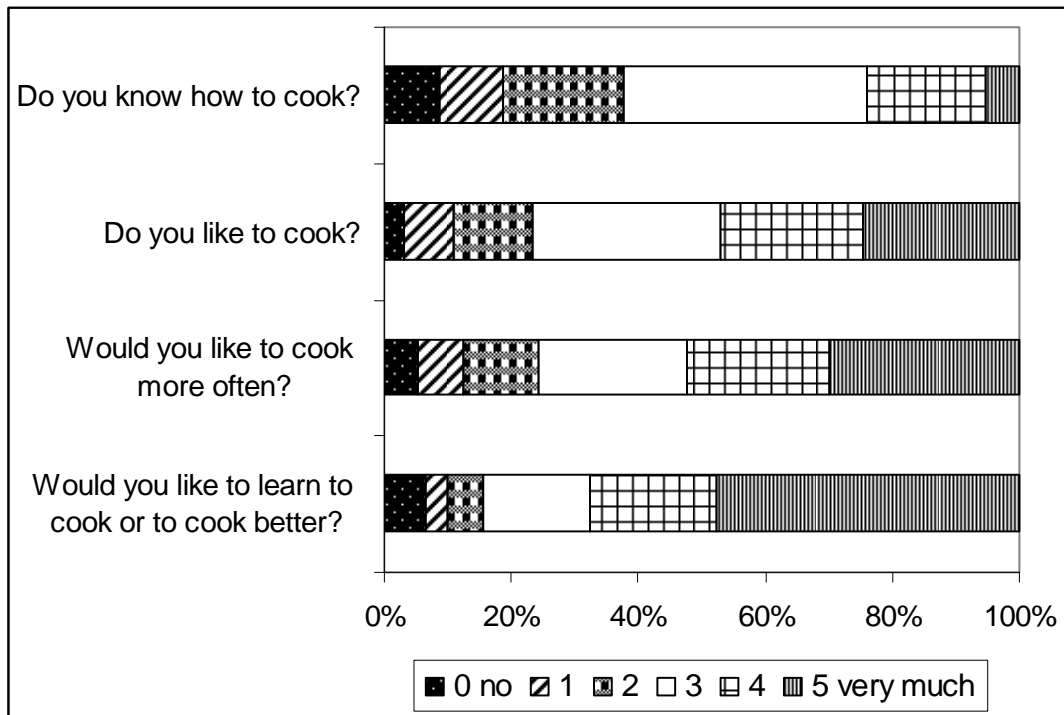
## **Results**

Our sample had 390 adolescents, 55.1% females and 44.9% males. The mean age was 13.5 years with a standard deviation (sd) of 1.0 years. The person in charge of the adolescent was, in general, a parent that most frequently had an education level between 1 and 6 school years (64.3%). Our sample had 55.4% of adolescents living with both mother, father (or stepmother/stepfather) and brothers.

The students answers to "do you know how to cook" were in the middle of the scale, with a mean of 2.6 points and  $sd= 1.3$ , with 8.7% of them answering "no". When questioned "do you like to cook", the answers were generally positive, with mean of 3.3 points and  $sd= 1.3$ . A similar result was found on the question "would you like to cook more often" (mean= 3.4 points;  $sd= 1.5$ ). Nevertheless, most of our sample wanted "to learn to cook better" (mean=3.8 points;  $sd= 1.5$ ). (Figure 1)



**Figure 1. Adolescents cooking habits and skills**

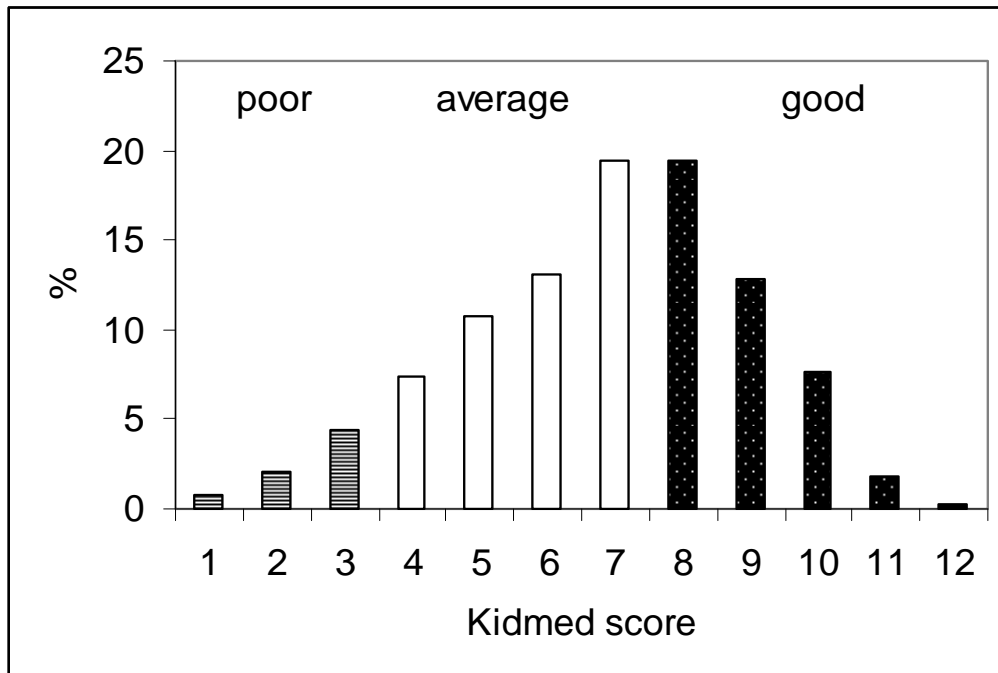


From the adolescents who knew how to cook, 28.4% did it more often than 2 times per week, 56.2% did it between 1 and 4 times a month and 15.4% did it rarely or never. A greater proportion of female than male respondents reported that they knew to cook ( $p=0.001$ ), liked more to cook ( $p=0.029$ ), cooked more frequently ( $p=0.006$ ) and would like to learn how to cook better ( $p<0.001$ ).

From the 390 participants, 34 adolescents refer not to cook due to two main motives: having someone who cook for them (47.1%) and don't like to cook (35.3%). Three (8.8%) students stated they never had someone teach them how to cook, two (5.9%) stated they did not have time to cook and one (2.9%) student referred to having fear of cooking. A greater proportion of adolescents who refer knowing how to cook, said that learned such skills with family (87.9%). 7.9% learned by themselves and the remaining 4.2% stated learning with friends or by cooking courses, culinary books and internet.

The KIDMED index was poor for 7.2 % of our sample, average for 50.8% of the adolescents and good for 42.1%. (Figure 2)

**Figure 2. Adolescents Kidmed scores**



Adolescents with higher Kidmed scores were younger, knew how to cook better, cooked more often, liked more to cook, would like to cook more frequently, and would like to learn how to cook better (Table 1).

**Table 1. Age, cooking habits and skills versus adherence to the Mediterranean diet**

Correlations with the Kidmed score	
Age	R=-0.113 (p=0.025)
Do you know how to cook?	$\rho$ =0.244 (p<0.001)
How often do you cook?	$\rho$ =0.201 (p<0.001)
Do you like to cook?	$\rho$ =0.289 (p<0.001)
Would you like to cook more often?	$\rho$ =0.234 (p<0.001)
Would you like to learn to cook or to cook better?	$\rho$ =0.286 (p<0.001)

Legend: Pearson (R) and Spearman ( $\rho$ ) correlation coefficients

The Kidmed score was similar between genders ( $p=0.810$ ). However, in some items of the Kidmed questionnaire we found a dependency on gender: “Goes more than once a week to a fast-food (hamburger) restaurant (11.4% boys and 2.8% girls,  $p=0.001$ ); consumes nuts regularly, at least 2-3 times per week (32.0% boys and 19.1% girls,  $p=0.005$ ); skips breakfast (9.7% boys and 22.3% girls,  $p=0.001$ ); has commercially baked goods or pastries for breakfast (24.2% boys and 41.7% girls,  $p<0.001$ ).

### **Discussion and conclusion**

We found that adolescents with higher adherence to the Mediterranean diet were younger, knew how to cook better, cooked more often, liked more to cook, and would like to cook more frequently and would like to learn how to cook better.

A greater proportion of female than male respondents reported that they knew to cook, liked to cook more, cooked more frequently and would like more to learn how to cook better. In line with other studies<sup>8,9</sup>, we found that female adolescents were more involved in cooking than males.

A greater proportion of adolescents who stated that they knew how to cook said they learned such skills from family. The study developed by Caraher et al.<sup>3</sup> showed that the first source of learning about cooking skills were mothers and cooking classes in school were mentioned as the next most important by the majority of respondents.

Accordingly with Winkler and Turrell<sup>6</sup>, adolescents should be encouraged, mainly by parents, to participate during meal preparation, in order to develop the necessary competencies for having healthy cooking practices. Also, our results agree with the idea that teaching cooking skills to adolescents and children may have a positive impact in their future food choices<sup>3</sup>.

### **Acknowledgements**

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**Appendix**

Questions included in the Kidmed (taken from reference 7)

Table 1 KIDMED test to assess the Mediterranean diet quality
Scoring
+1 Takes a fruit or fruit juice every day
+1 Has a second fruit every day
+1 Has fresh or cooked vegetables regularly once a day
+1 Has fresh or cooked vegetables more than once a day
+1 Consumes fish regularly (at least 2–3 times per week)
-1 Goes more than once a week to a fast-food (hamburger) restaurant
+1 Likes pulses and eats them more than once a week
+1 Consumes pasta or rice almost every day (5 or more times per week)
+1 Has cereals or grains (bread, etc.) for breakfast
+1 Consumes nuts regularly (at least 2–3 times per week)
+1 Uses olive oil at home
-1 Skips breakfast
+1 Has a dairy product for breakfast (yoghurt, milk, etc.)
-1 Has commercially baked goods or pastries for breakfast
+1 Takes two yoghurts and/or some cheese (40 g) daily
-1 Takes sweets and candy several times every day
KIDMED – Mediterranean Diet Quality Index in children and adolescents.

## **Acceptance of fish and fish products by Portuguese young consumers: An exploratory study based on mothers' evaluation**

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**Keywords: children, fish consumption, Portugal, qualitative study.**

### **Abstract**

Portugal is one of the major fish consuming countries in the World, from where one may collect experiences in order to improve fish consumption in other countries. The aim of this research is to explore the factors that influence the consumption of fish and seafood among 8-14 year old children from the Oporto metropolitan area. A focus group was conducted with mothers of children to gain insights into their knowledge, attitudes and perceptions regarding the inclusion of fish and fish products as a regular part of their children's diet. Narrative analysis was conducted based on Bardin content analysis. Findings indicated that children eat fish regularly, integrated into the family meal, and that mothers feel confident about their fish buying and preparation skills, leading them to incorporate fish regularly into family meals, with a choice of tastier easy to eat options.

### **Introduction**

Portuguese consumers have high levels of fish consumption. Portugal is the 3<sup>rd</sup> largest fish consumer in the world and the 1<sup>st</sup> in the 28 Europe: in 2005, the Portuguese per capita consumption was 60 kg/yr versus 23.7 kg/yr for EU-28. Despite a fall in the Portuguese per capita consumption of seafood to 57 kg/yr, in 2030, according to FAO projections, Portugal will maintain its position on the top of EU-28 seafood consumers<sup>1</sup>. In spite of the traditional incorporation in the diet and the high levels of seafood consumption in Portugal, there is scarce information regarding consumer attitudes towards fish consumption in this country, where lessons could be taken as a mean to improve fish consumption promotion campaigns in other countries<sup>2</sup>.

## Methods

A focus group was conducted with mothers of children and adolescents, aged 8 to 14 years to gain insights into their knowledge, attitudes and perceptions regarding the inclusion of fish and fish products as a regular part of their children's diet. Focus groups promote group interaction among participants as they query and explain themselves to each other, which offers valuable data through consensus and diversity and greater insight into why certain opinions are held<sup>3</sup>. To optimise the process, a focus group guide was designed, considering themes emerged from the literature<sup>4</sup> as well as other concepts considered relevant to address the purpose of this exploratory study. The guide considered the following structure regarding the progression of the discussion, after an initial icebreaker introduction: i) attitudes towards fish consumption; ii) fish purchase; iii) fish preparation. The focus group took place in a focus group room at a Portuguese food consumer research company, during July 2010. Discussion evolved during 65 minutes and session was video recorded for accuracy of transcription and analysis, following participants' permission. The recordings were anonymously transcribed verbatim. Narrative analysis was conducted based on the Bardin content analysis<sup>5</sup>.

## Results

A total of six women aged between 31 and 45 (average: 37±6 years), all married, mothers of a total of 8 children (5 boys and 3 girls), among 8-14 year old, from a middle-low socio-economic status, participated in this study. Focus group results are presented thematically. Citations used in this study were translated into English by the research team from the discussion transcription. Those were analyzed based upon the core themes of the focus group guide, considering similarities and differences<sup>6</sup>.

### *Attitudes towards fish consumption*

Participants indicated that their children eat frequently fish based meals, at least twice a week. With the exception of one participant, all the other mothers indicated that they prepared one single family meal rather than separate courses for children and adults. Curiously, that particular mother serves other types of fish or fish preparation to her young boy, assuring that he does not have to deal with fish bones. Moreover, the influence of own personal attitudes towards fish and those of children also impacted upon the type of fish served as a family meal, as participants adapted their fish dish to the family preferences.

- *“It's the same for everyone. Normally, I think there's no meal at home with two different courses. If she wants to eat, she eats, if not, there's always soup! I have no mood to cook two different courses”* (P4).

- *“He likes more boiled fish, or that white boneless whiting or salmon and so on... For instance, yesterday I cooked a fish meal. For myself, my husband and the youngster I cooked red fish... we had it plain, just with lettuce, but for X I boiled a potato with a piece of boneless whiting... he likes everything with no bones.”* (P1).

- *“We don’t like boiled fish. It must be grilled.”* (P2)

Despite a certain complaining against the consumption of fish, globally, children liked a variety of fish and shellfish. Registered favourite types of fish or seafood were: white fish fillets (referred for all the 8 children), whiting, fish fingers, gilt-head, sardines, salmon and shellfish. Mothers indicated a preference for fish often served with salad and mayonnaise.

- *“If it is fish he complains... but he eats!”* (P2)

- *“My daughter X likes everything. She loves fish fillets! She’s capable of eating two or three”.* (P6)

Reported children’s dislikes were: sardines (n = 4), cod (n = 2), red fish (n = 2), salmon (n = 1) and horse-mackerel (n = 1). These results are particularly interesting considering that both sardines and cod are very popular types of fish in Portugal and they are used for traditional dishes associated to Portuguese festivities and Christmas Season, respectively.

- *“Both my son and my daughter, don’t like cod fish... I mean, they eat it if they don’t have anything better... Moreover, at Christmas the tradition calls for cod fish... they don’t eat it. I’ll boil them a slice of whiting.”* (P5)

### ***Fish purchase***

When asked about the type of fish usually purchased for their families, participants said that their decision is influenced primary by appearance/freshness of the product and price, followed by fish availability at the store and family preferences.

- *“Nowadays, we have to look at the price: life is not easy! I take a look at the fish, if I like it I buy it, if not I don’t take it.”* (P5)

- *“For me, quality has two things: appearance and price. Price is important because there’s times when the prices rise drastically and we can’t buy fish! Normally, I follow what people eat at home, but I also follow what fits the eye in terms of appearance and price.”* (P3)

Participants listed a diversity of fresh fish/seafood (salmon, gilt-head, horse-mackerel, sardines, and shell fish), frozen products (octopus, squid, whiting, clean and deboned fish filets and pieces of whiting, cod fish, red fish, fish fingers) and tinned products (tuna and sardines).

- *“At our place we lunch at my mother-in-law’s, but at dinner time it’s frozen food almost every day. At night I’ll cook what’s in the freezer... whiting or any other fish. At lunch time we always have fresh fish as there’s a fish monger right next door.”* (P4)

Participants noted that they prefer to purchase frozen fish from organized retailing chains and fresh fish/seafood from fish mongers and from seafood specialty stores. All participants felt that all formats were easily accessible.



- *“I’ll buy the frozen fish. My husband will buy the fresh one as he will be at home by the time the fish monger passes by. I will buy frozen octopus, whiting or deboned whiting pieces.”* (P1)
- *“I buy at X or Y [organized retailers], both fresh and frozen... I always liked there, I like it!”* (P6)

### ***Fish preparation***

Overall, participants feel confident about their skills regarding fish preparation and cooking.

- *“They like everything I cook!”* (P1)
- *“The food I cook everyone eats”* (P2)

The most common cooking style referred by participants included battered and crumbled fish. The election of those fish preparations is forced by their children or husband’s preferences, as well as by cultural influences. For instance, the season and the nature of meal time (lunch or dinner) influence the food preparation, taking into account the possible unpleasant smell from grilling fish, for instance, and the weather.

- *“When I cook it at dinner time I’ll normally boil it or bake it to avoid having the entire house smelling.”* (P4)

Moreover, salads, during summer time, and vegetables, during cold weather, are often served as side dish. Participants reported that especially for battered fish, children enjoy it with mayonnaise.

- *“We always have mayonnaise with tuna or with fish fillets... I’ll prepare a potato salad and fish fillets.”* (P5)
- *“During summertime I’ll prepare lots of salads and soup. If I cook the soup with pasta or rice they don’t eat it, so I prefer salads. During winter, we prefer some warm soup and we’ll skip the salads.”* (P3)

### **Discussion**

The findings of this research emphasize that fish has always been an important part of Portuguese cuisine. One may consider the high frequency of fish consumption among young people clearly overcoming recommendations to eat fish twice a week<sup>7</sup>. Participants said that they felt confident in buying, preparing and cooking fish, promoting family fish habits consumption. This is in clear contrast with studies, from other countries, where the lack of confidence to prepare and cook fish is identified as one barrier related to the low frequency of fish consumption<sup>8-10</sup>. Appearance/freshness, price, availability and family preferences are the main determinants of fish choice, which is in accordance with others research<sup>4,9,11</sup>. Due to the knowledge on how to choose and prepare fish/seafood, participants mentioned the use of different store types to buy fish, as a function of their convenience and of the degree of processing (fresh, frozen, tinned). Despite fish meals not being the most preferred meal by children,

participants of this study referred that eating fish at home is a habit. This result is in accordance with the results of Verbeke and Vackier<sup>11</sup> study where habit emerges as a strong determinant of behaviour regarding fish consumption. Moreover, the bad smell and the presence of bones generally were not emphasized by the participants as barriers to their sons and daughters eating fish, contrasting with previous studies<sup>4,9</sup>. Additionally, some types of fish preparations emerge as being children's favourites, such as battered fish fillets with potato salad or with mayonnaise and fries, or tinned tuna on a salad or on a sandwich. This clearly contradicts results from both Aranceta et al.<sup>12</sup> and Cooke and Wardle<sup>13</sup> where children are depicted as having fish on the bottom of their food preferences or as disliking fish at all, respectively. To accomplish that objective, mothers prepare fish meals in accordance with children and husband's preferences, considering both the type of fish and the cooking style. However, the large emphasis on fried battered fish and on the use of mayonnaise on the side dish could deviate from a healthy way to prepare and consume fish.

## Conclusion

The present study suggests that mothers' confidence in fish buying and preparation, regular family meals and choice of tastier easy to eat options are major drivers to a high frequency of fish consumption among children. Authors stress that this is an exploratory study and findings are not generalisable to a larger population. Additional studies, covering different socio-economic status are being thought and organized.

## Acknowledgments

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## **Determinants of chocolate purchasing by young consumers in Poland**

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**Keywords: chocolate purchase, young consumer**

### **Abstract**

**Methods:** A questionnaire research was conducted among Polish young consumers using the internet in May, 2007.

**Results:** Chocolates were often purchased by young consumers and an important reason for their purchase was hunger or the willingness to fulfill the need to eat something sweet and also the need to improve mood.

**Conclusions:** There is a need to monitor the frequency and the amount of chocolate purchase by young consumers because of possible negative consequences of eating it.

### **Introduction**

In Poland sweets are characterized by increasing demand, willingly purchased and consumed by young consumers. Among the factors determining their purchase are, most of all, age, gender, dwelling place and many psychographic factors such as: opinions, motives and preferences<sup>1,2</sup>.

Demand for chocolates increases among young consumers to a considerable degree. Although the level of sweets consumed in Poland is not as high as in other European countries, the increase of the appearance of diseases caused, among others, by consumption of that group of products, including diabetes and obesity is still observed<sup>3</sup>. Thus an important role in prevention of negative effects on the health state plays the need of a constant monitoring of purchasing and consuming sweets, including chocolate. In the research performed on teenagers aged 10-16 years from 34 countries (mostly European) a significant negative correlation was observed between the consumption of sweets and chocolate and the BMI value in 31 out of 34 countries participating in the research<sup>3</sup>. Similar results were obtained in the United States<sup>4</sup>.

The aim of the paper is to present the behaviour patterns of young consumers on the chocolate market, connected with the place, amount and frequency of the purchase and some selected factors conditioning the purchase of chocolate.

## **Methods**

The empirical research was completed in May, 2007 by the System of Internet Research with the cooperation of the CEM Institute. People registered on the research panel who agreed to participate in the investigation took part in the research. The investigated population comprised 537 people aged 14-30 years, including 264 women (49.2%) and 273 men (50.8%). More than 1/4 of the investigated people (28.1%) comprised the respondents aged 14-18 years; 39.1% - aged 19-24 years and 32.8% the remaining of the investigated population.

The questionnaire included questions on the purchasing of the bars of chocolate for the respondent's own use. The questions concerned the frequency of purchasing chocolate, monthly amount of purchase, place of purchase, situations in which products are purchased and preferences concerning products.

Analysis of empirical material was performed using frequency analysis and cross tables, where the gender and age of the investigated people were used as diversifying variables.

## **Results**

Over 90% of the population declared the purchasing of chocolate bars (93.0%) and the number was higher in the case of women (95.0%) than men (91.0%), more people representing the age group 25-30 years (94.0%) than people from the youngest group (91.0). 5% of respondents buy chocolate every day or nearly every day; 20% 2-3 times a week; 26% once a week and 25% 2-3 times a month. The remaining people purchased chocolate less often including 7% who never purchase chocolate.

Over 1/3 of men (36%) and 31% of women declared purchasing chocolate products once a week. A clear difference between the declarations of men and women concerned the purchase frequency as a few times a month (33% and 46%, respectively). On the other hand, in particular age groups a significant differentiation was observed, especially between the youngest and the oldest age group. Relatively more older than younger people used to purchase chocolate 2-3 times a week or more often (Table 1).

**Table 1. The frequency of purchasing chocolate in the investigated population considering age of the investigated people (in %)**

Age groups	Frequency of purchasing						
	every day or nearly every day	2-3 times a week	once a week	2-3 times a month	once a month	less often	never
14-18 years	4,0	19,0	24,0	29,0	11,0	4,0	9,0
19–24 years	6,0	17,0	30,0	22,0	15,0	4,0	7,0
25–30 years	6,0	25,0	23,0	26,0	10,0	4,0	6,0

Source: The Internet Research System in cooperation with the CEM Institute, 2007

Over 1/4 of the population (28%) purchased one or two bars of chocolate a month and every third person purchased from three to four bars every month. As many as 40% of the population purchased more than four bars of chocolate a month. Similarly as in the case of the frequency of purchasing, there were small differences in the amount of the purchased product resulting from gender and age. However, it should be noted that men and older people used to purchase more chocolate.

Chocolates were purchased by most of the respondents in grocery shops or super and hypermarkets, with 3/4 of the respondents (72.0%) purchasing chocolate in super/hypermarkets. Gender and age did not differentiate places where those people did their shopping.

The main reason for buying chocolate was the need for something sweet (89.0%). Over one half of the investigated people (51.0%) treated the purchase of chocolate as a way to cheer themselves up, and the remaining reasons for buying chocolate were: ‘catching their fancy’ in the shop – 31.0%, as one of the products during regular shopping (23.0%), as an energy meal for an excursion - 22.0%, when the person feels magnesium deficit – 15.0%, as a meal for a journey – 10.0% and in the case of hunger, instead of another meal – 7.0%. The circumstances of buying chocolate in the case of men and women showed certain differentiation. More women than men purchased chocolate for cheering

them up (64.0% and 38.0%, respectively), as a magnesium supplement (18.0% and 13.0%, respectively), however, more men than women used to buy chocolate using it as the energy meal for excursions (28.0% and 15.0%, respectively) and in the case of hunger, instead of another meal (11.0% and 4.0%, respectively).

Factors which were decisive in buying chocolate were: its taste (85.0%), price (58.0%), and brand (53.0%). Such factors as the composition of the product, advertisement, promotion and competitions connected with purchase, caloric value, recommendation of acquaintances or the package were mentioned as important by only 3.0% to 10.0% of the population. Gender and age did not significantly differentiate the presented opinions.

Over half of the investigated people (55.0%) preferred milk chocolate, independently from the gender and age, 17.0% preferred white chocolate, 9.0% - mixed chocolate and only 7.0% bitter chocolate. More men (20.0%) than women (13.0%) declared the liking of white chocolate, while a reversed dependence was observed in the case of bitter chocolate, namely more women (10.0%) than men (5.0%) liked such chocolate. Respondents aged 25-30 years mostly preferred mixed chocolate (12.0%) and fewer representatives of that age group showed their preferences for white chocolate (10.0%) as compared to other age groups (19.0% at the age of 19-24 years and 21.0% at the age of 14-18 years). In the investigated group of young consumers 13.0% of people declared that they did not have any preferred type of chocolate, that group comprised slightly more men (14.0%) than women (11.0%) and more people aged 25-30 years (15.0%) than the remaining groups (12.0% each). Most people declared a positive preference towards both chocolate with and without additions (80.0%); this group comprised more women (83.0%) than men (77.0%). Among the preferred additions most people preferred hazelnuts (58.0%) as well as nuts and dried fruits (44.0%). Also more than 4/5 of the investigated people stated that they like both chocolate with filling and without and 12.0% of respondents declared that they like only chocolate without filling. Gender did not significantly differentiate the declared preferences. Among the most liked fillings the respondents pointed to toffee (43.0%), strawberry (43.0%), yoghurt (35.0%) and coconut (31.0%).

## **Discussion**

Chocolate is a product characterized by high content of fat and sucrose, i.e. highly calorific, thus the nutritional recommendations suggest limitation of its consumption, mainly due to the danger of overweight, obesity or dental caries. The consumption of chocolate fulfills energy requirements, thus reduces the feeling of hunger which in turn may lead to the reduced consumption of food

providing such nutritional components as vitamins and mineral elements. On the other hand, more and more often scientific evidence is presented that some substances which are present in chocolate may have a positive effect on human health. Cocoa mass is a rich source of numerous nutritional components and antioxidants which are beneficial for human health<sup>5,6</sup>. What is more, chocolate consumption may cause the reduction of pain perception and increase pain<sup>7</sup>.

The purchase of chocolate and then the data concerning the frequency of its purchase seems to be alarming, even if the amount of sweet consumption, including chocolate is lower in Poland than in other European countries. Despite the fact that gender and age did not significantly differentiate the habits connected with purchasing chocolate, it is worth noticing that older people buy chocolate more often than younger, which may suggest that such behaviour will be continued in the future. In other research the occurrence of a significant correlation depending on gender was indicated<sup>8,9</sup>. Women, especially during hormonal changes connected with the approaching menstruation cycle, consume larger amounts of chocolate<sup>10</sup>.

Chocolate may be purchased and consumed for many reasons which may be connected, among others, with preferences and improper nutritional habits<sup>11</sup>, and the influence of people around<sup>9,12</sup>. Young consumers made decisions about buying chocolate because they wanted something sweet or in order to improve their mood which suggests that they were taught to use chocolate as a means to fulfill their emotional needs. The dependence between emotional state and the frequency of chocolate consumption was confirmed by Hormes & Rozin<sup>10</sup> and Holter & Hamilton<sup>13</sup>, which is particularly clear in the case of women<sup>14, 8</sup>.

Sweets are more and more often used as a snack between meals or even as their substitute. An essential significance of sweets in fulfilling the temporary feeling of hunger is confirmed by many investigations<sup>15</sup>. The results of our own research proved that consumers purchased chocolate on account of its taste, price, brand and preferences. Positive preferences towards milk chocolate were observed and the tendency to buy bitter chocolate was observed in the case of women, who at the same time showed greater awareness concerning unfavourable effects of consuming sweet products<sup>16, 14</sup>.

### Conclusions

- Chocolates were often purchased by young consumers and an important reason for their purchase was hunger or the willingness to fulfill the need of eating something sweet and also the need of improving mood, physical or mental state and thus they are used to fulfill physiological and psychological needs. Among significant factors affecting the purchase of



chocolate taste, price and make were mentioned and the preferred type of chocolate was milk chocolate.

- There is a need to monitor the frequency and the amount of chocolate purchase by young consumers because of possible negative consequences of eating it.

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## **It's my party: Influences upon young adults to consume sparkling wine and champagne in restaurants, bars and night clubs**

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**Keywords: young adults / generation Y, champagne and sparkling wine, clubs, bars and restaurants, international study, Anglophone countries**

### **Abstract**

This is an international project investigating how young adults interact with sparkling wines and champagnes in a variety of hospitality environments. Research, via focus groups, was undertaken in the UK, New Zealand, United States, Australia and South Africa. The results show that two types of sparkling wine exist, “girly” fun wines and significant quality / champagne styles. They also show that whilst there is little difference in perceptions and usage in restaurants and nightclubs there are national, often gendered, difference in behaviours in bars and pubs.

### **Introduction**

As current research<sup>1</sup> shows one important area of focus for the international hospitality industry is the young adult population, those who are the next generation of wine consumers. This group, also known as Generation Y, comprising of those born between 1977 and 1999<sup>2</sup> will become of increasing importance as wine consumers over the next 40 years; indeed, some already seem to be spending substantial amounts on wine<sup>3</sup>. Despite the recession wine consumption continues to increase in the UK (by 1.3% in 2009<sup>4</sup>) with sparkling wines and champagnes rising from 10.9% to 11.2% of the total value of wines sold between 2005 and 2009<sup>4</sup>. This trend is confirmed by other market data<sup>5</sup>. This data<sup>5</sup> also shows that in the UK, whilst champagne consumption continues to rise, the overall increase in sparkling wine and champagne consumption has

been driven by sparkling wines especially cava wines from Spain. However the UK remains by far the largest export market<sup>6</sup> for champagne. Imports to the USA, the second largest export market<sup>6</sup>, are also increasing but are less than half that of the UK.

Traditionally champagne has had the image of a luxury product used to indicate significant events and / or wealth whilst other sparkling wines are often marketed simply as fun nights out; see for example the imagery used on the Moët et Chandon and Domaine Chandon websites. The exclusive, authentic, traditional image of champagne is an essential part of the rationale for the price it commands<sup>7</sup> and its importance at public socio/cultural gatherings such as weddings<sup>8</sup>. Attempts to 'modernise' usage by producers<sup>7</sup> and consumers<sup>9</sup>, such as drinking champagne with a straw from small bottles, often creates concern in relation to both debasing the image and accepted symbolic consumption behaviours. This is particularly true for moderately involved consumers whose habitual interaction with champagne is often a public demonstration of their personal capital<sup>8</sup>. However there is evidence<sup>10</sup> which suggests that some young adults, particularly women, do not see wine with bubbles in it as wine but rather as a fun pleasurable alternative, an image which producers such as Domaine Chandon or Freixnet seek to promote in their marketing.

Other research<sup>11</sup> shows that young adults are particularly susceptible to such marketing images e.g. having fun with cool friends in places like pubs, clubs and restaurants. Often living in multiple occupancy or parental accommodation, young adults tend to socialise outside the home. This should make them ideal consumers for the hospitality industry to attract and nurture as their next consumer generation. However young adults often have limited money and cost is a significant factor in their purchase of alcoholic beverages. As drinks in the on-trade are perceived to be expensive this may lead to significant preloading before a night out<sup>12</sup> and reduced consumption in the on-trade: the average price of a bottle of champagne / sparkling wine in the UK off-trade is £11.58 (€13.50) and £40.01 (€46.60) in the on-trade<sup>5</sup>. As Table 1 shows this difference is not as wide in all of the countries studied but in all instances champagne is more expensive than other traditional method sparkling wines.

However, resulting from the recession champagnes, albeit non-branded, have been sold in the off-trade in France for as little as €8.25<sup>13</sup>, which is less than the price of a quality, or even ordinary, sparkling wine in the on-trade (see Table 1). Since the general quality and quantity of sparkling wines available is driving expenditure up this has the potential to lead to confusion in image / perception and so usage of both sparkling wines and champagnes. It also enhances the belief amongst young adults that champagne is very expensive in the on-trade in Anglophone countries.

**Table 1. Average bar, nightclub and restaurant sparkling wine / champagne prices**

Wine	UK	USA	SA	AUS	NZ
Bar; Sparkling	£18-£25 / €21-€29	\$18-\$25 /€13-€18	R60 –R90 / €6 - €10	\$25-\$70 /€18-€51	\$30 - \$46 /€17-€26
Bar; Champagne	£35-£125/ €41-€145	\$50-\$70 /€37-€51	R400-R600 / €40-€60	\$120-\$220 /€87-€160	\$99-\$395 /€57-€226
Nightclub; Sparkling	£20-£60 /€35-€71	\$30-\$50 /€23-€37	R120– R180 /€12- €18	\$40-\$80 /€29-€58	\$30 - \$46 /€17-€26
Nightclub; Champagne	£40- £100 /€59-€118	\$60-\$105 /€44-€77	R900+/ €90+	\$150- \$220 /€109- €160	\$99-\$395 /€57-€226
Restaurant; Sparkling	£19 / €22	\$25-\$30/ €19 - €23	R60 –R90 / €6 - €10	\$25 / €19	\$45 - \$50 /€26 - €29
Restaurant; own country traditional method	N/A	\$40 - \$60/ €30 - €46	R120-R180 / €12-€18	\$50-\$65 / €38 - €49	\$45 - \$80 /€26 -€46
Restaurant; Champagne	£30 - £45 /€35 - €47	\$60+ / €46+	R450-R650 / €45-€65	\$80 -\$130 / €60 -€98	\$99 -\$395 /€57-€226

The aim of the full research project<sup>1</sup> was to establish how young adults in differing Anglophone countries currently perceive and therefore interact with champagne and sparkling wines. This paper will identify behaviours in relation to public or on-trade usage, i.e. in pubs/bars, clubs and restaurants. Understanding how sparkling wines are seen and used by young adults may enable the hospitality industry to provide a more accurately tailored experience which consumers would want to buy into more often. Whilst accepting that pre-loading often impacts upon public drinking behaviours it is not the purpose of this paper to investigate private drinking habits.

## Methodology

A summary of the methodology<sup>1</sup> is presented for brevity. This was a cross-cultural examination of young adults' views and interactions with champagne and sparkling wine based in Anglophone countries (UK, New Zealand, United States, Australia and South Africa) for ease of transcription and data analysis. Focus groups were run in each country using a common focus group guide and eight identical pictures of champagne / sparkling wines to stimulate discussion. Additionally each focus group tasted three masked samples, a non-French sparkling wine, usually cava; a local traditional method sparkling wine (available in the off-trade in the UK); and a champagne widely available in that country. Initial comments were sought as well as comments when the wines were unmasked. There were one hundred and seventy four participants, 57% female and 43% male. All the focus groups were recorded, transcribed and coded for anonymity (using a common formula) by the moderator. They were then analysed via Nvivo8 by the project co-ordinator and again by the lead author of each emergent paper. Although the participants were young adults aged between 18 and 30 (21 to 30 in the USA) care was taken not to use predominantly student populations as this has the potential to bias results<sup>1,11,12</sup>.

## Results and discussion

The UK participants showed one particular difference from the other participants. This was their acute awareness of the difference between sparkling wine and champagne. This is likely to be for two reasons. Although there is a high quality traditional method sparkling wine industry in the UK it is tiny, recently developed and the wine is hard to source away from south-east England. Additionally the UK has a centuries long tradition of buying champagne from France. Cava, on the other hand, was introduced into the UK in significant amounts in the 1990's where its image is impacted by its significance as part of the general supermarket wine offering – i.e. often sold on promotion. In all other participating countries whilst cheap and cheerful sparkling wine is produced such as 'Yellow' in Australia the terms sparkling wine and champagne were often used synonymously. However where champagne was used to describe a nationally produced sparkling wine a high quality traditional method wine / Cap Classique style was always meant. Thus all participants had a clear understanding that there is fun, fizzy, inexpensive wine and there is quality sparkling wine which is likely to be exclusive and expensive especially in the on-trade. Therefore the participants interacted with these two wine styles differently, some behaviours being common to all and others unique to particular cultures.

***Restaurant cultures***

The results in this section divided into two distinct topics. In one, participants talked about themselves as consumers, in the other many talked about their observations of others as they worked part-time in the hospitality industry. All participants talked about their image and so usage of sparkling wines and champagnes; champagne is for celebration, weddings, engagements, graduation and breakfasts<sup>7,8</sup> etc. It is used to toast the event. However because it is used to toast the event champagne was seen as something to consume either as an aperitif or as suitable when *'nibbles or platters of food are going round'* (NZ3). No participants considered it to be a food wine (i.e. something to drink during a meal) and certainly not something they would order when having a meal. There were two reasons given for not ordering: one was cost (see table 1); the other, lack of knowledge/ confidence in buying<sup>11</sup>. Conversely, but not unexpectedly, there was agreement that if it was bought by others they would happily drink it. This behaviour, not buying but consumption, is reflected in other research<sup>15</sup>. Reflecting other work<sup>11</sup> it suggests that in this age group the younger participants in particular lack the confidence and disposable income to eat out regularly in formal restaurant environments preferring cheaper cafes or pubs and drinking beer or spirits (individual purchase units) with their food. However they gain confidence and knowledge by the actions of 'others' who provide the formal meal occasions which they do attend, usually parents or work, and thus they learn and replicate these cultures<sup>11,14</sup>. All the participants were 30 or under yet one Australian participant suggested that champagne made *'you remember Breakfast at Tiffany's'* (AUS1), a film made in 1961 well before any of these young consumers (and some of their parents) were born. References to champagne as a suitable drink for special breakfasts were frequently made in the Australian, USA and New Zealand focus groups. They pointed out a paradox; drinking champagne for breakfast was classy; beer or vodka would make you *'like an alcoholic'* (AUS3).

Participants from the USA, UK, New Zealand and Australia who had / worked in the hospitality industry commented upon the behaviour of others in relation to champagne at events such as weddings and celebrations. They suggested that whilst 'champagne' had to be provided, especially at weddings, most people know very little about what they are drinking and that in the USA, Australia and New Zealand men might pick up a glass of bubbly for their female partners but get a beer for themselves. These participants suggested that the 'champagne' might in fact be a simple sparkling wine such as Yellow (see previous discussion), poured out of public view and circulated on trays. They acknowledged that this was cheaper, but could also explain why, in the participants opinion, 'champagne' at public events was often not worth drinking

- unless someone else was paying. None queried the ethics of, potential deception involved, in this behaviour by hospitality industry management or hosts.

### ***Bar cultures***

Consumption in pubs and bars had a far less unified image. There was general agreement that there are light bubbly, fruity, sparkling wines which are great especially for a girl's night, in or out, and then there is champagne / quality sparkling wine. However there was difference in when and where these could be consumed. The Australian, New Zealand and South African focus groups agreed that light and bubbly is for getting the party atmosphere going, especially for girls, but it could also be consumed on its own (NZ) or in cocktails (Aus, SA) in bars. In the UK, light and bubbly was also seen as a girls' night out; additionally UK participants agreed that sometimes in mixed or male groups champagne might be bought, perhaps to celebrate, perhaps to show off. This could happen only in a bar not a pub; since the beer would be better it would be pretentious especially for men. The UK rationale was that in a small group one bottle would be bought and shared within the group and each round/ bottle could cost less than a round of conventional drinks. Buying, being seen to buy, rounds is of extreme importance in UK pub and bar culture once income permits<sup>11</sup>. USA participants suggested that sparkling wine/ champagne could be consumed in high end / city centre and cocktail bars, but not in college or sports bars. This view was driven by income and image rather than gender.

### ***Nightclub cultures***

There was agreement that a bottle of champagne or sparkling wine was inappropriate in a night club if the participants wanted to dance; it would be impractical unless individual serves were available<sup>8</sup> but these were seen as girly even if champagne. The idea of champagne being used primarily to pose rather than celebrate unlike in bars was discussed in all countries. There was agreement in South Africa and the UK that the wine would have to actually be champagne, '*if you have a bottle of cava on the table, it's not much, you're not making a statement*' (UK3). Reference was made again in the UK to the fact that buying a bottle of champagne as a round is not necessarily that expensive when compared with other alcoholic drinks so if you are celebrating it can make financial sense. Female participants in New Zealand and the UK also discussed girls trying to get bottles of champagne / sparkling wine from DJ's or male customers as a challenge for the evening, presumably as a demonstration of attractiveness.



## Conclusion

Not unexpectedly there was universal agreement that those sparkling wines seen as fun were “girly”, suitable for “girls nights in” or away from the home and that they could be successfully be used to create a party atmosphere. Quality sparkling wines / champagne had a much more serious image - the celebration of significant events – thus, usage was not gendered. Of interest is how these perceptions were learnt, perhaps via intergenerational socialisation and work mentoring<sup>14</sup>, and their universal connotations. Whilst behaviours in restaurants and nightclubs were generally universal, perceptions of acceptable behaviours in bars and pubs were not; interaction with sparkling wine in these environments was often gendered and proscribed. Further understanding of these behaviours might help the international hospitality industry to develop their product to meet the particular expectations of this generation.

Finally, and unexpectedly, this research began to explore the impact of the casual work in restaurants, bars and nightclubs that many young adults undertake at some stage. This potentially exposes them to the best experiences but also some less good practice which, without prior knowledge and or experience, they accept to be the norm. This is likely to impact upon the future behaviour<sup>11</sup>. For example, those who saw and served Yellow as ‘champagne’ are unlikely to be persuaded of the quality of the sparkling product at future events. However there is a huge difference in profit margin between beer and Yellow or Janz and Moet et Chandon. Therefore this is an area which managers of hospitality businesses should give serious attention to.

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## **Carrot texture preference of 7-to-11-year-old children**

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**Keywords: texture, children, vegetable**

### **Abstract**

The present study aimed to investigate carrot texture preference in children. Participants were 7-to-11-year-old children from six different schools. The participants tasted and evaluated two different shapes of carrots (one familiar: slice; one unfamiliar: stick) and two different hardness (soft; crunchy) during school lunches.

Results showed that children preferred crunchy carrots with the familiar shape. Furthermore, it seems that familiarity with the carrots shape surpasses hardness in the evaluation of the carrots liking. Future research should better control children's familiarity with vegetables in order to deeply explore the role of both sensory and familiarity factors.

### **Introduction**

The concept of texture is multidimensional and refers to several parameters. Szczesniak<sup>1</sup> define this concept as “the sensory and functional manifestation of the structural, mechanical and surface properties of foods detected through the senses of vision, hearing, touch and kinesthetics”. Several studies demonstrated that texture could influence the acceptance of a food<sup>2</sup>. Furthermore, texture appreciation is linked with the specific food type and affected by several factors: cultural, attitudinal or demographical factors<sup>2</sup>. It was shown that texture is a determinant variable of the development of food preferences in children<sup>3</sup>. However only few papers have described how texture preferences develops during infancy and there is a stronger lack of research covering the childhood period.

After the age of six months, children start to consume semi-solid foods (purees) and around 10 months they experience different textures<sup>4</sup>. At 12 months,

children prefer pureed carrots than chopped carrots<sup>4</sup>. As children grow up and develop their feeding behavior, an increase of their tongue mobility is observed, as well as an improvement of their jaw movement and of the manipulation of more complex textures<sup>3</sup>. This evolution could influence the development of children's texture preference. Generally, children do not like to mix different textures; they prefer to finish one type of food before starting on another<sup>1</sup>. Zeinstra et al.<sup>5</sup> analyzed how different preparation methods could influence children and young adults' liking for vegetables. They observed a preference for boiled and stir-fried vegetables and their results were moderately related to the crunchiness of vegetables prepared with these methods. This preference for crunchy vegetables in childhood was also underlined by Baxter et al.<sup>6</sup> and Szczesniak<sup>3</sup>.

As it has been underlined above, texture could also be evaluated visually and previous research showed that appearance plays an important role in children's expectations about vegetable acceptance<sup>1,6</sup>. Furthermore, children prefer to choose familiar food and give higher liking rates for them<sup>7,8</sup>.

The purpose of this study was to evaluate the impact of texture on 7-to-11-year-old children's liking and preference for carrots. We were interested in two texture parameters: hardness and shape. Also, we wanted to evaluate the role of these factors on visual liking and then, after tasting the product, on overall appreciation. In order to modulate the hardness we selected two different durations of cooking. Concerning the shape, we selected one usual serving shape of carrots and one more unusual shape. With regards to the literature, our hypothesis was to observe a preference for crunchy vegetables. Also, we were expected that children would prefer the more familiar shape of carrots. To summarize, this work focuses on children's preferences for carrots in relation to shape and hardness.

## **Method**

### ***General setup***

Tests were organised in school canteens in order to collect data in a natural environment setting. In total, six canteens (Civrieux d'Azergues, Collonges en Mont d'Or, Dagnieu, Lyon, Neuville sur Saône, Valence) from the Rhône Alpes region (France) participated to this study. In these schools, children have a one hour lunch break and receive food at the canteen (a starter, a main course, a dairy product and a dessert). Parents were informed about the study by the head of each school.

**Participants**

Participants were children aged from 7-to-11-years old (see Table 1). In total 677 children participated in the study (Female=49%, Male=51%).

**Table 1. Participants**

Test carrot	7yr	8yr	9yr	10yr	11yr	Total
School 1	14	27	24	27	13	105
School 2	20	39	42	57	28	186
School 3	5	21	9	24	12	71
School 4	7	23	21	28	18	97
School 5	34	24	28	30	15	131
School 6	0	19	11	34	23	87
<b>Total</b>	<b>80</b>	<b>153</b>	<b>135</b>	<b>200</b>	<b>109</b>	<b>677</b>

**Products**

Products were pre-cooked frozen carrots which were stir-fried in the canteen. We built an experimental design with two levels for each factor (hardness, shape) (Table 2). We selected two very distinct levels of hardness in order to have crunchy and soft carrots. We identified one common shape for carrots which is “slice” and one less known shape which is “stick”. Products were presented in pairs to children with meat as a main course. One of the six possible pairs (see Table 2: AB, AC, AD, BC, BD, CD) was served in each school canteen.

**Table 2. Experimental design**

		Hardness	
		+	-
Shape	+	Crunchy slice (A)	Soft slice (B)
	-	Crunchy stick (C)	Soft stick (D)

***Procedure***

One of the experimenters gave a questionnaire to each child when children were waiting to collect their food. The experimenter explained to them very briefly that they were going to participate in a vegetable tasting and they should fill out a questionnaire.

Children were first asked to look at their main course and evaluate visually both kinds of carrots. They should rate their appreciation on a 3-point liking scale with cartoon faces (9) and then they should evaluate their preference by ticking the box opposite to the one they preferred. Then, they should try each kind of carrots and evaluate them again after tasting (appreciation and preference). Finally, children should write their first name, their gender, their age and their classroom.

***Data analysis***

Two-way ANOVA (factors subject and product) were performed to establish significant differences in hedonic responses between products for each of the six pairs tested. Then the preference test data were analyzed with a binomial distribution test in order to evaluate if one of the two products tested were significantly preferred.

**Results**

Results indicate for both shapes that visual and “in mouth” liking means were higher when carrots were crunchy (Table 3). However the differences were only significant for carrot slices in the case of pair 1 (visual liking:  $F = 15.27$ ,  $p < 0.001$ ; in mouth liking:  $F = 24.37$ ,  $p < 0.001$ ), pair 2 (visual liking:  $F = 9.27$ ,  $p = 0.003$ ) and pair 5 (in mouth liking:  $F = 5.28$ ,  $p = 0.023$ ).

Whether they were crunchy or soft, carrot slices always received higher liking rates than carrot sticks. As underlined above, the mean liking differences were significant in only two cases: visually, when the crunchy carrot slices were presented with the soft sticks; in mouth, when the crunchy slices were served with the crunchy stick.

The preference data (Table 3) shows that crunchy carrots were preferred to the soft one except in the case of pairs 3 and 4. In the first case, there is a significant preference for soft slices of carrots to crunchy sticks ( $p < 0.001$  for both visual and in mouth preference). In the second case, we did not observe a significant visual preference between soft and crunchy sticks of carrots ( $p = 0.405$ ).

Furthermore, the slices of carrot seemed to be visually and in mouth preferred to sticks of carrots: in pair 2, both visual and in mouth preferences were significant

(both  $p < 0.001$ ). As described previously, in pair 3 soft slices were visually and in mouth preferred to crunchy sticks.

**Table 3. Carrot's visual and in mouth liking test results**

		Visual					In mouth				
		Liking		Preference			Liking		Preference		
Pair	Product	Mean	Sd	n	Choice	p-value	Mean	Sd	n	Choice	p-value
Pair 1 (n=105)	Crunchy slice	2,2***	0,81	91	74	<b>0,000</b>	2,16***	0,83	90	60	<b>0,000</b>
	Soft slice	1,89	0,79		17		1,71	0,77		30	
Pair 2 (n=186)	Crunchy slice	2,32**	0,80	148	108	<b>0,000</b>	2,23	0,80	143	76	0,202
	Soft stick	2,14	0,83		40		2,16	0,85		67	
Pair 3 (n=71)	Soft slice	2,22	0,76	68	48	<b>0,000</b>	2,41	0,80	68	48	<b>0,000</b>
	Crunchy stick	2,20	0,69		20		2,20	0,77		20	
Pair 4 (n=97)	Soft stick	1,97	0,85	69	34	0,405	1,99	0,84	72	29	<b>0,038</b>
	Crunchy stick	2,11	0,88		35		2,16	0,82		43	
Pair 5 (n=131)	Crunchy slice	2,36	0,77	115	73	<b>0,001</b>	2,36*	0,80	119	81	<b>0,000</b>
	Crunchy stick	2,24	0,78		42		2,13	0,85		38	
Pair 6 (n=87)	Soft slice	2,39	0,75	77	48	<b>0,011</b>	2,39	0,80	77	41	0,247
	Soft stick	2,30	0,73		29		2,28	0,84		36	

\* $p < 0,05$ ; \*\* $p < 0,01$ ; \*\*\* $p < 0,001$

## Discussion and conclusion

Results showed higher liking scores and preferences for crunchy carrots confirming our first hypothesis. Furthermore, these results are in accordance with previously published research<sup>3,5,6</sup>. Concerning the shape, we observed a preference for slices of carrot, confirming our second hypothesis.

Interestingly, we observed that the preference for crunchy carrot seems to be modulated by the shape of carrots. In fact, the soft slices of carrots were preferred when they were served with crunchy sticks. Slices of carrot is one of the most common shapes served at school meaning that children were very familiar with it contrary to carrot sticks which are more unfamiliar. Several studies previously underlined that children prefer to choose foods they know<sup>7,10</sup>. Moreover, they give higher liking rates to familiar foods. In a review, Cooke<sup>8</sup> synthesizes while saying that children need to know the product to choose it and the more familiar the food the more it is appreciated. Results of the present study underlined again the importance of familiarity in the development of children's food choices and preferences. It should be interesting now to analyze results according to the age of children in order to evaluate possible differences between young and old children.

It was shown that texture preference is specific to the type of food<sup>3</sup>. It could be interesting to reproduce this test with other vegetables in order to analyze if the preference for crunchy texture is specific to carrots or if it is common to all vegetables.

In conclusion, crunchy carrots slices were most appreciated and preferred by children. However, the preference for crunchy carrots could be modulated by the familiarity of children with the shape of carrots. Our results give evidence to support the idea that it is promising to offer children crunchy and familiar carrots. Future research should better control children familiarity with vegetables in order to deeply explore the role of both sensory and familiarity factors.

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**SECTION 4 – PERSPECTIVES ON NUTRITION**

## **Menu engineering: A strategy for seniors to select healthier meal choices**

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**Keywords:** menu engineering, eldercare, nutrition, foodservice

The Montclair State University Institutional Review Board has approved this investigation. The research is actively in-process. Definitive findings will be available by the conference date.

### **Abstract**

**Objective:** The specific objective of this ongoing investigation is to assess various menu manipulations to see if they can effectively guide the older adult consumer to select the healthier food items from a menu offering meals with differing nutritional attributes.

**Methods:** One of 3 arbitrarily assigned menus and a questionnaire are being distributed to 225 senior adults living in 6 assisted living facilities in New Jersey: a generic control menu; an experimental menu, which utilized various merchandizing tools to promote the healthier menu items; and the same experimental menu with nutritional labels added. Participants rank their top 5 choices then answer a questionnaire meant to identify the impact of contextual factors such as attitude, nutritional information, and nutritional knowledge on the menu choice ranking.

**Findings:** The researchers expect to find that menu merchandizing tools and nutrition labelling can influence healthier choices for older populations.

**Implications:** Menu design has the potential to encourage healthier decisions through hidden persuaders, without impinging on the rights of elderly consumers to choose more indulgent menu options.

### **Introduction**

It has been suggested that health promotion for older adults lags behind that of other age groups, partly based on a common assumption that older adults cannot change their long-standing behaviours<sup>1</sup>. In recent years the number of citizens

over 65 in the US has been steadily increasing. Consequently, more attention has been given to the concept of health promotion for the elderly. Many seniors now live in institutional settings such as continued care retirement communities, assisted living facilities, nursing homes or some other communal arrangement. Inadequate nutrition (nutritional deficiency, under-nutrition, nutritional imbalances and excesses such as overeating) can increase the incidence and severity of diet-related diseases for older adults<sup>6</sup>. Generally, this population group has been found to be deficient in a number of nutrients including vitamin D, vitamin E, folate and calcium and B12 while high in cholesterol levels and sodium intake<sup>2,3,4,5</sup>. Dietary intake recommendations for this constituency include limited intake of red meat and salt and increased consumption of fruits, vegetables, foods containing omega-3 fatty acids and foods high in fibre<sup>7</sup>.

Dieticians and health professionals are increasingly calling for relevant, easy to adopt and effective strategies that can help promote healthy eating for older adults. Efforts to promote dietary change or to attain and maintain optimal weight (either through weight loss or weight gain) are increasingly being targeted at older adults for the prevention or management of chronic disease and in the enhancement of function and independence<sup>6</sup>. Programmatic nutritional activities include newsletters, nutrition workshops, individual counselling and sometimes the provision of meals<sup>8,9</sup>. Hands-on cooking programs and tastings have been shown to be an effective but costly tool for nutrition education<sup>9</sup>. While research has shown that the nutrition awareness programs implemented at various senior centres have had a positive impact on eating intentions<sup>7</sup>, these interventions are based on the assumption that seniors will be able to assimilate lessons learned into their dietary lifestyle – a concept that has yet to be definitively proven.

While increased access to high-quality meals has been found to increase the variety of food consumed by older people living at home<sup>7</sup>, research done at the point of consumption in institutional settings (where the seniors actually eat in congregate) has been startlingly stark. Recommendations for community eating environments have mostly targeted atmospheric improvements such as lower noise levels, more positive plate presentations and more social interactions<sup>6</sup>. Little, if any research has been done on encouraging seniors to make healthy selections from various foodservice menu options.

Older people living in congregate eldercare residences are most often totally dependent on the explicit food choices provided by these facilities<sup>6</sup>. Food preferences, choices and overall nutrition are dependent on options provided: the older consumer is limited to selecting (if a selection option is even offered) what is listed. Thus, the menu planners for these institutions have great influence on what foods are offered and then, selected by the resident seniors. This issue is subsumed in the recently published American Dietetic Association (ADA)

position paper on the foods served to the elderly residing in health care communities. The ADA calls for enhanced individualization to less restrictive diets (as therapeutic diets can be detrimental to an older adult who is at risk of under-nutrition), individual rights and freedom to choose menu items in order to increase eating desire and improve quality of life, and the addition of meaningful icons next to healthier menu options to help seniors make appropriate food choices<sup>10</sup>.

This study attempts to assess whether elders can make informed, healthy selection decisions from an array of non-restricted menu options. The specific objective is to assess various menu manipulations to see if they can effectively guide the older adult consumer to select the healthier food items from a menu offering meals with differing nutritional attributes.

The menu has been described as being one of the greatest mechanizing opportunities<sup>11,12</sup>. It is essentially a captive, non-competitive advertisement placed directly into the hands of the consumer. The consumption decision follows almost immediately. Rather than force seniors into choices they do not want, our research plan is to “nudge” them through hidden persuaders, to give specific items a little extra thought, which would result in a healthier decision<sup>13,14,15</sup>. Though research is sparse and sometimes dated, conflicting scholarly research has suggested that menu manipulations have no effect, limited effect, and substantial affect<sup>11,12,14,16</sup>.

## Methods

A generic descriptive control menu was developed from a notable trade journal<sup>17</sup> and various nationally recognized (US) chain restaurant menus. Online nutritional information from both the chain restaurant’s websites and the USDA’s National Nutrient Database for Standard Reference<sup>18</sup> were used to analyze the nutritional content of each menu item. Menu items were categorized by their healthy attributes, based primarily on calorie and fat content. The USDA Dietary Guidelines for Americans (2005)<sup>19</sup> was referenced to standardize the healthy items to recommended serving sizes. Then two experimental 2-page menus were created to determine what promotional strategies are most effective. The first experimental menu (EM) utilizes various merchandizing tools to promote the healthier food items including: the visual placement of the healthier items in 7 visual sweet spots based on previous research on gaze-motion analysis<sup>12,16</sup>. Boxes were also placed around the healthy items and menu linguistics (enticing language) was also used<sup>13</sup>. For example *Grilled Assorted Vegetables with quinoa* (on the control menu), was transformed into *Chef’s Special: A hearth-baked mélange of assorted flavourful seasoned vegetables nestled on quinoa* (on EM) then placed in a prominent menu position. Particular

healthy menu items received simple, individual merchandizing treats, while other menu items were given additional treatments to compound the merchandizing affect. For example, the only merchandizing treatment applied to *Veggie Burger with fruit salad* was boxing (as it was placed in a less conspicuous menu position). On the other hand *Grilled Assorted Vegetables with quinoa* was given compound treatments (boxing, language and premium menu positioning) to make this item more enticing. The second experimental (EMNL) utilizes the same merchandizing tools, but has calorie and total fat labels and nutritional notes added (Figure I – EMNL with gaze-motion sequence).

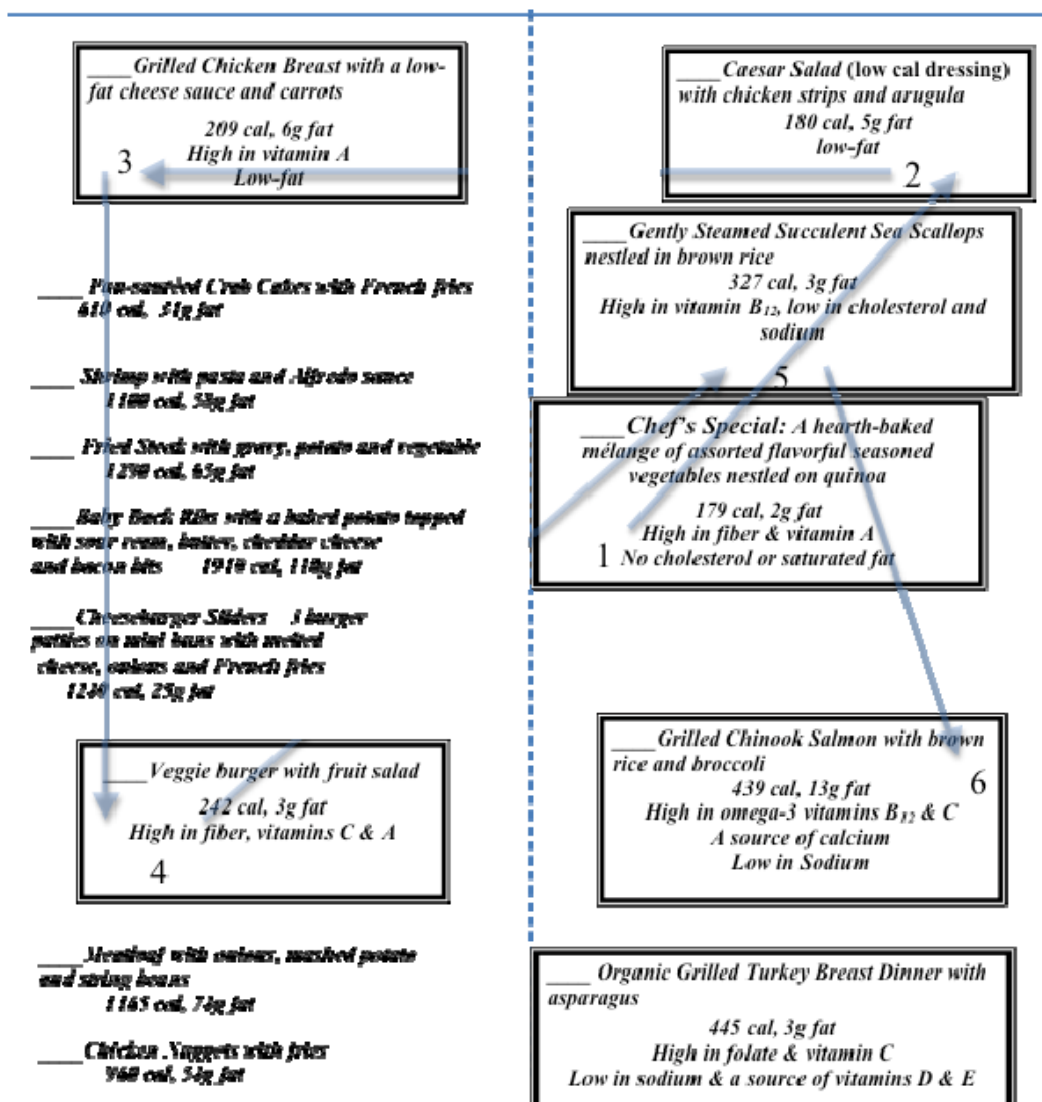


FIGURE I: Experimental Menu with Nutrition Labels (EMNL) and the gaze-motion sequence

A Likert scale questionnaire has also been developed to understand the reason behind the older adult's choices: how attitude, nutritional information, and nutritional knowledge affects the menu choice rankings. Examples of the attitude questionnaires are as follows: "I am on a diet. This influenced my menu choices;" "I am hungry. This influenced my menu choices" and "I am looking to eat low-calorie items. This influenced my selection." Examples of the nutrition information questions are: "I usually ignore nutritional information while choosing a menu item in a restaurant" and "Compared to most people, I am more confident in using nutritional information to make a choice." An example of the nutritional knowledge question is as follows: "Compared to most people, I am quite knowledgeable about nutrition." The instruments were tested on 70 Montclair State University (MSU) students in March 2010.

Through a relationship with the administration of a chain of senior care residences, the researchers have been granted permission (and approval from the MSU Institutional Review Board) to survey approximately 225 (>65 year old) residents living in six assisted living facilities in northern New Jersey. These residences all provide communal dining serves. The plan is to randomly distribute 1 of the 3 menus (Control, EM, and EMNL) plus the questionnaire to consenting older adults. Each participant will receive only one of the menus, and then will be instructed by an assisting investigator to rank 1-5 in descending order (on the designated lines next to each entree) her or his top 5 menu preferences. After ranking the menu items, each participant will be asked to fill out the questionnaire.

The menu data will be analyzed in three ways: The 1-5 preference ranking for each item will be averaged for each of the 3 menus, to track any changes in the favourability of each menu item. The selection frequency will also be tabulated for each of the menus. The researchers expect the average ranking number of the healthy items to go down (as a lower score signifies an increased favourability) when comparing the control menu to EM and then even lower when comparing EMNL to EM and the control menu. Menu merchandize tools will be examined individually and in congregate to see if they have a primary or compound affect on menu selection. Using data generated by the questionnaire, the investigators will assess the extent to which overall attitude, nutritional information, and nutritional knowledge significantly affected menu choice rankings.

### **Conclusions**

Menus designed to encourage healthy eating have the potential to influence quality of life decisions. The effects of menu manipulations, including the provision of nutritional information have yet to be fully understood. Thus far non-select menus seem to be the only tool available to ensure healthy eating by

seniors living in congregate residences. The research team believes menus designed to promote good nutrition may have the potential to encourage healthier decisions through hidden persuaders, without impinging on the right of a consumer to choose more indulgent menu options.

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## **Chefs and salt: Melting the way for glacial change?**

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**Keywords: chefs' knowledge, attitudes and behaviour, salt**

### **Abstract**

Describes part of an exploratory study into chefs' knowledge, attitudes and behaviour regarding salt. Six interviews conducted with restaurant chefs formed the basis of a questionnaire which was completed by 50 chefs. It was found that chefs had a similar level of understanding about salt and sodium to that of the general public. They were able identify high and low salt foods and knew of the Food Standards Agency (FSA), but tended not to know the recommended dietary limit for sodium. Chefs had a positive view of the taste and use of salt, but they were apathetic or negative to the idea that dietary information be made available about restaurant menu items and they were opposed to removing salt from dining tables. About one fifth of the chefs admitted to adding salt to foods before they tasted them, and about three fifths of the sample said they added salt to taste, or "when necessary". This depends on the chefs' palates, which tend to be less sensitive due to regular exposure to salt. Also, most of the chefs ate out regularly, and so were well accustomed to restaurant food.

### **Introduction**

Salt consumption in the UK has been in excess of recommended levels for at least three decades<sup>1</sup>. Recommended maximum sodium intake for adults is 2.4g a day, but for example in 2008, the average daily intake for UK males in 2008 was 4.3g, and for women 3.2g i.e. 80% and 30% higher respectively<sup>2</sup>. Excessive sodium consumption is known to contribute to hypertension, strokes and coronary heart disease<sup>1</sup>. About three quarters of the Recommended Daily Allowance (RDA) of sodium comes from processed foods and catered meals, largely from added sodium chloride<sup>3</sup>. The cost of cardiovascular disease to the UK economy, in terms of health costs, and productivity losses, was estimated at £29bn in 2004<sup>2</sup>. Reducing the average salt intake of the population is likely to decrease the burden of hypertension and improve public health<sup>1</sup>. The Food Standards Agency (FSA) advocates sodium reduction in foods as a cost-effective strategy to improve public health and is encouraging the British food

industry to reduce sodium in processed foods<sup>4</sup>. However, relatively little is known about the catering industry's impact, especially that of restaurants. The present study examined the attitudes and behaviour of chefs in regard to salt.

## Background

According to Mintel's 'Eating Out Review' fast foods and takeaways, together with dining out are consumers' top spending priorities after paying household bills, despite the recession<sup>5</sup>. The Healthy Catering Manual<sup>6</sup> advises caterers not to add salt during cooking and to minimise the use of stock cubes, packet mixes and other salty ingredients and the FSA are currently working with catering organisations to promote healthier catering<sup>7</sup>. In November 2009 the FSA received commitments from five of the leading fast food chains to make their products healthier, *inter alia*, in terms of salt content<sup>8</sup>. However, much of the commercial catering sector consists of small companies and is difficult to reach with such initiatives<sup>9,10</sup>.

Attitudes of commercial caterers towards nutrition have always been ambiguous, and in the end the composition and preparation of food depends upon the education, attitudes and behaviour of cooks and chefs. Despite pressure from various bodies concerned with the nation's health, nutrition is not taught on National Vocational Qualification (NVQ) courses<sup>11</sup>. Education is known to have a beneficial effect upon chefs' behaviour, but currently the most effective way to encourage change is through customers' demands. In fact, a study by Eves *et al.* found that most chefs believed that it was their role to influence customers' choices<sup>11</sup>. Most of the chefs in a study by Bull and Wise<sup>12</sup> had received nutritional training, had a positive attitude towards "healthy" eating and had modified the fat content of some recipes according to dietary guidelines. However, no mention was made of salt in this study and there has been no research into restaurant chefs' knowledge and attitudes regarding salt.

Consumer understanding of dietary salt is reported to be limited, partly due to confusion between "salt" and "sodium" in guidelines and reports<sup>13</sup>. However, consumers tend to take an interest in all aspects of healthy eating and readily receive dietary information. The FSA recently reported that consumers understand the health consequences of eating too much salt, but are not aware that sodium is the factor that causes harm if eaten in large quantities<sup>14</sup>. The human palate becomes desensitised if it is exposed to much salt, and this effect has been attributed for example to eating fast food<sup>15</sup>. A study by Grimes *et al.*<sup>3</sup> found that 88% of people surveyed knew of the relationship between salt intake and high blood pressure, but 65% did not correctly identify the relationship between salt and sodium. About half of this sample was unable to use labelled sodium information accurately to pick low salt options<sup>3</sup>. Salt use is cultural, and

children from an early age may acquire the habit of adding salt to their food, even before tasting it<sup>4</sup>.

## **Method**

Six semi-structured interviews were conducted with qualified chefs, who mostly held the post of head chef and had a minimum of 5 years experience including their training. Interviews were conducted at the workplace at the chefs' request, and lasted between fifteen minutes and half an hour. They were recorded, transcribed and analysed in order to produce a short survey questionnaire. This was designed so that it could be completed in 5 minutes and would not impact noticeably upon respondents' time. It was administered to 50 restaurant chefs at their place of work. Completed questionnaires were collected immediately, achieving 100% response. The resulting data were entered into a database and analysed using SPSS 16.

## **Results**

The interview phase of the research identified three key areas, namely chefs' knowledge, attitudes and behaviour. Key factors were their suppressed creativity, especially in relation to seasoning food, knowing and also defining "what customers wanted". They claimed nutritional knowledge, but did not spontaneously mention salt in this context unless prompted. They also provided a great deal of useful contextual information, for instance about the length and scope of the questionnaire, if it was to be successfully completed. The instrument produced from the interview analysis had ten questions, two of which asked for demographic details. The remaining eight were grouped into Knowledge (3), Attitude (3) and Behaviour (2).

### ***Knowledge***

Have you ever heard of the FSA? 40 yes, 10 no

Do you know the current guidelines regarding daily salt intakes in the UK? 9 yes, 41 no

Four tests, in each of which four foods were ranked in order of salt content. Four correct 46, three correct 0, two correct 3, none correct 1

### ***Attitude***

Do you like the taste of salt? Yes 38, no 12

When eating out would you like to see some kind of guidance with regard to salt content of dishes on the menu? Yes 27, no 8, not bothered 15.

Do you think caterers should remove salt from the tables so consumers cannot add any more salt to prepared dishes. Yes 5, No 37, Undecided 8.

***Behaviour***

Results from this section are presented in tables 1 and 2 below:

**Table 1: Which best describes your use of salt [in restaurant food production]**

Response choice	N
I always add salt to my food before tasting	11
I always taste my food before adding salt	11
I sometimes add salt to my food but only when it's really needed	19
I never add salt to my food	9
Total	50

**Table 2: How often do you eat out?**

Response choice	N
Less than once a month	3
Twice a month	10
once a week	13
Twice a week	10
More than a twice a week	14
Total	50

**Discussion**

In principle the industry provides what it thinks the customer wants, but this assessment does not necessarily keep pace with actual market trends, nor with the recommendations of bodies concerned with the nation's health. Chefs were

aware of the FSA but not of its recommendations relating to salt. This is not particularly surprising, given that other studies have shown that salt and sodium are regarded as a lesser risk, compared with fat and sugars<sup>11,17</sup>. Chefs were generally able to rank foods in order of salt content. However one wonders whether the outcome would have been the same had the question asked for “sodium content” or whether they would have been able to interpret the relevant nutritional data on foodstuff packets. In this respect it would have been interesting to have some comparison with the study reported by Grimes et al.<sup>3</sup>.

As expected, chefs were positively disposed to the taste of salt as an additive in food. About half of them felt there should be guidance about salt in restaurant food for customers, but still nearly a third were apathetic and nearly a fifth were against providing such guidance. As expected, most of them were in favour of leaving salt on tables for customers to help themselves, but this must be more a matter of tradition than ideology, since chefs are known to consider their output complete and further seasoning unnecessary.

The findings relating to chefs’ behaviour are surprising. Chefs are taught to always taste what they produce, and especially to check the seasoning. The fact that nearly a quarter of the sample added salt before they tasted it seems to go against this basic principle. Similarly interesting are the one fifth of respondents who never add salt, as this not only flouts basic training but also the requirements of most recipes. Those who tasted before adding salt or who only added it if “really needed” formed the majority (two fifths of the sample) and were essentially answering the same question. It was also informative that chefs often ate out, almost half of them twice a week or more. This would make them particularly aware of the nature of restaurant food and in theory should alert them to the typical high salt levels. However, repeated use of salt accustoms the taste<sup>15</sup> and this may especially affect chefs, who continually have to taste their output are especially at risk. This means they may not notice high salt content when they eat out, and may indeed consider it appropriate in restaurant food.

In summary, a number of factors weigh against the control of salt in restaurant food. Chefs consider their first duty to provide an attractive, rather than a predominantly healthy product. They regard themselves as responsible for influencing what their customers eat, but are not necessarily in touch with customers’ health preferences. The general level of understanding of dietary salt and sodium is poor in the population as a whole and given that nutrition is not taught on many catering courses, the level of chefs’ understanding is unlikely to be higher.

## Conclusions

This paper describes part of an exploratory study into chefs' knowledge, attitudes and behaviour with regard to salt. Chefs appear to be similar to the general population in terms their level of understanding about salt and sodium, which is not unexpected, given that nutrition is poorly represented in catering course curricula. Thus on the whole the chefs were able identify high and low salt foods and knew of FSA, but tended not to know the recommended dietary limit for sodium. As might be expected chefs had a positive view of the taste and use of salt, but they were apathetic or negative to the idea that dietary information be made available about restaurant menu items. Chefs were generally opposed to removing salt from dining tables, even on the basis that their food was served perfectly seasoned. About one fifth of the chefs admitted to adding salt to foods before they had tasted them, and about three fifths of the sample said they added salt to taste, or "when necessary". However, one should factor in the regular exposure of chefs to salt, which tends to make the palate less sensitive toward it: "when necessary" depends upon this perception and is likely to be more frequent than for members of the general public. This is further supported by the fact that most of the chefs ate out regularly, and so were well accustomed to restaurant food.

This information should be of interest both to chefs and to catering/ restaurant managers, as there are no published studies of chefs' attitudes and behaviour with salt. However, in order to gain the chefs' co-operation the study method was very limited and the data presented here need further explanation and illumination. This might be done by participant observation, or perhaps through an action research case study, which would allow the researcher to gain the chefs' trust and hence to gather richer, more extensive data.

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## **Nutritional and health benefits of foods as determinants of purchase decision of Polish consumers**

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**Keywords: consumer, labelling, nutrition and health information, food choice**

### **Abstract**

**Objective and method:** The goal of the study was to find out how nutritional value and health-related attributes of foods affect consumers' dietary choices and shopping behaviour. The study was carried out using the questionnaire method on a sample of 200 consumers – inhabitants of Poland's capital city. The majority of them were young, well-educated and almost equally divided into four income groups.

**Results:** The study showed that only 12% of the consumers never took into consideration the health impact of purchased foods, while 42% were deeply aware of it. This behaviour was the only one significantly influenced by consumer income, while the others were determined by education level and gender. Consumers revealed that food labels had rather low influence on purchase decisions. Half of them always looked for obligatory information such as brand, producer, expiry date, or price, and only 2% of the sample never looked. In contrast, only 3-6% always checked the product's description, nutrition facts, and nutritional or health claims, while 1/3 of the group never did that. Consumers looking for this information (with different frequency) were interested mostly in energy value, total fat content, and presence of additives. The smallest attention was paid to trans and saturated fatty acids' content. This behaviour was in line with generally low understanding of these fat components' impact on health. Health claims' perception differed depending on the type of claim: the highest regarded was lowering cholesterol level, followed by natural product, and providing immunity. However only 1/3 of the group declared that health claims influenced their purchase decision and the same proportion negated the impact. The perception of GDA labelling scheme and "My choice" logo was even lower, so this information had very limited influence on food choice.



**Conclusions:** Nutritional and healthy value of foods was found to be rather weak determinants of purchase decision and food choice. Consumers should have better knowledge on food-nutrition-health linkages and different labelling formats. Otherwise nutritional marketing instruments are not useful in making healthy, informed food choice.

## **Introduction**

Many studies carried out in this decade in EU-15 countries<sup>1</sup> and in Poland<sup>2, 3, 4</sup> showed that European food consumers are increasingly interested in health and a healthy lifestyle where the awareness of food, nutrition and health linkages is evident. There's much more interest in healthy food like fruit and vegetables, fish, and wholegrain products than before. People are trying to cut down on the consumption of sugar, salt, fat and artificial additives and increase intake of dietary fibre, vitamins and minerals. At the same time, paradoxically, the increase of obesity and other diet-related diseases is observed. These circumstances induced the governments, food companies, food retailers, and international and European Union institutions involved in public health nutrition to help consumers make healthy, informed food choices. One of the solutions is to give the consumer the set of right information, delivered clearly and simply on the food packaging. The exposure of the Polish consumers to nutritional marketing tools, including nutrition labelling and other nutrition and health claims and information on food labels is continuously evolving. According to the FLABEL project findings nutrition facts are displayed on back-of-pack on approximately 85% of audited products in Poland and on front-of-pack on almost 40%, despite the fact that the provision of this information is not compulsory in the European Union unless a nutrition or health claim is made. This data are very close to the average value obtained for all EU member countries. The GDA system was the most prevalent form of front-of-pack nutrition information. Poland having 30% of audited products labelled with GDA information was situated in seventh position among all surveyed countries<sup>5</sup>.

## **Aim and method**

The aim of the study was to check the influence of nutritional and pro-healthy benefits of food and relevant information on food labels on purchase decision making within the group. Interviews were carried out among 200 consumers chosen with a snow-ball sampling method in Warsaw in 2009. The percentage of women and men in the group was equal. The method of sampling determined socio-demographic characteristics of the consumers, which were as follows:

- Almost 2/3 of the interviewees (65%) were young people between 21 and 30 years of age. The second biggest group were respondents in the age of 31 - 40 years old (16%), and people over 40 to 60 years old (divided into two groups 41-50 and 51-60) constituted 19% of the sample.
- About 55% of consumers had secondary education, and the others had higher/university degree.
- Students prevailed in the group (48%), followed by white collar workers (40%), and physically working people, people who didn't work voluntarily, and self-employed, constituting together the remaining 12% of the group.
- Respondents were almost equally divided into 4 income groups, which obtained respectively a monthly income per person in the household up to PLN 1000, and in the ranges of 1001-1550, 1501-2000, and over 2000.

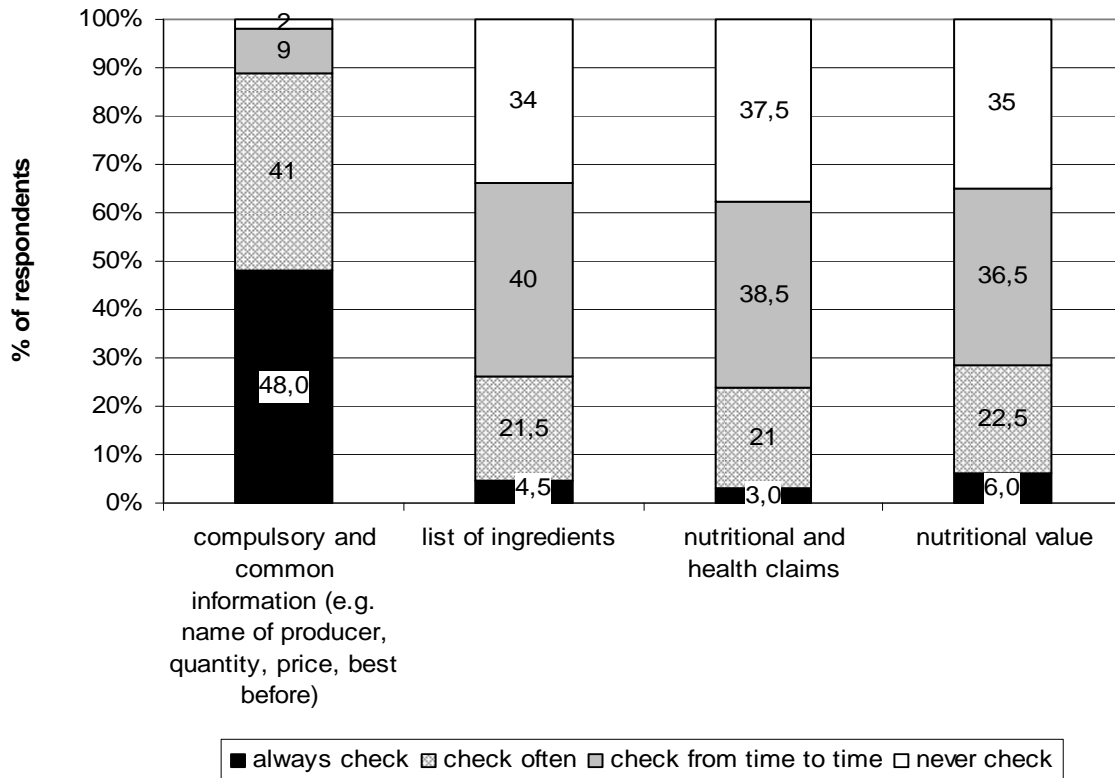
## **Results and discussion**

The interviewed consumers could be described as people interested in nutrition and health issues because only 22% of them do not care about these aspects (7% not at all and 15% rather not). Significantly more women than men were interested in nutrition and health linkages ( $p < 0.001$ ) as well as more respondents with higher education level ( $p = 0.004$ ).

The majority of the sample declared that they take into consideration health benefits of the products when making food choice; 7% always follows this rule, 35% often, 46% from time to time, so for 12% it is not an issue. This behaviour was determined by consumer income ( $p = 0.007$ ) and the variables changed in the same direction.

In the light of the study, packages and labels were not perceived as a good source of such information. During shopping consumers were mostly interested in compulsory and common indications such as the name of producer, quantity, price, and expiry date (Figure 1). Almost half of the respondents always checked this information, while only a few percent of the group always checked the ingredient list, nutrition information and information regarding nutritional and health benefits of the product. Significantly more women than men noticed the list of ingredients ( $p = 0.001$ ), nutrition grid ( $p < 0.001$ ), and claims ( $p < 0.001$ ), which corresponds with previous results. Ingredients and nutritional value of the product were checked by significantly more respondents with a higher education level. Moreover high income consumers were more interested in the list of ingredients compared to low income ones (in each case  $p = 0.004$ ).

**Figure 1. Checking different information on food label, % of respondents**



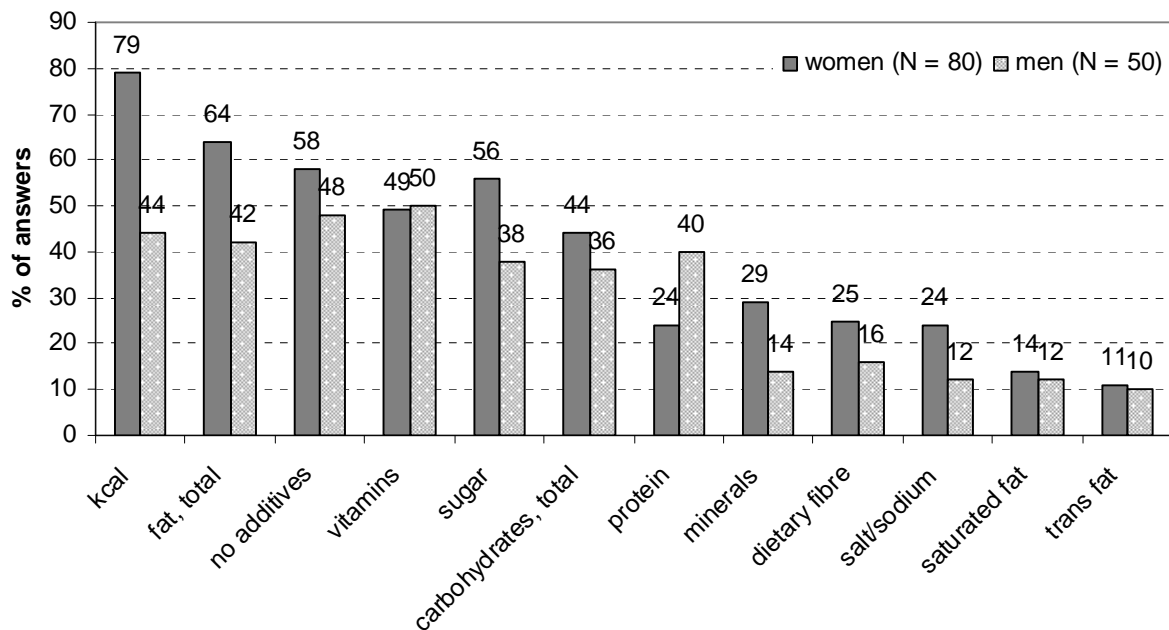
For checking nutrition information Grunert et al.<sup>6</sup> received higher data. In the study conducted in six European countries (UK, Sweden, France, Germany, Poland and Hungary) across six product categories, on average 16.8% of shoppers were found to have looked for nutrition information on the label. There was considerable variation over countries: shoppers were most likely to look for nutrition information in the UK (27%), 13.8% in Poland, and the least likely in France (8.8%). Also in the Nielsen (2008) worldwide survey it was found that around a quarter (24%) of the world’s shoppers always check the nutritional information on the package and 37% check when considering purchasing a product for the first time. In the European countries the data were lower and amounted respectively to 18 and 34%. Grunert and Wills<sup>1</sup> pointed out that in other studies, the percentages declaring to check nutrition information are correspondingly high, so such figures should be interpreted with caution. Moreover it may not always be clear to respondents what the term “nutrition information” means as some consumers are known to confuse nutrition information with ingredient list or nutrition claims, which are designed to attract attention to a much higher degree than nutrition grids.

The interviewed Polish respondents were mostly interested in energy value of the products (together 65% of these who reported checking nutrition information, with different frequency), which was followed by fat content (55%), and presence of artificial additives such as preservatives or colouring

(54%). Almost half of the group used to check vitamin and sugar contents. The lowest number of the consumers looked for amount of saturated and trans fat (13 and 11%, respectively). Only one in five checked sodium content, or one in eight, if the whole sample of consumers was taken into consideration. It should be stressed that the intake of sodium in the Polish population (representative sample) exceeds the WHO recommendation by over 50%. However the exceeding of daily allowances considerably differs by consumer groups and reaches even ten-fold higher intake<sup>2,7</sup>. According to Nielsen's<sup>8</sup> global report on nutritional labelling, fat is also at the top of consumers' hit list, with 48% always checking for it (47% in Europe). After fat, calories are the most checked for on a nutritional label (45%), followed by preservatives (42%) and sugar (41%). In the European survey of Grunert et al.<sup>6</sup> vitamins and food additives (colours, preservatives, E-numbers) are most often looked for in Poland, by 26 and 32% of consumers, respectively. For the other five countries taking part in the survey the data was several times lower, in the case of vitamins the least in UK (3%), and additives in Sweden (7%).

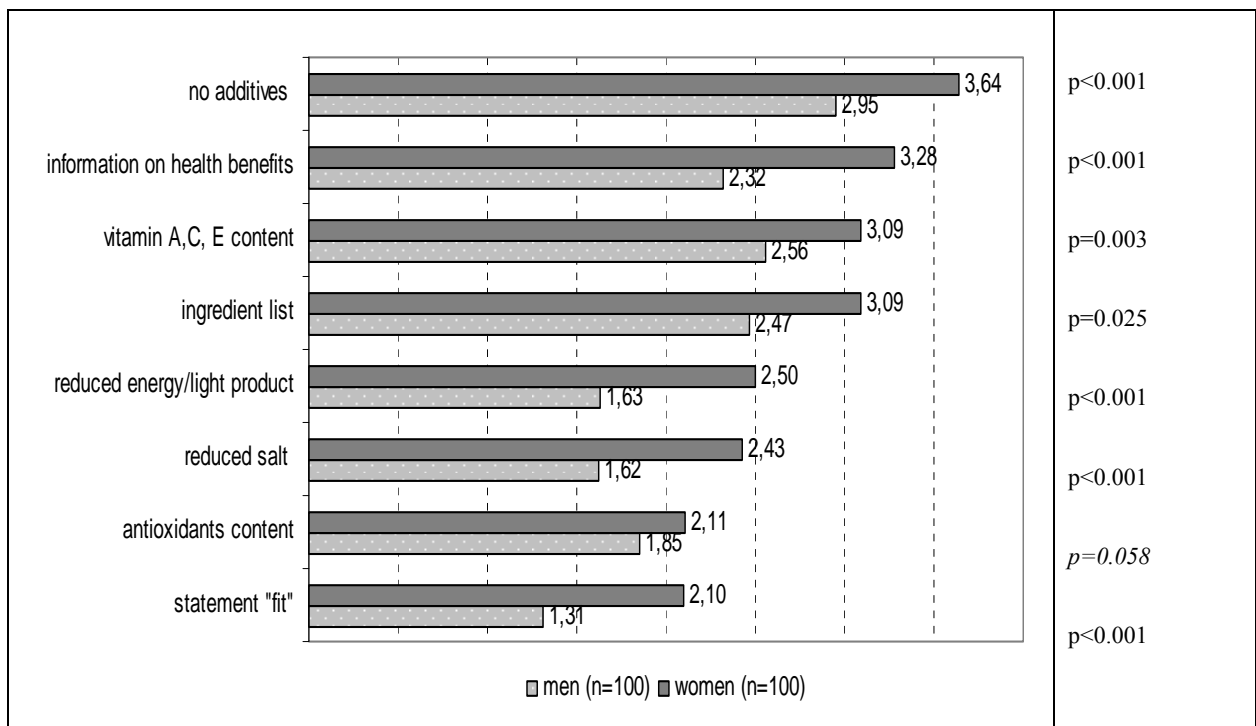
The study showed that significantly more women than men checked the content of calories, fat, sugar, minerals, fibre and salt, whereas protein content was more important for men (Figure 2).

**Figure 2. Checking nutrition information on the food label by interviewed women and men, % of answers**



The presence of additives is still an important message for the consumers, as they placed this information at the top making the hierarchy of 8 given nutritional factors which could be decisive while purchasing food. The average score equalled 3.28 in a 5-point scale and was followed by vitamin A, C, and E content, ingredient list, and health benefits of the product (2.81, 2.77 and 2.76, respectively). Consumers recognized as unimportant information regarding lower energy value, reduction of salt, and antioxidants content. The statement “fit” on a label occurred to be of least importance. These findings confirmed that the consumers’ knowledge of food and health linkages is rather smattering and based on false stereotypes (e.g. antioxidants as vitamin A, C, E are very common additives in food processing). Women evaluated the role of nutritional factors significantly higher in food choice decision, on average by 0.7 (Figure 3).

**Figure 3. Ranking of the given nutritional determinants which could be decisive while purchasing food according to gender of respondents (5-point scale, where 5 - very important, 1 - not important)**



The understanding of nutrition information was checked in the case of 13 nutrients which are shown on the food label predominantly. The largest number of consumers (86-81%) declared that the terms sugar, fat, vitamins, and calories were clear for them. These nutrients content also topped the perception of

information on the label while shopping for food (over 70% of the sample). Two in three respondents reported understanding the terms calcium (67%), fibre (63%), and cholesterol (65%), while the perception of information about them shown on a label was lower (56, 51, and 39%, respectively). In both cases consumers placed different types of fat at the end of the list. The smallest number understand the trans fat term (16%), and half of them noticed on the label the information on trans fat content.

For those respondents who declared understanding of a given nutrient term the influence of information on its content on purchase decision was evaluated. The content of vitamins, total fat, calories and fibre was evaluated as important in food choice (weighted-averages over 3.00 in 5-point scale), while other nutrients reached lower marks (between 2.53 and 2.85), being the information of mean importance. These findings confirmed that while shopping food consumers took into consideration the content of these nutrients which are known to them (sugar, vitamins, fat, and calories). In general gender and education level were the variables which significantly influenced the understanding of nutrient terms (Table. 1), the perception of information on the content in foods, and the impact of this information on purchase decision. Generally in many studies it is reported that gender and better education level tend to be associated with wider knowledge and higher involvement in food, nutrition and health issues, including the nutrition label.

As an increasing number of food products are sold using marketing claims, the perception of nutritional and health claims were surveyed. The majority of the consumers declared familiarity with claims that its lowers the cholesterol level (74%), is natural (72%), or boosts immunity (70%). More than half of them noticed claims regarding better condition of skeleton and higher intellectual efficiency. The next were claims concerning better functioning of digestive system and heart benefits (47 and 44%, respectively). Even though the perception of such the claims was rather high, only 37% of the respondents chose food products taking them into consideration and almost the same number stressed that claims are not effective in food choice. Significantly fewer consumers with higher education level made a purchase decision influenced by claims regarding health and nutrition. Probably these consumers trust themselves more in the case of food, nutrition and health knowledge comparing to nutritional marketing tools used by food producers. Sosinska et al.<sup>9</sup> found in their study that 2/3 of respondents declared more frequent purchase of healthy food if they had better knowledge about it and simultaneously almost the same number was convinced of health benefits of functional foods.

**Table 1. Understanding of terms of nutrients in relation to gender and education level of the respondents, % of answers**

Nutrient	Gender			Education level		
	Women (%)	Men (%)	p	Seco-ndary (%)	College and higher (%)	p
Sugar	91	80	0.027	81	91	0.047
Vitamins	89	82	0.161	83	89	0.242
Fat, total	88	79	0.087	78	91	0.010
Energy value	84	78	0.281	78	84	0.293
Calcium	73	61	0.071	61	74	0.054
Cholesterol	72	57	0.026	59	72	0.050
Dietary fibre	74	52	0.001	58	70	0.081
Sodium/salt	64	41	0.001	45	62	0.018
Special micofora in milk drink/probiotics	57	37	0.004	35	62	<0.001
Omega-3 and omega-6 fat	43	24	0.004	23	46	<0.001
Unsaturated fat	36	25	0.092	22	42	0.002
Saturated fat	27	18	0.128	16	30	0.017
Trans fat	20	12	0.124	9	25	0.002

More recently, various front-of-pack nutrition labelling schemes have emerged such as the Traffic Lights scheme, GDA, or health stamps such as the Swedish Keyhole and “My choice”, to provide consumers with nutrition information that is easy to access while shopping. Two of them are most prevalent in Poland: GDA and “My choice”. However the perception of these tools is rather low. “My choice” logo was noticed by 18% of respondents, and GDA symbols by 43%. Up to May 2010, the “My choice” stamp was placed on about 110 food products supplied by eight food companies which decided to participate in

“choices” foundation program for a fee. GDA was introduced for free and is disseminated by CIAA at the European Community level and its members, branch NGOs at a national level in member countries. However “My choice” symbol appeared to be more effective than GDA in inducing consumer to buy the product labelled with these signs. The influence of “My choice” symbol was declared by 40% of the consumers who have seen it, while of GDA, 24% stated it. Moreover only 30% of the interviewing consumers look for GDA label, in which 3% always, 8% often, and the rest sometimes. Probably better evaluation of “My choice” symbol was the result of its simplicity, as the logo unequivocally indicates that the product is a healthy choice within a food category. In order to get the stamp, the product must meet specific criteria regarding content of the nutrients which are the major risk factors in prevalence of diet-related chronic diseases. In the case of GDA the consumer has to calculate themselves the appropriate amount of each product to balance the daily diet.

## Conclusions

The study shows widespread consumer interest in nutrition and health properties of food. Part of them has an interest in making a healthy food choice and in the majority this attitude characterizes women and consumers with better education level. Respondent’s knowledge of food, nutrition and health issues was found as basic and rough so it could not motivate them to purchase more healthy foods. In this light, food producers who promote products with nutritional marketing tools face a communication barrier with consumers. In order to help consumers make a proper food choice and to prevent disadvantageous trends in prevalence of diet-related diseases it is essential to undertake different activities in the field of consumer education aimed at improving consumer knowledge and awareness of nutrition and health linkages.

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## **Well-being in the workplace – point-of-purchase nutrition information and its influence on menu choice**

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**Keywords: nutrition, menus, workplace, foodservice**

Permission was sought and granted by Bournemouth University Research Ethics Committee to conduct this research.

### **Abstract**

The potential of the workforce and its ability to develop have become the subject of a new understanding of health, which encompasses both physical and mental well-being. Many companies provide employees with information on healthy lifestyles and actively encourage positive food choice within the staff restaurant. The aim of this research was to evaluate the influence of nutritional information on menu choice in a workforce setting using two different presentation styles, one in the form of Kilocalorie counts and the other in the form of an established healthy eating symbol. Results demonstrate that despite positive qualitative feedback, quantitative data would suggest no significance difference between selection of labelled and unlabelled dishes. In addition, respondents showed no preference for numbers or symbols; both were equally ignored. It is evident that provision of nutrition information is only useful for those individuals who are highly motivated to utilise this intelligence during their judgement and decision making process.

### **Background**

Promoting health at the workplace improves the working environment and is beneficial for society, companies and employees alike<sup>1</sup>. The workplace offers a significant setting to promote a healthy lifestyle especially as 60% of adult waking hours are spent at work<sup>2</sup>. In the UK, 18% of the total eating out market is from institutional/social catering<sup>3</sup>, which is defined as work, hospitals or school canteens where the customer base is the same everyday and where food

intake contributes to a significant portion of the daily calorie intake. It is estimated that a third of meals served by caterers in England are provided by this public sector, equating to £2 billion a year<sup>3</sup>. Hence, a Healthier Food Mark scheme has been launched by the Department of Health<sup>4</sup> to encourage voluntary standards within this sector for nutritional quality and sustainability of food provided.

Compared to meals prepared at home, restaurant meals tend to contain more calories, total fat and saturated fat<sup>5</sup>. It is predicted that if the levels of obesity continue to rise at the current rate, by 2050 nine in ten adults and two-thirds of children in the UK will be at risk<sup>6</sup>. Clearly this is a major public health challenge; where the food service industry has been seen as a collaborator, influencing and encouraging an obesogenic environment. Unlike retail food products, many restaurant menus lack the type of nutritional information that can guide diners to make appropriate healthy choices. Recently the spotlight has been on eating out where a voluntary nutritional labelling trial scheme has been running in the UK and a compulsory requirement instigated in New York City. Baseline data collected for evaluation of the latter demonstrated that the average lunch time purchase was 827 calories with 34% of consumers purchasing more than 1000 calories, predominantly from beef burger chains<sup>7</sup>. Subsequent Federal US legislation, The Patient Protection and Affordable Care Act 2010, requires restaurant chains with more than 20 outlets to post calories counts on menus, drive through displays and vending machines for all the food items that they sell<sup>8</sup>. However, making calories more visible does not seem to have a significant impact on food purchase, where information is not seen by two-thirds and ignored by more than half of those who do observe the advice<sup>7</sup>.

Evaluation of the UK experience similarly suggests that calorie data was found most useful when it is clearly visible but rather like in the US, use and therefore influence and impact on food choice was low<sup>9</sup>. Overall positive feedback was received from the organisations that took part although three major concerns were identified especially for small independent operators: how to obtain calorie information, how to decide which products to put the information on and deciding where and how to display the information<sup>9</sup>. Another programme currently operating across the UK is the Heartbeat Award Scheme, launched as part of the national strategy to reduce the incidence of coronary heart disease through improved access to healthy food<sup>10</sup>. It is an award system that is given to catering outlets based upon the amount of 'healthy' options available on the menu, training of food handling staff and detailed food hygiene criteria. Unfortunately, whilst it has been demonstrated that premises with this award are more committed to the provision of healthy dishes it is not possible to draw conclusions about the impact of the scheme on eating habits<sup>11</sup>. Notwithstanding, the style in which nutritional guidance is presented is open to debate and forms

the focus of this study. There has been a rise in the number of symbols appearing on food packaging, which could be confusing to consumers. However, in focus groups participants have reported that information giving a general impression of nutritional value rather than precise figures would be more acceptable, too much information is confusing and counting calories antisocial<sup>12</sup>. The aim of this research is therefore to evaluate the influence of nutritional information on menus in a staff restaurant using two different styles, one in the form of total numbers of Kilocalories and the other in the form of a symbol.

## Methods

The research for this study was carried out during autumn, 2009 at lunch time in a workplace restaurant operated by staff and students at Bournemouth University, serving 80 covers, per day. The style of service and food consumption is that typically found in a workplace cafeteria with customers self-selecting their dishes from the service counter according to their appetite and taste. Staff have the opportunity of choosing from three main meals in addition to other lighter snacks and beverages. The menu is written on a large blackboard (chalkboard) positioned outside the cafeteria and also at the start of the service line. Observation, kitchen records and unstructured interviews were used to establish food preparation methods and kitchen practices. The restaurant recipes, methods and standard or average portion sizes were then used to calculate nutrient composition.

Fifteen main course dishes, three each day for a week were tracked over a four week period, where each week the sales mix was collated and analysed. The weekly menu rotation remained consistent throughout the study period. Week one the menu presentation was not changed and provided a control, week two the three main meals had the addition of nutrition information in the form of kilocalorie counts, week three a heart symbol was added to represent the healthiest of the three main meals and week four the menu presentation returned to the control situation. The 'heart symbol' used to denote the 'healthy' dish was selected as this is easily recognisable and familiar being part of the HeartBeat Award Scheme; the 'sign' that is the imagery used and the 'meaning', how the recipient interprets the message were important considerations in selection of appropriate symbol. Casual interviews (n=12) were conducted in order to gain a deeper appreciation of consumer understanding and attitude towards menu nutritional labelling. Participants (n=12 female n=8, male n=4) were staff employed by Bournemouth University who used the staff restaurant at least once a week.

Data were also collected from the sales mix and the number of each dish sold was calculated from the total, this was then presented as a percentage of the total dishes.

**Data analysis**

Qualitative data were analysed for pattern and meaning allowing for developing themes to be identified. Nutritional analysis was undertaken using the computer program ‘Microdiet (version 2)’ where total dish kilocalorie count was identified and the ‘healthiest’ option ascertained by least fat content (g). This information was presented on the menu for the appropriate study week. Data were inputted into SPSS and paired sample T tests conducted in order to compare the value of means. Statistical significance at  $p \leq 0.05$  was used for all tests.

**Results**

The common themes found from the semi-structured interviews were evaluated using content analysis and can be summarised in the categories of ‘understanding’, ‘consumer engagement’ and ‘visibility’. Details of responses are presented at Table 1.

**Table 1. Thematic hierarchical analysis of consumer interviews**

Level 1	Level 2
Use of nutritional information – increasingly evident and used to seeing it	<b>Understanding</b>
Kilocalories – understanding is important	
Healthy diet – personal choice or not	<b>Consumer engagement</b>
Identification – people would look for calorie information if more widespread on menus	
Dish selection – information clear and easy to use at point of purchase	<b>Visibility</b>
Colourful	
Simplicity	

Data analysis of dish composition and labelling values are presented at Table 2 where details of sales mix are also presented. Taking total column means into account there were no significant differences between weeks Control 1 and Control 2, Control and Kilocalories, Control and Symbols and Kilocalories and Symbols. However, evaluating specific dishes some anomalies did arise and significant differences are indicated. From the figures it can be seen that Lamb Hotpot, which was not labelled as healthy, was selected more before labelling than after. Courgette and tomato pasta and battered cod, labelled as the healthier dish were selected more during the labelling weeks while results for roast chicken demonstrate no obvious trend.

**Table 2. Dish analysis and sales mix**

Dish Choice	Total Kcal Per portion	Total Fat (g) Per portion	Portions Served							
			Week 1 - Control		Week 2 - Kcal label		Week 3 - Symbol		Week 4 - Control	
			No	%	No.	%	No	%	No	%
<b>MONDAY</b>										
Steak & Ale Pie	906	59	26	7	33	9	29	7	29	8
Haddock Florentine	397	22	20	5	26	7	33	8	21	5
Vegetable Moussaka ♥	297	19	25	7	22	6	30	8	30	8
<b>TUESDAY</b>										
Chicken Chasseur ♥	206	7	35	9	37	9	27	7	41	11
Fish Pie	669	43	34	9	30	8	35	9	45	12
Spinach Cannelloni	451	23	22	6	21	5	25	6	36	9
<b>WEDNESDAY</b>										
Lamb Hotpot	962	86	46	12 <sup>ab</sup> <sub>c</sub>	27	7 <sup>a</sup>	30	8 <sup>b</sup>	30	8 <sup>c</sup>
Stuffed Sea Bass	487	28	20	5	18	5	16	4	20	5

Courgette & Tomato Pasta ♥	373	16	9	2 <sup>ab</sup>	18	5 <sup>ac</sup>	19	5 <sup>bd</sup>	6	2 <sup>cd</sup>
<b>THURSDAY</b>										
Swedish Meatballs	916	87	33	9	32	8	27	7	24	6
Roast Chicken ♥	409	22	2	1 <sup>ab</sup>	23	6 <sup>ac</sup>	9	2 <sup>cd</sup>	26	7 <sup>bd</sup>
Broccoli & Stilton Quiche	897	77	25	7	14	4	25	6	24	6
<b>FRIDAY</b>										
Battered Cod ♥	226	28	35	9 <sup>abc</sup>	47	12 <sup>ae</sup>	51	13 <sup>bd</sup>	10	3 <sup>cde</sup>
Beef Lasagne	756	42	38	10	31	8	29	7	28	7
Butternut Squash Risotto	814	45	5	1	6	2	9	2	12	3
<b>TOTAL</b>	906	59	37	5	100	385	10	39	4	100

### ♥ Healthiest Dish

Pairs of superscript letters denote significant differences ( $p \leq 0.05$ ) across rows

### Discussion

Workplace restaurants are increasingly being identified as environments where better lifestyle habits can be promoted, although, it is also accepted that not all consumers will wish to engage in this positive change; it depends on health-related attitude and behaviour<sup>13</sup>. Nevertheless, some such as the ‘Strugglers’ who would like to make changes to their lifestyle but need gentle persuasion, ‘Happy Healthies’ who are health committed, ‘Natural Alternatives’ who are actively maintaining their healthy lifestyle, and ‘Persistent Strivers’ who have lifestyle problems but are willing to put in the effort to make changes will all benefit from greater nutritional signposting. While for the ‘Fatalists’ who are the most likely to consume unhealthy foods and are not willing to make changes any labelling will have limited effect<sup>13</sup>. From the results of this small study it is evident that for the most, provision of nutritional information made very little difference to dish selection and there was no discernable difference between kilocalorie and symbol labelling. Consumers reported that calorie information was most useful when it was easily visible, and as menu labelling schemes become more widespread, awareness will increase. Respondents were positive

in their comments towards nutritional labelling; however this was not translated into dish selection. Although it is interesting to note that labelling courgette pasta as 'healthy' increased sales, while coincidentally sales of lamb hotpot, unlabelled, decreased.

While it is evident that public concern over health related issues such as the amount of fat and sugar in foods has risen considerably, the rising levels of obesity indicate that average energy intakes are currently exceeding consumer requirements<sup>14</sup>. Therefore, any initiative provided by staff restaurants that informs and encourages better decision making among motivated employees could play a large role in a healthier workforce.

## Conclusion

Providing nutritional information in small independent restaurants may be challenging but helpful, however, the task is easier where menus are standardised and repeated such as in a workplace environment. Nevertheless, no labelling system or legislation can control choice made by individuals, the responsibility for a healthy selection must always remain personal.

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**SECTION 5 – FOOD AND TOURISM**

## **“I am not at risk”: Food risk is higher for “typical tourists” than for me**

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**Keywords:** food risk, subjective judgements, illusion of control, typical tourists

### **Abstract**

The present research aimed at studying the relationship between judgements of risks to one self as a tourist as compared to the attributed risks to “typical” and “average” tourists. Altogether 1892 tourists to Norway (summer of 2010) filled in a questionnaire on aspects of being a tourist. Respondents were randomly assigned to one of four groups, in each of which the main bulk of the questionnaire differed in focus. Group 1 was asked about themselves (their *own* motives, judgements); Group 2 was asked to indicate their thoughts about “typical tourists”; Group 3 indicated their thoughts about “average tourists” and Group 4 was asked about social desirability concerning various parameters. Results indicate that all hazards, including food risk, were judged to be low, but significantly higher for the typical tourist compared to “me”, particularly food risk. We interpret our results in terms of processes such as the “optimism bias” and “the illusion of control.

### **Background**

Lepp and Gibson<sup>1</sup> identified “*strange food*” as one of seven risks related to tourism, and Böcker & Hanff<sup>2</sup> highlighted the pervasiveness of the last couple of decades’ increasing numbers of food scares and food safety crises, making such hazards highly salient. The food and catering literature has had various foci of attention concerning food risks<sup>3</sup>. These include microbiological hazards and risks, such as food containing harmful bacteria genetically modified food, exposure to irradiated food, food containing residues of pesticides and food additives (*ibid*), and hygiene<sup>4,5,6</sup>.

Within tourism studies the risk issue has been approached from various angles, such as destination safety, risk creation and narratives and risk taking<sup>1,7,8,9,10,11,12,13</sup>. Linking tourism studies with issues of subjective food risk, Larsen et al.<sup>14</sup> reported that tourists perceived “home country” as being safer than “abroad” concerning *all* the food hazards, and no matter where the tourists

came from. They also reported that tourists judged the structure of food risks at home to be different from food risks abroad, for example that tourists judged “salmonella” to be the most risky abroad, and “genetically modified food” to be the most risky hazard at home, a structure that was also found in a sample of tourists to Spain<sup>15</sup>. Larsen et al.<sup>15</sup> reported that tourists judged their “current trip” less risky than both the general class of trips to which the “current trip” belonged, and other holiday forms. The evidence thus indicate that “*imminence to self*” is related to judgements of food risks in a systematic way

This study follows up this stream of research focusing on “risk to me” versus “risk to typical (average) tourists”. Based on the above cited references we expected that “risk to me” would be lower than risks to the “general other” (i.e. the typical or average tourist).

## **Methods and materials**

### ***Respondents and procedure***

Potential respondents were approached at various locations in Western Norway where tourists would want to visit (The fish market in Bergen, Tourist information offices, fjord boats). Some 1900 agreed to filling in questionnaire which addressed “various aspects of being a tourist”. All in all 1891 questionnaires were filled in satisfactorily.

The study was a field experiment. Respondents were randomly assigned to one of four experimental groups; Group 1 (n = 718) answered questions about their *own* preferences, motives, expenditures, risk judgments, attitudes and various other aspects of being a tourist. Group 2 (n = 403) and Group 3 (n = 380) were asked identical questions with reference either to “a typical tourist” (Group 2) or “an average tourist” (Group 3) concerning the relevant parameters. Group 4 (n = 390) answered the same questions with reference to “typical tourists from your home country”. In addition this group was asked to rate the “social desirability” of various motives and attitudes.

Group 1 had an overrepresentation of young respondents who stayed at a Hostelling International (HI) facility (HI gathered some data for us, but only using questionnaire no 1). Consequently respondents from a HI facility were removed from the analysis. After this removal there were no age differences between the experimental groups (t values ranging from .33 to 1.54, all p values ns), no differences in length of holiday (t values ranging from .10 to 1.14, all p values ns), and the gender distribution in the groups was similar ( $\chi^2$  (df 1,3) = 3,75, p = .29)

***The questionnaire***

The questionnaire was administered in English. It took some 5-10 minutes to fill it in. In addition to demographical background variables (gender, age, nationality), we included questions concerning expenditures, length of current trip, accommodations and risk judgments (self, typical and average). Altogether 8 hazards (see Table 1 & Figure 1) concerning risk was rated on a 7 point scale from “not risky” (1) to “very risky” (7). Food risk was measured using the item “*How risky do you consider the trip you are on now to be concerning*” ... “ ... *food poisoning*”. The alternative forms of this item for Group 2 and Group 3 was: “*On a trip like the one you are on now. How risky do you consider the following hazards to be for a typical (Group 2)/average (Group 3) tourist?*”

**Results**

There were no differences between the mean risk ratings for the groups who indicated risks for “typical” and “average tourists” (t values ranging from .18 to 1.29, all p values = ns), which implies that these two groups could be collapsed (joined) into one.

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**Table 1: Correlation between the hazards<sup>1,2</sup>**


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	<b>Terror</b>	<b>Food</b>	<b>Infections</b>	<b>Traffic</b>	<b>Violence</b>	<b>Accidents</b>	<b>Petty Crime</b>
<b>Food</b>	.605						
<b>Infections</b>	.669	.649					
<b>Traffic</b>	.337	.479	.422				
<b>Violence</b>	.610	.542	.643	.523			
<b>Accidents</b>	.353	.451	.479	.614	.636		
<b>Petty Crime</b>	.397	.466	.484	.469	.688	.611	
<b>All in all</b>	.371	.495	.453	.557	.587	.617	.596

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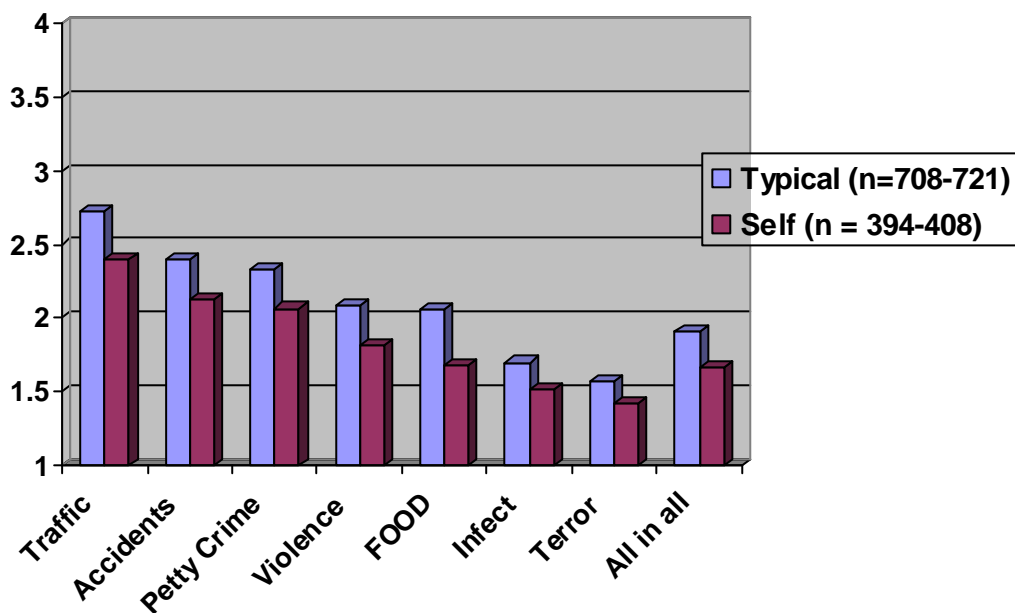
<sup>1</sup> Only respondents who answered with reference to “Self”, n = 688-711

<sup>2</sup> All p values significant at the .000 level

Table 1 shows a correlation matrix of the eight items concerning risk. Food risk is strongly related to other hazards; people who judge food risky also judge other hazards risky.

As can be seen from Figure 1, people tend to judge all hazards to be more risky for others (in casu “the typical tourist”) than for themselves. All risks are judged to be low, i.e. below the scale mean (4). The largest discrepancy between “me” and others is for the food item. People tend to judge the “All in all risk” to be lower than several of the individual risks.

**Figure 1: Risk judgements: “Typical tourists” and “Self” (Scale 1-7)**



(All differences significant (Terror;  $p = .047$ , all other  $p < .005$ ))

### Discussion and conclusions

As predicted, people judge risks higher for typical tourists than for themselves, particularly food risk. Our research also replicates the finding that the “all in all” risk is judged to be lower than some individual sources to this totality, although this is logically impossible.

But, our results indicate that people range risks to be low. The highest risks are proximal (traffic/accidents/petty crime), while more distal hazards (terror and

infectious diseases) are judged to be less risky, which is in line with earlier studies of tourists' worries<sup>16</sup>. This may be because most people have had no direct knowledge of terror attacks, while many may have heard of or experienced tourist accidents or tourists as victims of petty crime. This finding may thus be a result of the availability heuristic<sup>17,18</sup>. That people judge others to be more at risk than themselves, may be a result of the so called "optimism bias"<sup>19</sup> which is the general tendency to think that one is less likely to suffer harm than other people.

Accumulated<sup>14,15,16</sup>, our research has shown that people 1) judge home food to be safer than food abroad, 2) judge own trips to be safer than others', 3) judge proximal events to be more risky and worrisome, and 4) judge hazards to be less risky for themselves than for others. Future research should go into the various processes and determinants of such judgements, and maybe direct attention towards implications of such results for the industry.

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## **Heritage tourism and foods: Born in Pennsylvania**

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**Keywords:** heritage tourism, heritage foods, heirloom foods, Amish, Pennsylvania Dutch, saffron.

### **Abstract**

Heritage tourism and heirloom food items with provenance are a recent and worthy trend in America and elsewhere. They have become a cornerstone for the rapidly developing popularity of traditional foods in Heritage tourism. This paper examines a place that was way ahead of the curve. Long before these trends were identified Lancaster County, Pennsylvania was deeply involved with leveraging heritage culture and food ways as an attraction for tourists.

### **Background**

#### *What is old is new again*

The quest of the curious traveller to examine a culture, its heritage and food ways is an increasingly popular one. In the late nineteenth century Lippincott's Magazine was already writing about the community of Pennsylvania Germans in and around Lancaster Pennsylvania. So keen was the interest in the ways of these people that in 1898 William Beidelman published, *The Story of the Pennsylvania Germans*, tracing their Palatinate origins, an invitation to emigrate to Pennsylvania by William Penn, and further came to their defence saying that "All persons who have had transactions with our German farmers, love to respect the excellent sense they display for the ordinary concerns of life"<sup>1</sup>. This was, and is, the hallmark of this compelling community.

By the 1920's the Lancaster Chamber of Commerce and Industry was inviting new motor driven tourists to visit "America's Garden Spot." Even then, most people came to see the Pennsylvania Germans — the Amish, Mennonites, the folks who would eventually be collectively called the Pennsylvania Dutch. Little has changed in this living museum as David Walbert writes: "beyond it are more meadows, more farms and farmhouses, more Old Order Amish and Mennonite farmers and families, in patchwork stretching to the horizon. The view ... seems

not so different from the view here fifty or a hundred or two hundred years ago”<sup>2</sup>.

What draws the tourist to a place with Heritage on offer, with the promise of authenticity is the encounter with its culture and nothing is more intimately connected with that experience than a culture’s food ways.

Pride of place, heritage, heirloom, authentic, forgotten, traditional — call it what you will, certain foods have survived for centuries and for good reason. There is a renewed value today in provenance in both specific cuisines and single food items. Whilst the bestowing of provenance to a specific cuisine or a single food item - tomatoes, potatoes, Bison, hogs, turkeys, even a spice like saffron - has become a recent signifier of credibility as well as a successful marketing ploy, there is a group of people who having been exploiting its effectiveness for over 70 years.

### ***Emigration to the New World***

Through the port of Philadelphia the immigration of a large German speaking population began in 1683<sup>3</sup>. These were the immigrants who populated and settled in what was known then as, and still is, the Germantown section of Philadelphia. The mass immigration of the 18th century brought more agriculturally inclined, adventurous and pragmatic newcomers who drifted into the interior of Pennsylvania. There they developed the rich farmland area known today as Lancaster County. These Pennsylvania Germans were in many ways a homogenous group. They came to America from Germany, but also from Switzerland and eastern parts of France — wherever the German language was spoken before 1800 — the Palatinate. They came to Pennsylvania first; many stayed and others went north and west into their adopted homeland.

The significance of the Port of Philadelphia in the 18<sup>th</sup> century cannot be understated. Philadelphia (in the state of Pennsylvania), had been the capitol of the United States from 1790 until 1800<sup>4</sup> and was widely regarded as the “Athens of the America”<sup>5</sup>. It was there that the Declaration of Independence from King George III’s England was penned. It was there that congregated the great thinkers, inventors and scientists, cabinetmakers, artists, silversmiths, and politicians of the colonies.

Depending on a long list of cultural, behavioural and religious variants, the Pennsylvania Germans (known after the 1930’s as Pennsylvania Dutch) were, and are today, still known as: Brethren, Mennonite, Amish, and other Anabaptist “plain” people. So called, Gay Dutch, include: Catholics, Reformed, Lutheran, and other faiths. Fundamentally unchanged, the Pennsylvania Dutch constitutes a rich, complex, variable and endlessly intriguing culture.

Pennsylvania Dutch cuisine has had a profound and long-lived influence on the areas in which the Pennsylvania Dutch originally settled — Central and Southeastern Pennsylvania.

Although it has been said with authority that food in the American colonies strained to emulate the tastes and preferences of the colonizers' English forbearers; the Pennsylvania German food ways and the widespread and steady influence cannot be denied. "Yet above all else it is a cookery with a place of sense, a cuisine that recognizes the unchanging essence of *Bodegeschmack*" — the food has in it the taste of the land<sup>6</sup>.

Based on their German heritage, anchored to a largely agricultural lifestyle, frugal and intent on making the most of resources available, a cuisine evolved that reflects the intentionally simple nature and religious fervour of the people practicing it.

A Pennsylvania Dutch cook hates to waste anything, and will always make something tempting and delicious out of food others might discard such as pork scraps, organ meat or watermelon rind. A well known aspect of Pennsylvania Dutch cooking, especially amongst the Amish, is the fabled seven sweets and seven sours derived from the European belief that there should be balance in everything. In the mythology of Pennsylvania Dutch cooking there would be seven each of various pickled foods, relishes, and spreads, accompaniments to hearty, filling dishes as part of the supper. In the absence of refrigeration, much of it prepared in late summer and "put by", that is preserved in jars, for the winter months.

Shoo-fly pie, Scrapple, Schnitz und Knepp, Shales and Gumbis, chow- chow relish, Cope's corn, Moravian Sugar cake; all are well known as Amish and Mennonite favourites, both authentic and inauthentic. Of all the derivative, authentic foods with Pennsylvania German provenance, perhaps the most surprising single item is saffron. The cultivation of saffron in America is confined to southeastern Pennsylvania. We find it used in saffron noodles, in chicken pot pie (or *botboi* in Pennsylvfaanisch, a German dialect derived from Palatinate German) and saffron tea cakes. Not indigenous to Pennsylvania, saffron became very important in the late 18<sup>th</sup> century. Prior to cost benefit revelations, however, saffron would have been regarded by these simple folk as a luxury, a food for noblemen, perhaps even a little decadent.

That saffron and other tastes born on the continent or adapted and reborn amongst Pennsylvania Dutch are practiced today is due in part to a closed community with stubborn, albeit tasty, culinary traditions. Sustained over years, saffron might be thought of as a symbol of the region's unwavering rural hospitality<sup>7</sup>.

### ***Saffron in the New World***

In the U.S. there is but a single place where saffron is cultivated — in Lancaster, Pennsylvania. German immigrants have used saffron in cakes and breads for more than two centuries – it continues to be cultivated there today.

Native to Greece and Asia Minor and now grown in Spain, Turkey, Iran and China, saffron was once grown in Europe and, remarkably, England. In the 16th century, a patriotic English pilgrim returning from the Holy Lands hoping to bring wealth to his people, risked death by smuggling a saffron crocus bulb in his hollowed-out staff<sup>8</sup>. This single plant, or corm, led to a local industry that lasted 200 years and gave Saffron Walden in Essex its name<sup>9</sup>.

No matter in what gentle climate the deep lavender-coloured, fall-blooming crocus *Crocus Sativus* is grown, it must be harvested at dawn before the blooms begin to wilt<sup>10</sup>. Workers in Pennsylvania gather it into their aprons, as it has been done elsewhere for centuries, and from there gently cradle it in canvas-covered baskets. The flowers are carefully separated from its three brilliant orange stigmas — the source of the perennially valuable saffron. The spice is distinguished by its bright colour, aroma and slightly bitter flavour unlike any other.

It takes approximately 110,000 to 170,000 blossoms to make a single kilogram of saffron<sup>11</sup>. The impressive cost of labour-intensive saffron must be weighed against how little is employed in the kitchen. A tenth of a gram (40—50 filaments) can transform a mundane dish into one of exotic splendour.

For the restrained, yet business savvy, Pennsylvania Germans the recognition of a demand spurred agricultural incentive. Trade with the Spanish and Portuguese population in the Caribbean supplied the impetus for increased saffron cultivation during the latter part of the 18<sup>th</sup> century. There had been saffron dealers among the Pennsylvania Germans in the early 1730's. It wasn't, however, until Philadelphia merchants attempted to monopolize Caribbean trade, cutting out England and Spain (potential suppliers of Saffron), that cultivation of the crocus intensified<sup>12</sup>. At the time the spice was traded on the Philadelphia Commodity exchange at par with gold — one pound of saffron equal to one pound of gold<sup>13</sup>.

### **The commodification of a lifestyle**

As saffron can be seen as metaphor for traditional Pennsylvania German food ways, so did their enduring food ways become a window on their lifestyle.

The evolving popularity of Lancaster County, Pennsylvania as a heritage destination lay in the fact that a conscious effort was made to leverage a unique lifestyle, particularly their food ways, into a tourism bonanza. Post cards and

advertisements during the 1930's and '40's iconized and commoditized the Amish and the Plain Dutch life and foods into must see and must taste curiosities. Place names like Bird-in-hand, Intercourse and Paradise, Pennsylvania further inspired the curious.

The first Lancaster County Motel, The Willows, was built in the 1940's. By this time the Amish and their rural customs and foods were inseparable from the perception of Lancaster County. Lancaster's landmark, Hotel Brunswick, offered stay-over packages with bus tours of Amish and Mennonite sites and offered "Yonnie's Pennsylvania Dutch Dishes" on their restaurant menu. Get a taste of the Pennsylvania Dutch lifestyle, "its wonderful good"<sup>14</sup>. The only way to taste that lifestyle was through the food and everyone was more than ready to do so. The food, authentic or modified to visitor's tastes, was, however, the closest the tourist could come to experiencing how the Amish and Mennonites truly lived.

By the time the Eisenhower Administration (1953-61) had undertaken the expansion of the American highway system, the ground-work had been well established. The Pennsylvania Dutch were in the unique position to permanently establish their distinct culture, communities and cuisine into a popular destination.

So widespread had the heritage aspect of the people of Lancaster county become that a Broadway musical production called *Plain and Fancy* opened in 1955, based on Pennsylvania Dutch life that included the, by then well known, barn raising and an old-fashioned wedding. The year prior to *Plain and Fancy*, Lancaster County welcomed approximately 25,000 visitors; after the Broadway hit — one million<sup>15</sup>.

While progressive statistics are difficult to locate, it is an undeniable fact that Lancaster County represents a significant contribution to the tourism dollar in Pennsylvania. According to Louise Stoltzfus, Lancaster County resident and author: "approximately 4 million people visit Lancaster County each year, 1.2 billion tourist dollars are spent each year; visitors come to see the Amish ... and cultural attractions"<sup>16</sup>. In 1997 83.4 million travellers visited Pennsylvania. One in four participated in Heritage Tourism or 21.9 million visitors<sup>17</sup>. The most visited Heritage Region was the Lancaster/Heritage region which boasted a 69% visitation percentage<sup>19</sup>.

In 1985, Peter Weir's, Academy Award winning suspense film, *Witness*, brought renewed international interest to Lancaster County and the ever fascinating Amish.

It is a testimony to the nature of the people, to the Pennsylvania Germans, to the steadfast that live the simple life, that today people still come to see the "Amish" and to eat the hearty home style cooking that began the tourism industry in

Lancaster County. “That's what's really fun ... to poke around at the stands, stop and talk to local people, to see Amish girls in traditional dress driving wagons”<sup>19</sup>. What began as heritage tourism long before the term was coined, succeeds today on the same premise in spite of many changes to the country side and ethos of Lancaster County. “... The notion that a single place called Lancaster County and the residents’ identification with that place ...persists into the twenty-first century ... somehow unifies the residents. For them, the county’s ruralness is a source of identity; for outsiders, it is a source of fascination”<sup>20</sup>. The persistence of the idea of heritage and the persistence of traditional foods, food with provenance, be they a tomato, a hog or a spice out of place and time, is remarkable in our era of consistently embracing the new.

## Conclusions

In Lancaster County it is not far, to use the now popular phrase ... from farm to table. Never was. That costly saffron appears in the properly prepared *bott-boi* or saffron noodles, stewed chicken or Tea cakes, whether or not shoo-fly pie is real Dutch or has anything to do with flies, or if you prefer smoked tongue in your sugar kraut — seeking out the true foods, those with provenance has become paramount. All cultures are connected to food first and foremost. The new interest in heritage travel destinations and the foods that exemplify them is encouraging, vital and worthy of support.

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### **Addendum**

#### **Saffron Egg Pasta & Yellow Tomato Sauce –Safferich Nudelmit Geeltomatts-Sosse**

Adapted from *Pennsylvania Dutch Cooking*, William Woys Weaver, 1993, Abbeville Press

Servings: 4-6

1 Tbs + 1 tsp unsalted butter, cold

1 1/2 cups flour

1/8 tsp salt

2 large eggs

2 large egg yolks

1/4 tsp Lancaster saffron threads ground to a powder

Cut the butter into the flour to form fine crumbs. Beat the eggs and egg yolks together until lemon colored.

Make a well in the center of the crumb mixture and pour in the eggs. Work together until a dough forms. Roll out the dough as thin as possible - or run it through the pasta machine in decreasingly finer rollers.

Drape over back of chair to dry. After 20 minutes cut into strips for noodles.

### **Yellow Tomato Sauce**

1 cup yellow tomatoes, blanched, peeled, puréed

1 cup chicken stock

2 fresh bay leaves

20 pearl onions, halved

1/2 cup carrot, diced

1/4 cup dried peaches

2 tbs safflower oil

1 cup yellow tomatoes, chopped

1 tsp minced tarragon

1 tbs garlic vinegar

Combine the puréed tomatoes, chicken stock and bay leaves and bring to a gentle boil. Cook ten minutes; remove from heat.

Bring a cup of water to a boil and simmer the onions, carrot, peaches for 5 minutes. Drain and keep ready. Cook in plenty of well salted boiling water for 3-4 minutes (until *al dente*, an old PA Dutch term). Drain and return to sauce pot. Add reserved puree and the onions, carrots, peaches plus the chopped raw tomatoes and gently toss until well heated. Add tarragon and garlic vinegar at the last minute and serve in warm bowls

### **Stewed Chicken with Saffron and Chervil**

Adapted from: William Woys Weaver, December 1997, from issue #12

Servings: 6

3-1/2 to 4 lb. stewing chicken

3 Tbs. garlic-flavored oil

1 cup chopped onions

1 cup chopped leeks



1 cup carrot shredded on the large holes of a vegetable grater  
1/8 tsp. saffron, ground to powder in a mortar  
Salt and freshly ground pepper  
1/2 cup minced chervil

Cut the chicken into quarters, then trim off the wings and drumsticks.

Heat the oil in a large sauté pan or skillet and brown the chicken parts, including wings and drum-sticks, with the chopped onion for 20 min. over medium heat.

Add 3 cups water, the leeks, carrots, saffron, and salt and pepper to taste. Cover and stew over low heat for 40 min. or until the meat is tender.

Add the chervil and serve immediately with boiled potatoes or potato dumplings.

Note: This dish can be made and reheated in a microwave oven.

### **Saffron-Flavored Spelt Salad with Corn**

Adapted from: William Woys Weaver, December 1997, from issue #12

Servings: 6

2 cups spelt groats (whole berries)  
3 cups water  
2-1/2 tsp. salt  
1/2 tsp. saffron ground to a powder in a mortar  
4 cups fresh yellow corn kernels (or frozen corn, see note)  
1 cup chopped scallion  
3 Tbs. finely chopped shallot  
1 cup chopped red bell pepper  
2 tsp. ground cumin  
6 Tbs. garlic-flavored vinegar  
2/3 cup salad oil, preferably sunflower  
1/4 tsp. freshly grated pepper  
2 tsp. minced parsley or lovage

Rinse the spelt and let it drain in a sieve or colander. Put the water and 1/2 tsp. of the salt in a saucepan and bring to a boil. Add the spelt and saffron and boil 20 min. uncovered. Do not stir. Cover and simmer 40 min. or until the spelt is plump and tender. Then add the corn and cook uncovered until the corn is hot and all the liquid in the pan has evaporated. Set aside to cool.

To assemble the salad, put the corn and spelt mixture in a deep bowl. Add the scallion, shallot, bell pepper, and cumin. Stir to distribute the ingredients evenly. Make a well in the center of the mixture. Put the remaining 2 tsp. of salt and the vinegar in a small bowl and whisk until the salt is dissolved. Add the oil and pepper whisk lightly until combined, and pour into the well. Stir up from the bottom and serve immediately with a garnish of parsley or lovage. This salad will keep in the refrigerator 3 to 5 days.

Note: Frozen corn may be used thawed, but should not be cooked. Simply uncover the spelt at the end of the cooking period and cook out the excess liquid. Add the thawed corn, stir, and reserve as directed.

### **Saffron Tea Cake**

Adapted from: William Woys Weaver, December 1997, from issue #12

Servings: 25 - 2" x 2" squares

1 tsp. dry breadcrumbs

1/2 tsp. anise seed

4 Tbs. unsalted butter at room temperature

1 cup honey

1/2 cup sour cream

4 eggs, yolks and whites separated

2 cups sifted pastry flour

1/2 tsp. saffron, ground to powder in a mortar

1/2 tsp. baking soda

1 Tbs. cream of tartar

2 to 3 tsp. poppy seeds

Preheat the oven to 350°F. Grease a 2 in. x 10 in. x 10 in. cake pan and scatter the breadcrumbs over this. Shake the pan gently so the crumbs adhere evenly to the bottom and sides. Pour off any excess crumbs. Scatter the anise evenly over

the bottom and set aside.

Cream the butter and honey until smooth, and then add the sour cream. Beat well.

Whisk the egg yolks until frothy, and combine with the honey mixture.

In a separate bowl, sift together the flour, saffron, soda, and cream of tartar three times to ensure even distribution of the leavening. Then sift this into the batter, folding gently to avoid over-activating the soda.

Beat the egg whites until stiff peaks form, and then fold them into the batter.

Pour the batter into the prepared cake pan and spread it evenly with a paddle or spatula. Scatter the poppy seeds over the top and bake for 30 min. or until done in the center. Cool on a rack.

## Subjective food risks in tourists travelling in China

Larsen S.<sup>1,3</sup>, Ning Z.<sup>2</sup>, Wang J.<sup>2</sup> Øgaard T.<sup>3</sup>, Li X.<sup>2</sup> and Brun W.<sup>1</sup>

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**Keywords:** food risk, tourists, China

### Abstract

The present study follows up findings from studies of tourists in the West<sup>1,2</sup> which have shown that tourists perceive food risks to be higher *abroad* than *at home*. New data from a sample of international and domestic tourists in China was used to investigate the expectation that food risk “abroad” would be judged to be highest and food risk “at home” to be lowest. In addition we investigated whether there are differences in levels of subjective risk connected to food related hazards.

Of a total of 1234 respondents, 804 were domestic Chinese tourists. Risk “at home” was judged to be lowest, before “this trip” and “abroad”. Since absolute levels of food risks were significantly higher in this sample as compared to samples from the west, a separate analysis comparing Chinese and non-Chinese tourists was performed for all hazards in all the three scenarios. Almost without exception, Chinese respondents scored higher on risk judgements.

These cross national differences are difficult to explain, but maybe there are cross national differences in expectations, in scale use or in the “cultural setting” which influence such judgements, or maybe Chinese tourists are more risk apprehensive?

### Introduction

Larsen, Brun, Øgaard and Selstad (2007)<sup>1</sup> reported that tourists (n = 1884) perceived “home country” to be safer than they perceived “abroad” to be concerning food risks. Their results also indicated that tourists judged “salmonella” to be the most risky food hazard abroad, and “genetically modified food” the most risky food hazard at home. They further found that domestic tourists (in casu Nordic tourists) were among the least risk adverse, a finding that might be due to the fact that their data was collected in a Nordic country. In

a later study<sup>2</sup> from Mallorca, Spain, these findings were replicated. Also in that sample Nordic tourists were least risk apprehensive.

The present study follows up these earlier studies in a sample of tourists to Beijing, PRC. It was expected that food risk “at home” would be lowest. Concerning cross national differences it was expected that *domestic* tourists<sup>2,3</sup> (in this case Chinese) would be the *least* risk apprehensive, and that there would be no differences in risk judgements concerning “the current trip” (i.e. the trip you are on now).

## Methods and materials

### *Respondents and procedure*

Over a two week period in August 2008, some 1300 individual tourists visiting Beijing were contacted in the area around the Olympic Park. Respondents were asked if they were on vacation, and if so, if they were willing to fill in a questionnaire “on various aspects of being a tourist”. Very few refused to participate in the survey, and we received 1234 returned questionnaires. There were some 804 domestic Chinese tourists in this sample; the other 430 respondents represented 64 countries. Some respondents did however not fill in all items. In the total sample 50.5% were women, mean age was 34.7 years (range 12-76). There were no gender distribution differences between the domestic and international respondents ( $\chi^2 = .33$ , ns), but an age difference was found; Chinese tourists were significantly older (Mean age (Chinese tourists) = 36.3, Mean age (non-Chinese tourists) = 31.9,  $F(1,1231) = 41.00$ ,  $p = .000$ ). No correlation between *total* food risk judgements and age was observed (although for *CJS* and *Scrapie*, very low positive correlations with age were observed for all three (“at home”, “this trip” and “abroad”) conditions; Pearson’s  $r$  in the range .06 - .09).

### *Questionnaire*

The questionnaire was administered in various languages including English, Mandarin, Mongolian, Thai and Vietnamese. In addition to demographical background information (gender, age, nationality), respondents answered questions concerning travel risk<sup>3</sup>, tourist related worry<sup>4</sup>, and subjective food risks<sup>3</sup>. Subjective food risk was evaluated concerning five risk factors: Genetically modified food, Salmonella, Chicken flu, Mad Cow Disease (CJD) and Scrapie<sup>2</sup>, on a seven point scale ranging from not very risky (1) to very risky (7). All food risks were rated concerning “at home”, “abroad” and “current holiday”. Correlations, t-tests for independent samples and ANOVAs were used for the statistical analyses.

## Results

Figure 1 shows how the food hazards are judged risky by tourists in China. As can be seen, abroad risks are significantly higher than “this trip” and “at home” risks. All food risks are judged to be high, considerably higher than in other studies done in the west. But we have reported earlier<sup>1</sup> that respondents from the Far East obtained higher risk scores than westerners. Since this sample was predominantly Chinese, it was therefore decided to perform a comparative analysis of Chinese and non-Chinese respondents.

**Figure 1. Subjective judgements of food risk in tourists in China (n = 1229-1234)**

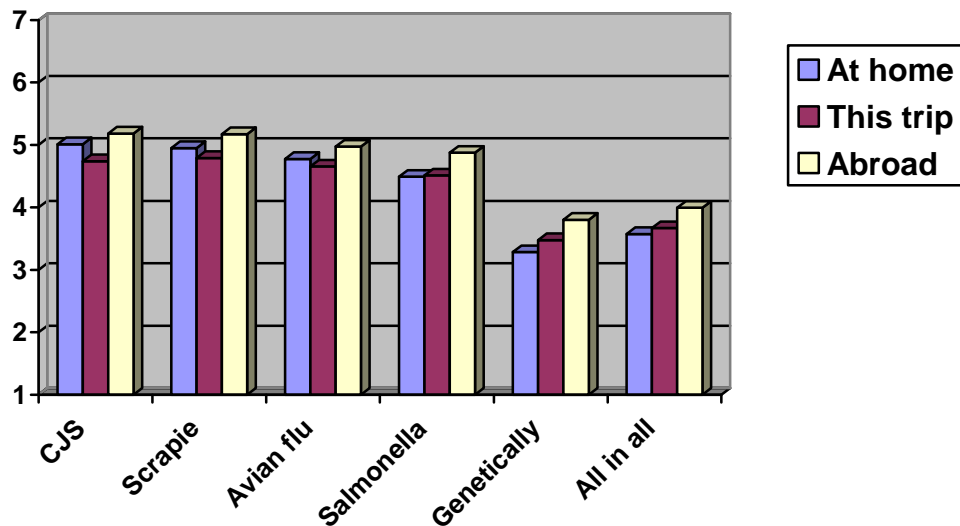
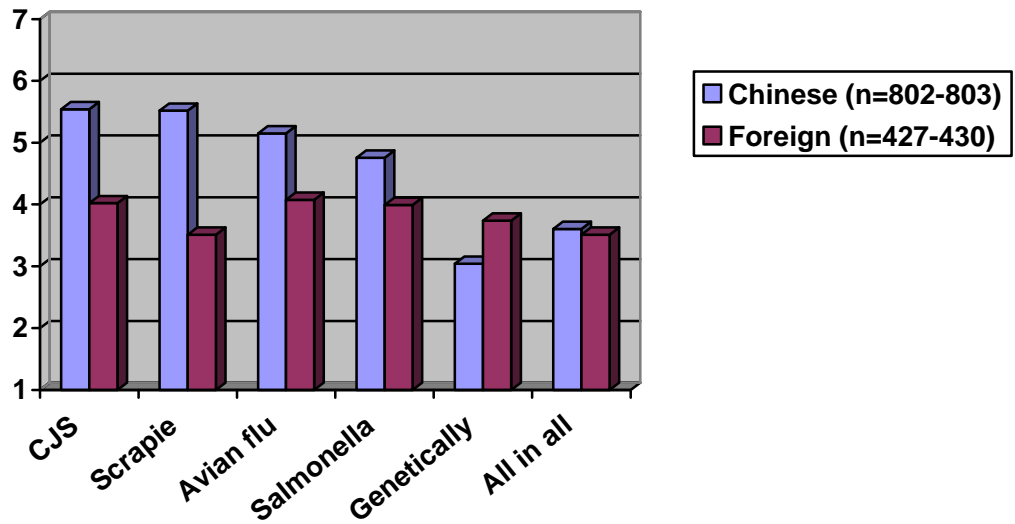


Figure 2 shows the “home risk” structure of Chinese and non-Chinese respondents respectively. Chinese respondents judge *all* food risks at home higher than non-Chinese respondents do, except “genetically modified food” where they rate risk to be significantly lower than the other tourists, and the “all in all” risk, which is judged equally high in both groups.

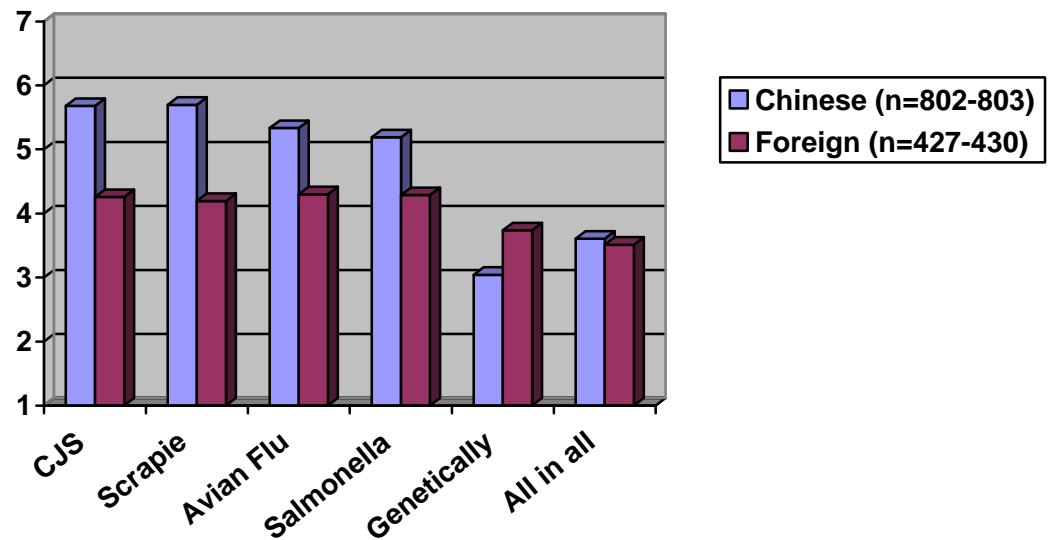
Figure 3 shows a similar pattern concerning food risk abroad: Chinese respondents are the most risk apprehensive (again except from the item “genetically modified food”, and except for the “all in all risk”). Looking at risk judgements concerning the *current trip* (Figure 4), exactly the same pattern emerges. Chinese respondents are more risk apprehensive on their current trip than international tourists to Beijing.

**Figure 2. Food risk at home: Chinese and non-Chinese respondents in Beijing**



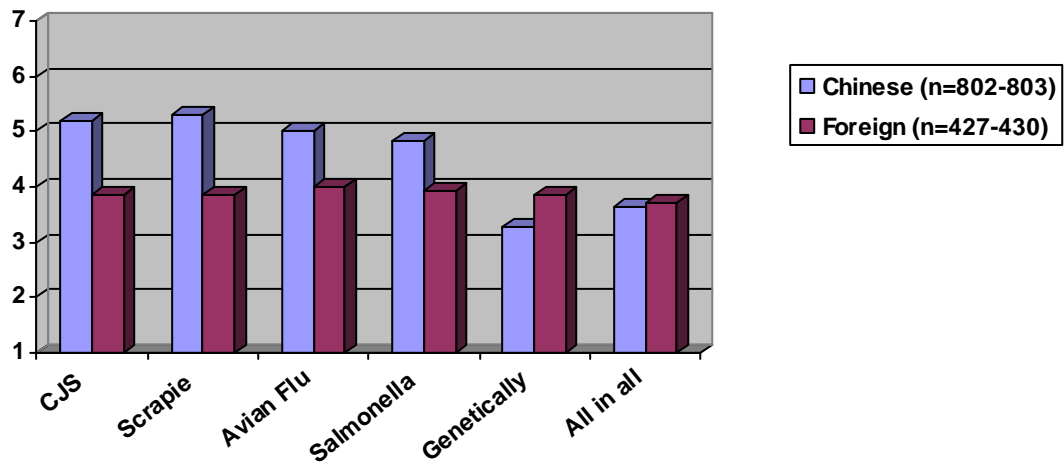
(All differences significant at  $p < .000$ , except “all in all”;  $t = .82$ ,  $p = .41$ )

**Figure 3. Food risk abroad: Chinese and non-Chinese respondents in Beijing**



(differences significant at  $p < .000$ , except “genetically modified food” ( $t = -2.07$ ,  $p = .03$ ) and “all in all”;  $t = .97$ ,  $p = .33$  (ns))

**Figure 4: Food risk this trip: Chinese and non-Chinese respondents in Beijing**



(All differences significant at  $p < .000$ , except “All in all” ( $t = -.45$ ,  $p = .64$  (ns)))

Table 1. Mean “Home”, “Abroad” and “Current trip” food risks in domestic and international tourists to China

	Domestic	International	F	p
Home	4.61	3.86	73.75	.00
Abroad	4.94	4.15	84.86	.00
Current trip	4.54	3.86	55.07	.00
$\Delta$ Home- Abroad	.34	.29	.88	.35
$\Delta$ Home- Current	-.06	.00	.87	.35

Following convenience<sup>1</sup>, a total mean (n items/6) score for all hazards was computed. As can be seen from Table 1, total risks are higher for domestic than for international tourists. But interestingly, the *changes* in risk judgements from home to abroad and from home to current trip are exactly the same for both domestic and international tourists.



## Discussion

In line with our earlier findings<sup>1,2,3,4</sup>, tourists think their home food is safer than food abroad and judge the “current trip” to be safer than (general) trips abroad; even international tourists in Beijing do so. Chinese tourists judge all hazards except genetically modified food to be riskier than foreign tourists do, and both groups are similar in their “all in all” judgment of risk in all three conditions. The relative risk of travelling abroad is equally high in Chinese as in foreign tourists to China.

Chinese tourists were found to be more risk apprehensive. There may be many reasons for this; Chinese respondents may use the scale differently<sup>5</sup> or connotations concerning the expression “risk”<sup>5</sup> may be different. But earlier findings<sup>1</sup> have shown similar patterns; Asian respondents tend to be more risk apprehensive. And both groups judge “all in all” risk similarly high. In addition, both groups expose the “conjunction fallacy”<sup>6</sup>: the tendency to judge total risk less risky than the items contributing to this totality. A special case of risk can logically not be more risky than all risks combined. So, maybe Chinese tourists are more risk apprehensive than other tourists? But it is important to underline that both groups judge relative risk of travelling abroad to be equally high. This finding is important, since it probably indicates a human tendency similar for all people – this tendency is simply that it is safer at home than abroad.

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## **‘It has to vary’: Tourists’ multi-faceted relations to food**

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**Keywords: food tourism, gastronomy tourism, reason to go**

### **Abstract**

A series of classifications of tourists and their relations to food exist. Although highly tentative in nature, the qualitative interviews upon which this paper draws indicate that tourists’ relations to food are more complex than extant classifications suggest as some tourists, deliberately, relate to food in multiple ways during the holidays, or, as one of the interviewees argues: ‘It has to vary’. The paper discusses these complexities and points to implications for future research.

### **Introduction**

Kim et al.<sup>1</sup> claim that “food is one of the most important elements in tourists’ destination choice and travelers’ decision-making” (p. 59). Such beliefs permeate a series of influential texts on food tourism<sup>2,3,4,5</sup>. For example, Kivela and Crotts<sup>6</sup> argue that a destination’s food offer is a significant ‘pull factor’ and Lacy and Douglass<sup>7</sup> claim that “every tourist is a voyeuring gourmand” (p. 8). However, food is not only something that tourists search for and/or enjoy during the holidays as tourists cannot avoid eating and thus, food also acts as a basic necessity. Following this line of reasoning, Cohen<sup>8</sup> argues that although we travel in order to experience that which is novel and different, tourists also need ‘something familiar’ and he proposes a classification of tourists on the basis of their need for strangeness versus familiarity. In the same vein, Cohen and Avieli<sup>9</sup> argue that “people could be classified in terms of the relative predominance of their neophobic as against neophylic tendencies in food” (p. 759). Furthermore, Quan and Wang<sup>10</sup> distinguish between food as a supporting consumer experience and a peak experience during the holidays and suggest that the former relates to food as a basic necessity or to food as a ‘psychological island of home’ whereas the later refers to novel food experiences. Drawing on the work of Plog<sup>11</sup>, Hjalager<sup>12</sup> suggests that allocentric tourists explore local food habits whereas psychocentric tourists want to eat the same food as they do at home. Hjalager furthermore constructs a ‘sociology of gastronomy and tourism’ on the basis of Bourdieu’s<sup>13</sup> four lifestyles. A common denominator

across these categorizations is that tourists are classified as either being attracted to novel food or as individuals who prefer familiar food, thus suggesting that tourists' relations to food are rather stable and static. Hjalager, though, (p. 3) reminds us that "little is known about how [...] tourists react to the portfolio of eating opportunities while on holiday". Accordingly, we do not know whether extant classifications adequately describe tourists' food related behavior during the holidays and we do not know whether today's tourists actually form rather stable and static relations to food during the holidays. In order to contribute to a prosperous future for the study of food tourism, the purpose of this paper is to discuss the roles food plays for tourists and particularly to suggest whether these roles align with extant theory. Drawing on a series of in-depth interviews (lasting one to three hours) this paper thus discusses the role(s) food plays – both within the single holiday and across the various holidays that people take.

## **Methods**

Cohen and Avieli argue that "there are hardly any detailed studies of the actual eating practices of tourists" (p. 756). However, if we wish to understand linkages between food and tourism, detailed studies that transcend 'either or' classifications are necessary. In order to better understand tourists' actual eating practices and reactions to the portfolio of eating opportunities at the destination, this paper accounts for the preliminary analysis of a series of in-depth interviews pertaining to this topic.

## **Results**

Although this paper draws on exploratory, and on-going, research, two types of touristic food behavior that seem particularly interesting are identified at present. The first group of tourists is not 'voyeurism gourmands'. On the contrary, these interviewees enact grocery shopping, food preparation and domestic dinner as everyday life chores and responsibilities that they want to escape during the holidays (see appendix A for further information). As a consequence, going out to eat is something these interviewees do, and enjoy immensely, during the holidays, but they are not particularly interested in food per se. Accordingly, to these tourists food is a supporting consumer experience during the holidays; albeit the ability to escape everyday cooking and henceforth, to eat out seems to qualify as a peak experience. It makes little sense to apply extant classifications to these tourists and to, for example, categorize them as 'neophobic' or 'psychocentric' as the novel and different food experience these tourists seek is to be revealed from at home food related responsibilities. Accordingly, although these tourists do not per se qualify as

‘food tourists’, to dine/eat out is a peak experience to such an extent that they may be labeled ‘restaurant tourists’.

The second type of tourists takes an interest in food and food qualifies as a peak experience. However, to classify these tourists as ‘voyeurizing gourmands’ that are pulled to the destination by its food offerings; as people who wish for only novel and different food experiences; or as neophylic or allocentric tourists would be a simplification at best. For example, Beth (27 years old; double income, no kids) and Alysia (25 years old, single) account for, and exemplify, their touristic food behavior as follows:

*“Well, we do try the local food. [...] I want to try something new and taste the local ingredients when we go out for dinner. At lunch, it’s usually something easy and quick – if we have lunch at all. But for dinner, we typically don’t eat at the same restaurant twice because we like to try something new. We try out different places. We were in Thailand during the Christmas holidays and off course we tried the genuine, local places but we also went to the ‘fine dining’ places’ [...] We do that when we’re on holiday – we do different kinds of things”*

*“Because we’re on holiday, we don’t cook – that’s way too hard. So it’s just going out to eat and eat exactly what you want to. Last summer I was in Spain with [a friend] and we had all sorts of food – tapas, fish, gazpacho. But we also had sandwiches and burgers – it was a mix of everything – everything we fancied”*

Both Beth and Alysia try the local food when on holiday (e.g. Beth’s ‘genuine local restaurants’ and Alysia’s tapas and gazpacho in Spain), thus exhibiting neophylic and allocentric traits. However, they also have sandwiches, hamburgers and other food stuff that align better with the food choices of the psychocentric and/or neophobic tourist. The fact that tourists like Beth and Alysia ‘do different kinds of things’ and eat ‘a mix of everything’ makes their touristic food behavior fundamentally different from what extant classifications suggest, thus questioning the basic assumption underlying such classifications (i.e. that tourists relate to food in a stable and static manner). 40 years old Ben (double income, no kids) argues why he relates to food in more ways during the holidays as follows:

*“It has to vary. I mean, if you have gourmet food every night for 2 weeks, then it isn’t ‘gourmet’ anymore, then it becomes as boring as everything else. It has to vary. I believe – and make an effort out of it during the holidays - that we ‘eat boring’ some days. A boring sandwich one night, that isn’t anything special and is rather cheap [...] Now and then, you have to eat boring, otherwise the other stuff doesn’t taste exiting. It has to vary, it always has to vary”*

Ben does not exclusively 'travel for food', but food is a peak experience as he uses food as access to local culture and at the surface, Ben might seem to be an allocentric and neophylic food tourist. However, as discussed in the next section, Ben's touristic food behavior contradicts, and henceforth questions, extant theory.

### **Discussion and conclusion**

As exemplified by Ben, some tourists do not align well with extant typologies and categorizations as relations to food vary; not just across holidays but also, and perhaps particularly, within the context of a single holiday. For example, sometimes Ben, deliberately, chooses a 'boring' sandwich and at other occasions, he prefers either 'gourmet food' or local food. Ben's relations to food are thus neither stable, nor static during the holidays. On the contrary, Ben, deliberately, relates to food in different ways during the holidays in order to maximize the pleasure that food gives him. The fact that tourists such as Ben deliberately seek variety is largely ignored by extant 'either or' classifications. Accordingly, to 'box' tourists makes us ignore the variety seeking behavior that (at least some) tourists apply in order for food to be 'non-boring' or even act as peak experiences. Although this paper draws upon some very preliminary results, it does raise the question of whether it makes sense to try to classify tourists on the basis of their relations to food. Furthermore, the study indicates that if we wish to understand tourists' relations to food, we desperately need detailed studies of tourists' actual eating practices as such practices seem far more complex, unstable and multi-faceted than extant theory suggests.

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**Appendix A: Sample profile**

Name	Background information	The role and importance of food during the holidays
Ann	42 years old housewife. Ann has adult children from a previous relationship. Presently living with her husband Keith and her 9 years old daughter Bitten.	They rarely go on vacation. But if they do go on vacation, they eat at (mostly family) restaurants. When on holiday, she wants to feel she has a holiday and to her, that feeling is highly intertwined with her getting away from cooking
Ben	40 years old. Double income, no kids (DINK), travels around 3 times a year	To Ben, food is extremely important during the holidays. But it covers a lot of different things: A sandwich, MacDonald’s, fine dining, food markets and supermarkets and ‘local restaurants’. Apart from a few gastronomic extended weekends, no up-front information search on food
Alysia	Single, 25 years old student. Travels both with her close	To Alysia, to be on holiday means to eat out. But food should not be too

	family (parents and siblings) and with friends.	expensive and it is not a peak experience per se. However, holidays means suspension of everyday life health concerns
Beth	27 years old. DINK. Travels at least three times a year. Sometimes only with her boyfriend, at other times also with friends and/or relatives	To Beth, food is a very important part of the holidays – it's where one has a cozy time and relaxes. Beth's portfolio of food related touristic behavior includes a wide variety of food and restaurants, e.g. local food and restaurants, French fries and burgers and fine dining
Cathy	44 years old single, who lives alone with her dog in a village	Cathy doesn't go away on holiday much. She usually spends her holidays at home with her dog but when she goes on holiday it is important to her not to cook
Ellen	27 years old. Nuclear family comprised of her, her boyfriend and their two kids (twins, who are 2 years old). Travels less after she became a parent	To Ellen, there is a major difference between holidays without children and with the children. When holidaying with the children, food is not that important and eating is 'on the children's terms'. When holidaying without the children (mostly shortbreaks with her husband), dining out is important
Lauga	29 years old student, single. Has travelled more in the past than she does at the moment	Lauga finds that local food is an expression of local culture and therefore it is really important for her to have local food during the holidays. However, she may also visit MacDonald's during the holiday
Fanny	37 years old caretaker. Nuclear family comprised of her, her husband (46) and their two children (11 years old son and 16 years old daughter)	To go on holiday equals to dine out. Dining out is mainly at restaurants that fanny defines as 'not too tacky, not too posh' – although this covers both local restaurants with unfamiliar food and family restaurants serving familiar food
Brittany	27 years old career-oriented DINK, who's been living	Brittany is very interested in food and may easily spend 2 or 3 hours on a



	with her boyfriend for the last 8 years. They go on holidays a couple of times every year; sometimes as a couple, sometimes together with friends and/or relatives	weekday cooking dinner. On holidays, Brittany wants to try local food but often ends up having a steak (which she really, really likes). Furthermore, when dining out, hygiene matters a lot to Brittany
Ginny	27 years old DINK with a master degree and one year into her first full time job. She has been with her boyfriend for two years. Before that, she has lived with another boyfriend but she has also lived as a single for some years in between these two relationships	When on holidays, Ginny wants to try the local food and the local restaurants. But she also eats other stuff during the holidays - including fast food
Gilbert	26 years old career-oriented DINK, who has lived with his girlfriend for a couple of years. Before that, he lived at his parents' house. He travels a lot with work and has, in recent years, also started to travel for leisure purposes	In relation to business travelling, Gilbert usually dines at 'fine' restaurants (with colleagues and/or business clients). He finds that he has 'enough of fine dining' on the business trips and as a result, when travelling for leisure purposes he prefers things that are more simple
Irene	24 years old student. DINK. Her husband is a self-employed chef in his thirties. They've been living together for the last four years	Food is really important during the holidays although there is a major difference between the kind of food she has on trips with girlfriends (not too expensive) and trips she takes with her husband (who has a professional interest in food). Although they do not travel for food, lately she and her boyfriend took a spontaneous trip and they were really disappointed that the restaurants only offered French fries and stuff like that
Holly	36 years old career-oriented DINK. Living with her 41	Food is really important during the holidays. Holly's portfolio of touristic

	years old boyfriend for the last 8 years. Before she met her husband, she did lots of backpacking and other low budget forms of travelling around the globe.	food behavior includes both restaurants, eating take away in the hotel room or at a nice spot and the buying of food stuff in supermarket that is later consumed at the hotel room balcony etc.
Henry	62 years old retired, empty nester (adult children). His wife is a bit younger and is still working. They have always travelled a lot and usually three times a year (e.g. in Northern Europe, Eastern Europe, Southern Europe (many holidays in Spain, Italy, Portugal) and in Thailand, Singapore, Mexico etc.)	Apart from the fact that they travel a lot, Henry is definitively the interviewee that comes closest to being a 'food tourist'. However, he himself defines food as 40% of the reason to travel – climate and getting new experiences count for the remaining 60 percent. Nonetheless, Henry spends lots of time before the holidays searching for information on food and restaurants in the area he is to visit (including blogging and chatting with other tourists, who take an interest in food)
Jane	50 years old empty nester (with two daughters in their mid twenties). Her husband is 60. Travelling has mainly been with the daughters. They travel almost every year, usual packaged holidays	To Jane, food is really, really not important during the holidays. But her husband enjoys a nice steak and they do eat out every day during the holidays because to her, being on holiday means no cooking
Sara	27 years old. Nuclear family comprised of her, her boyfriend (30) and their 5 years old son. She has always travelled and comes from a family, to whom food is really important. For example, her parents sometimes choose to go on a holiday/short break in order to visit a particular Michelin restaurant and she finds that her parents' interest in food has affected	To Sara, the importance of food during the holidays depends on the context. For example, when travelling with her extended family she typically has local food or might visit Michelin restaurants etc. When with her family in law she tries to split up so that they can get their wienerschnitzel and Danish salami while she can go to local restaurant and buy salami and cheese at local food markets

	her travelling a lot	
Fred	34 years old single enrolled in a joint degree master program and therefore, he has had various places of residence during the last couple of years. He predominantly travels with groups of friends	The role of food during the holidays depends heavily on context, companion travelers and the type of holiday. For example, he mentions the profound differences in food involvement relating to his hiking holidays and his sand & sea holidays. Fred argues that food ‘has to vary’ during the holidays and that one will – for example - crave for burgers after eating local food and will tire of burgers in a day or two

NB: Names of interviewees have been changed according to their wishes and in respect of anonymity issues

# Promoting culinary tourism in the Harz region of Germany

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**Keywords:** culinary tourism, Harz Mountains, Germany

## Abstract

The Harz Mountains are the highest mountain range north of the River Main that rises above the North German Plain, at the borders of Saxony-Anhalt, Lower Saxony and Thuringia in central Germany<sup>1</sup>. The Harz Region is a combination of wide plateaus, a central highland region with rocky peaks, mountain lakes, high moorland, and deep valleys with mountain streams, waterfalls and rare animal and plant species<sup>2</sup>. The unique natural heritage is well preserved through a network of protected areas including the Harz Geopark, the Harz National Park and Biosphere Reserve. Many of the historic towns in the region contain well-maintained, half-timbered buildings that reflect the region's former cultural heritage. There are many castles, palaces and religious buildings from the days of the Ottonians and the Romanesque period. Five UNESCO World Heritage Sites located in the region include the towns of Goslar and Quedlinburg<sup>3</sup>. The Harz Tourist Federation calculates more than 5 million overnight stays and approximately 10 million visits to the park area and its adjacent towns annually<sup>4</sup>. In 2006, a guest survey found that more than 50% of visitors indicate that they are interested in traditional and local culinary experiences as part of their visit to the region<sup>5</sup>. The purpose of this article is: first to profile the typical Harz tourist to understand their interests in food/culinary experiences; second, to conduct an inventory of traditional Harz foods that are offered to tourists; and third to perform a content analysis of national and regional marketing websites to evaluate whether traditional foods are part of the present marketing strategy in the Harz region.

## Literature review

Food is recognized as an increasingly essential element of the tourist experience and has become an increasingly important subject of study by tourism scholars as travellers have become interested in food and wine as a form of serious leisure<sup>6</sup>. Food provides symbolic meanings into lifestyle and social identity, offering a greater understanding of a destination's culture, history and people<sup>7</sup>.

Economically, food is supporting regional development through the diversification of the local economic base with the introduction of new products and events<sup>8</sup>. For many destinations, adopting a regional food tourism strategy provides advantages in the form of: increased visitation and length of stay, increased local employment, improved image, enhanced community pride, enlivening of public space, added value to food products, and socio-cultural benefits<sup>9</sup>.

## **Methods**

The study first adopts a review of secondary literature to verify the profile of visitor's to the region and to inventory traditional food products. An advantage of using secondary data is retrospectivity, which provides researchers with an opportunity to go back in time to examine tourism phenomena<sup>10</sup>. In the case of this research, visitor statistics and results of a guest survey provides important demographic and psychographic data to build a profile of the typical Harz tourist. In conducting the inventory of traditional Harz food products, a review of the Internet proved to be the most useful source of information.

Primary data was collected by using content analysis to identify the role of traditional foods in regional marketing materials to gain an understanding of the importance of food as a potential means of strengthening regional identity. Content analysis involves identifying a group of materials to analyse – in this case a sample of 14 national and regional public tourism websites— to record particular features (i.e. evidence of traditional foods) about the materials being analysed<sup>11</sup>. This technique requires a sample that is representative yet small enough to enable a substantive analysis. Content analysis is a frequently used research technique in tourism to identify the projected image of destinations<sup>12</sup>. The content analysis of this research was conducted by the authors and is based on secondary data thus presenting the option of re-testing. However, it is acknowledged that websites are temporal in nature and web-based information is regularly updated. It is also recognized that websites are not the only source of information promoting destinations.

## **Results**

Results are organized into three sections: (1) profile of the typical Harz tourist; (2) inventory of traditional Harz food products; (3) content analysis of public national/regional marketing websites for the Harz Region. The profile of the typical Harz tourist is as follows (Table 1)<sup>13</sup>:

**Table 1. Typical Harz tourist**

<b>Demographics</b>	<b>Psychographics</b>
Age: 30.9%, 51-65 years 28.7%, 66 + years 24.6%, 36-50 years 15.8%, 14-35 years	Trip planning tools: 47% Internet, 44.3% Based on personal experiences, 26.8% Word of mouth
Origin: 95% domestic/5% international Largest markets: 20% Saxony-Anhalt, 12% Lower Saxony, 9% North Rhine-Westphalia, 8% Saxony, 7% Berlin	Main motivation: 35% relaxation, 23.1% educational experience, 10.6% recreation
Length of stay: 2.5 days 75% short or weekend trips	Activities: 80% take a walk/hike in nature 85% participate in culinary activities, 70% visit cultural sites/museums
Frequency: 57.4% second/third time visitors +	Organisation: 90.5% on their own/independent
Travel party: 58.6% with partner, 12% with family, 10% alone	Means of transport: 79% travel by car 12% train 5% bus
Daily expenditure: 53€	

In identifying the traditional Harz food products, web-based research provided information for building a database of year round/seasonal products (Table 2)<sup>14</sup> that was then verified by a group of twelve local tourism experts.

**Table 2. Selection of traditional Harz food products**

<b>Year Round Products</b>	<b>Seasonal Products</b>
Beer: Hasseröder Bier, Lüdde Bier, Wippraer Bier, Harzer Urbier Gose	Deer, Game, Venison: red deer, dam deer, roe wild, mouflon, wild boars
Schnapps, Wine, Whiskey, Vodka: Schierker Feuerstein, Harzer Schmiedefeuer, Harzgeist, Brocken Feuer, Kerstranke, Harzer Hochland Single Malt Whiskey, Harzer Wodka Black Els	Fish: Brook trout, rainbow trout, carp
Cheese: from Harzer Rotvieh -- HarzKUH Käse, from Harz –Ziege – various goat cheeses	Berries: blueberry, woodland strawberry, raspberry, blackberry, currant used to make fruit wines
Chocolate: Brockensplitter/-tröpfchen	Fruits: apples and pears, juices
Bakery Products: Pyramid cake, Brockenstollen, Harzer Kräuterbrot, Gernoder Krustenbrot, Harz “tree cake”	Mushrooms: Oyster mushroom, Hexenröhrling, honey fungus, parasol mushroom, yellow boletus, morel mushroom, Schüppling
Harzer Soups/Stews: Kukkis Pea Soup, Köhlerpfanne	Nuts: acorn, beechnut, chestnut, hazelnut
Harzer Sausages: Halberstädter Würstchen, Pottsuse	Herbs: Various – ramson, yarrow, rose hip
Mustard: Halberstädter Senf, Harz Senf	Honey: Tannenhonig Kochs Harzer Landkost, Waldhonig Kochs Harzer Landkost
Breeding cattle/goats: Harzer Höhenvieh, Zimtziecke	

Finally a content analysis of fourteen national/regional promotional websites for the Harz Region helped to evaluate whether traditional Harz food products have been integrated into the image of the destination (Table 3). The following five

food themes were identified for evaluating the role of food in destination marketing.

**Table 3. Content analysis of Harz promotional websites**

<b>Food Theme</b>	<b>Frequency</b>
Traditional food products featured	6
Image of food/beverage as attraction	6
Restaurant/dining experience	9
Food events	7
Experiences linked to local foods	6
Total	34

### **Discussion**

The typical Harz tourist is older, 50Plus, and is a repeat domestic visitor, travelling independently by car with their partner. They tend to visit in the region for approximately two days and spend approximately 53€/day. The majority of visitors have obtained their travel information over the Internet. Their main motivation for coming is relaxation, which includes engaging in natural and cultural based activities such as hiking, visiting cultural sites, and participating in culinary experiences. The high percentage of visitor's engaging in culinary experiences in the Harz (85%) is largely a result of the basic fact that travellers have to eat, and are interested in value for money<sup>15</sup> as tourist expenditures are relatively low.

The inventory of typical Harz food products reveals that there is a wide range of unique food and beverage offerings available both year round and seasonally that include meat, game, fish, cheese, fruits, berries, baked goods, sweets, condiments, nuts and mushrooms on which to strengthen the regional image of the Harz. The high number of repeat visitors to the Harz and their interest in food suggests that food is part of the pull factor motivating visitors to come to the region. These visitors are likely to be more psychocentric individuals, responding to food experiences that are dependable and that they are familiar with. However, the variety of foods suggests that there are opportunities to offer not only predictable but also new potential food experiences for visitor markets<sup>16</sup> such as the "Harz Fest", a traditional food event not well known in the region.

Finally, the results of the content analysis of public national and regional tourism destination websites of the Harz reveals that 50% or less of the websites are presently featuring information, images, events and experiences linked to



traditional food and food products. Nine of out the fourteen tourism websites feature the traditional images of restaurants and dining as part of their marketing strategy. The Destination Germany website and the tourism websites for the regional federated states that comprise the Harz Region were most organized in promoting traditional cuisine while the Harz tourism websites and the local community websites based in the region tended to lack information about food.

## Conclusions

The research on culinary tourism in the Harz Region reveals that food is an important motivator for visitors to the region. The typical Harz tourist is similar to visitor profiles for culinary tourists internationally being older thus offering considerable potential in the future as this segment increases. Linking the diversity of traditional Harz food products more clearly to natural and cultural experiences offers opportunities to increase the popularity of the Harz as a destination. Finally, to strengthen the regional identity of the destination there is a need to increase the profile of local foods in the promotion and marketing of the region. As Taylor<sup>17</sup> argues this will offer potential for the region to unite existing assets, brand the area with its own unique identity, increase the tourism visit and spend per visit, and preserve the unique traditional Harz food products.

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**SECTION 6 – FOOD AND CONSUMER RESEARCH**

## **Selected methods used in consumer-oriented food product development**

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**Keywords: review of methods and techniques, consumer studies, development of new food products**

### **Abstract:**

Including the voice of consumers in the process of development and creation of a new food product boosts the chances of introducing into the market a product more attractive for consumers and more competitive, strengthening its producer's position, and providing firm grounds for its future growth. This article focuses on ten research methods applied in subsequent phases of consumer-oriented development of new food product together with examples of their use in practice. It is quite viable that in the near future food producers will more eagerly and more frequently include potential clients in the process of developing new food products, which will lower costs of the process and enhance its efficacy.

### **Introduction**

One of key factors of companies' success in increasingly more competitive market consists in offering products that respond to buyers' needs and expectations (consumer voice). In order to do that, product developers must know buyers' habits, behaviours, desires, requirements and choices, and have them in mind prior to product creation, during the process and during market launch. Taking into consideration consumers' opinions in projects focused on developing new products, brings producers many benefits such as:

- Boosts the possibility of product's market success: frequent confrontation with buyers' needs and expectations assures better product suitability, prevents weak or underdeveloped products from being launched, reduces the possibility of rejecting a concept with big, although unrecognised potential;
- Reduces time and costs of development: decisions are made on the basis of real opinions of a group of potential users, and not on guesses and speculations;

-Assures better use of a company's human resources, fewer people engaged in project (smaller work teams), and greater emotional involvement of personnel based on interaction with future product consumers;

-Easier management of product development process.

The food product development project can be perceived as a process of accumulation of knowledge on consumers, in which at the early phases product designers try to understand habits and behaviours, followed by needs and expectations of potential buyers. Then, when a concept and product prototype are developed, consumers preferences regarding the new product's features, qualities and the degree of its desirability are studied. New products are introduced into the market only, if, upon final verification (i.e. test phase), they are approved by consumers and it's viable that they will sell.

There are numerous works which support the view that many research methods are useful in consumer-oriented development of new food products. However, few of them offer collective data that would cover the entire process of development and could serve as a kind of guide for project managers working on product development in companies.

The aim of the article is to review selected methods applied in subsequent phases of consumer-oriented development of new product, and provide examples of their use in practice. Material for this work was collected by the author in the course of over two hundred research projects (conducted in the Adriant Polska company) in cooperation with marketing departments and R&D units of the biggest companies in the food industry in Poland, as well as on the basis of secondary data from Polish and foreign literature both traditional and electronic (Internet).

### **Review of methods and techniques**

Activities related to development of new product are usually presented as a linear process (tunnel model) which most frequently consists of the five following phases: (I) idea generation, (II) concept development, (III) prototype development, (IV) verification tests, (V) introduction of product into the market. Research methods that help to include consumers' voice in the process of food product creation and development may be grouped according to the product development phase they are used in (Table 1).

In the initial phases of product development, usually qualitative research methods are applied (observations and interviews) which help to understand potential buyers' needs, expectations, habits, behaviours and choices. The following are worth mentioning:

Ethnographic research which is a synthesis of a few techniques: participant observation, analysis of actual environment and qualitative in-depth interviews (IDI). The research takes place in respondents' natural habitat (e.g. home, workplace, shop, bar, etc.), with the researcher observing routine activities without intervening (as much as possible), and recording the activities for example on video tape. Analysis of such material helps to understand the context of consumers' actions, their values and objectives, and helps to discover new, so far unmet consumer needs which constitutes invaluable information at the phase of looking for new products<sup>1</sup>. Ethnographic research has been used to develop new and health fish products for children and adolescents in Denmark<sup>2,3</sup>, and low-alcohol flavour drink Breezer in France (non published research by Adriant).

Laddering is a method frequently used in in-depth individual interviews based on means-end chain (MEC) theory which helps to understand the way in which buyers relate actual product features to rational and emotional benefits, as well as to ultimate values<sup>4</sup>. Such information is very useful when it comes to defining the needs and expectations of consumers in the process of generating ideas for new products. In literature devoted to the subject, one may find numerous examples of application of the method to create diverse categories of food products<sup>5</sup>, including for example the process of development of health vegetable-based food for children<sup>6</sup>.

Lead user technique is based on inviting people who stand out among consumers (e.g. open, inventive, creative, eccentric, etc.) into active participation in product development process in focus group interviews (based on creativity groups) or work meetings where engineering and marketing personnel participate. The technique facilitates the generation of innovative ideas and creative proposals, allows users to evaluate the attractiveness of developed concepts, and to enrich them<sup>7</sup>. Earle<sup>8</sup> presents the application of the above mentioned research technique during idea generation and selection of concepts of new meat products for hotels and motels in Melbourne, Australia.

At the phase of developing concepts of new product, there is a need for both qualitative and quantitative data, which enable the preparation of a detailed description of a new product, which in turn will become guidelines for the R&D (Research and Development) Department for prototype development.

**Table 1. Research methods used in subsequent phases of consumer-oriented development of new product**

Phase	Stage	Information on consumers	Method	Example of use
<b>I Idea generation</b>	Looking for ideas	Habits and behaviours	-Ethno-graphic research (incl. observation) -Interviews (*FGI,**IDI), joint with other methods: - Laddering, - Lead user technique	Fish Products <sup>2</sup> after 3  Vegetable-based Food <sup>6</sup> Meat Products <sup>8</sup>
	Generation of ideas	Needs and expectations		
	Selection	Attractiveness of idea		
<b>II Concept development</b>	Concepts development	Product description	Work group	
	Concepts verification	Barriers in product acceptance		
<b>III Prototype development</b>	Development of prototypes and marketing mix	Optimal combination of product features and qualities	Conjoint analysis	Functional Drinks <sup>13</sup>
	Prototypes positioning	Preferences related to product	Preference Mapping	Low-fat Cheese <sup>16</sup>
	Prototype optimisation	Description of ideal product	Quality Function Deployment (QFD)	Tomato Ketchup <sup>21</sup>
<b>IV Verifying tests</b>	Product assessment	Product attractiveness	Acceptance test	Natural Yoghurt <sup>25</sup>
		Getting bored with the product	The boredom test	Chicken Soup <sup>28</sup>

	Bench-marking	Preferences related to product	Preference test	Potato Chips <sup>32,33</sup>
	Product-mix optimisation			Wine <sup>34</sup>
		Purchasing intention	Purchase Intent test	
<b>V</b> <b>Product introduction into market</b>				

\*FGI – focus group interview; \*\*IDI - in-depth individual interview

Work groups is a method which combines concept test (quantitative part conducted in sensory laboratory using difference tests methods, scaling or ranking) and focus group interview (qualitative part). Consumers individually familiarise themselves with prepared descriptions, pictures and mock-ups, assess them, and then they are invited to take part in group discussion. The method allows researcher to obtain an objective identification, and evaluation of a concept’s strengths and weaknesses, which helps to indicate the areas important to consumers, and the areas which require further modification<sup>9,10</sup>. Research conducted with the use of this methodology was run on numerous occasions by Adriant Poland (e.g. for studies on cheese with vegetables, milk desserts for kids, tea drink), however, due to their commercial nature their results cannot be published.

Methods used during the process of prototype development and optimisation aim at adjusting the product to users’ preferences, and at arriving at features sets meeting their desires. In practice, the following are frequently used:

Conjoint analysis enables simultaneous examination of preferences and market segmentation together with development of ideal products for defined buyer groups. The method consists of evaluating different variants of the same product (which are a compilation of different sets of features, and their levels), assessing the utility of each feature for consumers, and pursuant to that, foreseeing the most desired variant. The value of conjoint analysis was confirmed in the process of developing the prototype of chilled probiotic orange juice beverages<sup>11</sup>, meal complement beverages<sup>12</sup>, functional drinks<sup>13</sup>, and white cheese with strawberry pulp<sup>14</sup>.

Preference mapping is based on advanced statistical techniques and allows researchers to relate descriptive sensory data (developed by specially trained



team of sensory experts) to the consumers' preferences, and to their degree of acceptance. The method includes the development of two maps: internal (where preference of each consumer is mapped and the sensory attributes are projected on the preference map) and external (where the sensory attributes are mapped) and defining correlations between them<sup>15</sup>. Preference mapping provides not only detailed knowledge on products (reasons behind their acceptance or rejection), but also permits ideal product estimation. Preference mapping is extremely useful when developing new products, and may also be used for range extensions, improvement of existing products, screening of formulations, positioning of a range on the market. Practical application of the method may be seen in the low-fat cheese development<sup>16</sup>, reduced-calorie foods<sup>17</sup>, and kiwi fruit<sup>18</sup> (Jaeger et al. 2003).

In the course of product development many researchers pay attention to the following:

Quality Function Deployment (QFD) which is a set of interrelated research methods aimed at comprehensive planning and performing of tasks linked to consumer-oriented development of new products and further growth of already existing products. The main analytical element of the method is House of Quality (HofQ), whose preparation includes identification of consumer expectations and setting their relative significance, elaborating qualitative and quantitative description of product features (with the use of descriptive analysis techniques and physical and chemical methods), positioning of new product in relation to its competitors, defining correlations between features described in "consumer language" and the language of "technology specialists" and "product designers". The method provides guidelines on product ingredients which will determine the product acceptance by consumers and its attractiveness when compared to its competitors<sup>9,19</sup>. Practical examples of QFD application in the food industry are the development of couverture chocolate<sup>20</sup>, tomato ketchup<sup>21</sup> (Costa et al. 2001), and energy drinks<sup>22</sup>.

Quantitative consumer tests form an indispensable part of product research. They are conducted just before making a decision whether to introduce the product into the market or not. Those verifying tests are run on a representative sample of target group to check a new product's attractiveness and estimate the time to consumers' getting bored with it, as well as to find out consumers' preferences compared to competitors' products and consumers' declared purchasing intention. Examples of such tests are as follows:

The product acceptance (desirability) test which uses hedonic rating scales such as 9-point hedonic rating scales (the oldest and currently the most frequently used), ratio scales, Visual analogue scales (VAS), LAM (Labeled affective magnitude) scales, JAR (Just about right) scales, etc. The consumers' task is to mark a score on a scale to reflect his/her feelings i.e. the degree to which a given

product fulfils his/her expectations<sup>23,24</sup>. Van Trijp et al.<sup>25</sup> compared the utility of different types of hedonic scales on the basis of natural yoghurt test; Rothman<sup>26</sup> demonstrated the usefulness of the JAR scale in food product development and reformulation.

The boredom test provides information on what happens to product desirability when it is assessed (or consumed) over a longer period of time. The method enables consumers to test a product (e.g. at home) and describe the acceptance degree prior to, during, and after testing. Results of the studies on product boredom enable researchers to foresee consumer unwillingness to purchase the product again and the drop of purchasing frequency, which results in lower sales of a new product after its market launch<sup>27</sup>. In literature devoted to the subject, there are many examples of the use of the boredom test e.g. when assessing chicken soup<sup>28</sup>, chewing gums<sup>29</sup> and reduced-fat products<sup>30</sup>.

The preference test which consists in direct comparison of two samples (pair test) or more (ranking), and the respondent's task is to choose the most preferred product or ranking those products<sup>24,31</sup>. The test's results are relatively easy to streamline and interpret, which is why it is widely used to define the degree of desirability of competitor's products, consumer preferences regarding new product purchase, and its use at home. The test was applied to potato chips assessment which is related in detail by Wichchukit and O'Mahony<sup>32,33</sup>.

The purchasing intention test demonstrates respondent's willingness and intention to buy a new product from an overall perspective i.e. together with its external attributes such as packaging, price, brand, origin, etc. The test is divided into stages, and usually includes determining of purchasing intention of the product on the basis of its visual evaluation (which is to suggest a typical product selection situation at shop), and later testing it, and identifying the intention to buy it again. Apart from a comprehensive assessment of a new product, the aim of the purchasing intention test is to help understand barriers for wide product acceptance which may stem from other elements of marketing mix than the product itself. The test utility was confirmed when assessing Australian Shiraz wines<sup>34</sup> and Riesling from the German Rheingau region<sup>35</sup>.

## **Discussion and conclusions**

The main aim of new product development is to introduce into the market products which consumers will find attractive – products which will be better than competitors', and which will strengthen the position of their producers offering good perspectives for their future growth. Studies conducted by many researchers confirm that active participation of consumers in the process boosts the chance of market success of a new product and has a positive impact on the efficacy of the development process<sup>36</sup>. In modern food companies, consumers

are more and more often not only final assessors of new products, but also take an active part in the processes of their development. Who, but the consumer, knows better her/his needs, expectations, habits, behaviours, desires and requirements? Hence, it may be expected that companies will be more and more willing to include end buyers into the process of generation, development, and introduction of food innovations. Such situation will be facilitated by the following factors:

-Current low efficacy of development process: it is estimated that nearly 80% of introduced products fail within six months of their market launch, and only one in ten has a chance to remain on the market for the next five years<sup>37</sup>.

-Dynamic changes in the food market stimulated mainly by consumers. Companies which know how to run an effective dialogue with consumers, and quickly respond to changes (adjusting their offer to buyers' current needs and expectations) boost their chance of success and market survival<sup>2</sup>.

-Contemporary consumers are in a comfortable supply situation (whereby goods are constantly available), which enables them to make unconditioned purchasing decisions. More and more often, they are purchase conscious, active buyers, ready to pay more for products which will indeed satisfy their expectations.

-The need to create new and more complex products of high quality i.e. more healthy and easier to consume, with more attractive sensory features and functionally suited to individual needs of consumers.

The knowledge of consumer-oriented methods and their application in the process of development of new food products helps to come up with goods consumers really want to buy and enjoy; products which will satisfy buyers' expectations (or even exceed them) and which they will be willing to purchase again.

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## **Faster focus group interviews – CurroCus® groups – an improved approach to collecting consumer data**

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**Keywords: consumer, CurroCus® group, focus, method development, speed**

### **Abstract**

There is a need for cost efficient methods in consumer research. Existing qualitative methods are expensive to conduct, and time consuming. This paper aims to improve the focus group method. The objective was to develop focus groups to cover different aims: conduct interviews in shorter time, interview greater number of respondents, deliver results faster than traditionally analysis of data, and lower total cost. CurroCus® groups of 15-45 minutes duration were tested in five different experiments, including 70 to 160 respondents in groups of 7-11 respondents. The name of the new method is formed from the word Curro in Latin, meaning speed in English, and Cus which is the last syllable of the word Focus, thereby forming a new word on the method: CurroCus®. The results from testing of the CurroCus® group method in different cases showed that trained moderators and observers could collect responses in a given time for each group. It was possible to process the number of respondents for each group. By conducting several successive groups, saturation of information was reached after an adequate number of CurroCus® groups. Therefore, the number of respondents can be optimized and results can be more precise, with reduced risk of inaccuracy. At the same time, the cost for each case can be lowered, in our cases to approximately 1/10 of a traditional focus group cost. The role of the moderator is important. A disadvantage is the risk that some of the respondents are not able to express their thoughts when time is limited. There is need for more research on all parts of the CurroCus® group process.

### **Introduction**

This article illuminates the process of developing focus group research further as an alternative to “traditional” focus group research. The use of focus groups in consumer research is becoming presently more used and is also integrated in



understanding consumers in the field of food science<sup>1</sup>. Focus groups are used widely and in fields such as marketing, meal experience research<sup>2</sup>, consumer behaviour<sup>3,4</sup>, methodological issues<sup>5,6,7,8</sup>, and, and hypotheses<sup>9</sup>. Focus groups are a common means of data and information collection. The method can provide a various set of perspectives from groups of people and topics ranging from the most sensitive to rather more harmless topics depending on the field of research.

### **Conducting and using CurroCus® group**

The use of a faster alternative to traditional focus group interviews has been demanded by companies. For instance, in getting consumer opinions about the design of a product, small alterations can be the difference between usefulness and failure of a product. Another area that the CurroCus® group interviews can be useful is for instance a discussion of taste. What is consumers' opinion of taste? In a conference, the method could be useful in finding delegates' suggestions for topics in next year's conference.

CurroCus® group interviews are an alternative way of collecting data from group interviews, and have similarities to Traditional Focus Group (TFG) interviews. A short description of the CurroCus® group interviews follows. Written data is collected from the respondents through a few questions in the beginning of the CurroCus® group interview. It is based on an average of one question per 10 minutes of group interview. The respondents are given a limited time to answer each question, usually, one minute per question. The respondents then hand in the written answers to the moderator before the CurroCus® group interview continues with discussions between respondents in the group interview room. The interview is recorded with sound and video; the observer in a room next to the interview room observes the group and takes notes through a one-way mirror of the behaviour of the respondents. The moderator makes notes through the entire interview. All the groups in Samples (2-5) were recorded with a digital Dictaphone in an observation room, with one observer following each group and making notes as well as listening to the focus group participants' discussions.

The number of participants ranges from six to 11 persons. This is similar to the number of participants in full or mini-focus groups<sup>10</sup>, and is decided by the number that participates in each group. The duration of a CurroCus® group has been from 15 minutes to 45 minutes in the various samples. The traditional focus groups can last from one to two hours<sup>11,12,13</sup>. This is a difference in used time in TFG compared with the CurroCus® group interview. The short duration of the CurroCus® group force participants to trust their first impression or follow their intuition, thereby expressing authentic opinions' in the discussion.

The TFG has been defined by Morgan<sup>5</sup> to include three distinctive stamps: the method is devoted to collecting data, interaction in the discussion inside the group, and the active role of the moderator in creating the group discussion. The focus group interview is in the qualitative research method family. In a TFG study it is possible to compare interpretations from a number of individuals and at the same time treat the synergy of all the respondents' gathered impressions<sup>8,12,14,15</sup>. The main concern for the researcher is to engage all respondents in the focus group to express their opinion and guide the focus group discussion around the questions that are related to the discussion so that everybody in each group has the same opportunity to express their views and thoughts on an issue. TFG can be divided into three main types: full focus groups, mini-focus groups, and telephone focus groups<sup>8</sup>. The full focus groups consist of discussions lasting from 90 to 120 min and involving 8–10 persons<sup>5,13,16</sup>.

### **The CurroCus® Group samples**

Methodology for choosing participants to the groups followed a common pattern<sup>11,12</sup> similar to traditional focus groups. This paper is limited to a few pages. Therefore, one sample is described more thoroughly.

One of the samples will be described more thoroughly. The other samples followed almost the same procedure. The topic for this sample was opinion about taste, and the respondents were from the HoReCa (Hotel, Restaurant and Catering) industry representing commercial kitchens. The CurroCus® group interviews were conducted over two days. Three groups were interviewed each day, including 18 respondents on the first day and 29 respondents on the second day. The gender was equally divided between men and women. Each group took approximately 20 minutes to conduct. There are four sources of data collection that are done at the same time. Two observers monitored the interviews in another room with one-way mirrors, and reported their results. All interviews were recorded with a digital Dictaphone in the observation room. The respondents was handed a sheet of paper with two questions regarding taste, and they were given 2 minutes to answer the questions that were open ended. Thereafter all the sheets of paper were returned and analysed later. The CurroCus® group moderator followed a template with open questions regarding respondents' opinion of taste in various settings. The moderator took notes during the interviews. After analyzing the CurroCus® group interviews five main areas were disclosed about taste: use of senses, closeness, public vs. private sector, holistic experience, and potential for development.

A total number of 360 participants have been involved in the five samples in 45 different CurroCus® group interviews. Respondents have been steered into the

discussion with questions developed in a moderator interview template that has been individually developed for each sample. The samples only hold limited information since their content could include industrial secrets and are therefore anonymous.

### **Advantages with CurroCus® group**

One advantage is in samples where it is necessary to process a great number of respondents in a short time period, for example a day conference with business visitors. Then it is possible to get 10 conference delegates interviewed for 20 minutes, which could be three CurroCus® group interviews per hour. With such numbers, researchers can process 150 delegates in a 5 hour period. It is possible to get their opinion on a few specific issues for instance their experience of the food and beverage served.

Depending on topic, it is likely to reach saturation<sup>17</sup> in one day rather than after 2 weeks with one focus group each day in TFG. The CurroCus® group gives less time to linger about the topic under time pressure and participants have to reveal their first impression or the “gut feeling”. The number of participants and groups can be high in a limited time. There is an opportunity to have more than one CurroCus® group interview on the same day with the same group of people if that is required.

Another gain with a CurroCus® group is that the chance to lose concentration will be less due to shorter participation time in the discussion. Therefore, participants can be approached with the confidence that they will be spending less time than in a TFG. The intensity of the CurroCus® group demands that the moderator focuses on the task and guides the participants through the discussion. All participants need to give their opinion on the topics discussed to the best of their abilities.

The cost of carrying out CurroCus® group interviews will usually be less than compared to the TFG. This will give advantages also for the employer that can put more time and resources into analysing the collected data. Results can then be published faster. By having a larger number of groups and participants, saturation might occur on certain topics at an earlier stage. This advantage will reduce cost for companies that choose to use this method. A pleasant side effect is that the researchers, by collecting data faster, can use more time and presumably finish their analyses earlier. A suggestion from the companies participating in all samples is that the cost of a CurroCus® group is in average 1/10 of a TFG.

### **Disadvantages with CurroCus® groups**

The short time for discussion can involve less time and involvement from participants to express themselves around the topics discussed. If the participants experience that the amount of questions are not in accordance with the timeframe for the discussion they might limit their discussion so they can finish on time. There can be a risk of having less depth of the data in the CurroCus® group compared towards the TFG, because of a reduced amount of work effort spent on developing the moderator guide and questions. Another reason could be too many questions and less focus on certain topics. This can be avoided by carefully developing the moderator guide in close cooperation with the principal, and pre-testing.

Another drawback with the CurroCus® group is if the duration takes any longer than 45 minutes, then the momentum and dynamic is weakened. By testing the template, it is possible to measure the time it takes to conduct it. A disadvantage can be the short time between each group. A possible result is that an important issue raised by a participant in one group does not surface as a part of continuous development of the moderator guide.

A TFG might be able to cover more topics and get into interesting long lasting discussion, but tiredness, loss of the grip of scope, or boredom can be the results if the focus group lasts too long. Another problem common to group interviews are that social forces such as shyness or anxiety might occur among participants<sup>18</sup>. These effects could be harder to discover in a CurroCus® group than in TFG.

### **Discussion**

CurroCus® group interviews involve the combination of a short questionnaire where the participants write down their impression during a limited time and the discussion that follows does not exceed 45 minutes. This gives a possibility to compare written answers with verbal statements from the participants. Recording, observers notes, moderator notes, and written answers will give the researcher four connecting points to test the validity of the collected data.

The short time-span gives relatively short answering time, and the answers might be limited in length, but the quality of the answers is not necessarily lower than in TFG. The amount of information in the discussion will be more focused and give the discussion an impression of taking “snapshots with a camera”.

The two main differences from a TFG are: the short time duration of the CurroCus® group compared to the TFG, 15-45 minutes compared to 150-180 minutes for the TFG, and the introduction of questions conducted in a limited time in each group. When the participants arrive to the CurroCus® group, they

are informed about how it will be performed. The respondents have been prepared for the interview after the general information. In TFG that lasts, for example, 2 hours<sup>12,16</sup>, the focus and concentration might be lost. This could result in unfocused answers or discussions that go around topics with no connection to the original topics. This means that discussions can take another direction than previously thought about and new information can be gained.

Critics against group interviews have been expressed, Stycos<sup>19</sup> illuminated that group interviews have various effects, and that they will draw out information which is different to that available through individual interviews, but there are no reasons to assume that they therefore are more valid. In all the CurroCus® group interviews reported in this paper, there is consistence between the written answers and the discussions. Reaching saturation is important and in Sample 1, it was reached after eight groups. In the four other samples, confirmation of saturation came after five CurroCus® groups had been analysed.

The few questions that are asked through a questionnaire in the beginning of each CurroCus® group have its limitations. First, it will only be able to cover a few basic questions. Second, the questions in the written questionnaire are followed up in the template. Third, there is no assurance that all participants have the same amount of time to answer. Finally, the participants are expected to provide their “gut” feelings and their first reaction to the questions, and in the discussion. The moderator needs to steer the discussion with a firm hand. Otherwise, much of the discussion could be wasted on topics or directions that are not important for the issue that is discussed. The questionnaire gives each respondent the same amount of time to write down his or her answers. A narrow scope or too firm a hand might create frustration among the participants and should be avoided.

The companies involved in samples 2-5 reported reduced time, cost and efforts spent on the research. One of the interesting advantages are that companies that want to do qualitative research including a large number of participants can get it done in one single day.

To conduct CurroCus® group interviews efficiently it is important to do preparation in advance before the interviews. A well-prepared moderator guide is necessary, as is the presence of at least one or two trained observers, a trained moderator, and necessary recording equipment and facilities.

### **Concluding remarks**

The main conclusive remarks that can be made can be divided into three areas: combing collection methods, duration of interviews, and reduced cost.

The combination of group discussion, answering a few questions under time pressure, and observation by trained observers results in form of triangulation. The “tripod” gives a good indication of consistency or inconsistency in the findings at an early stage of the analysis process. A limitation is that only a few questions can be asked. It could be 4 to 5 questions in an even shorter time, but that will be tested in future research.

The relatively short time period and short duration of the CurroCus® group represent a change from how the TFG that has been conducted. For example, eight 15 minute CurroCus® groups can be conducted in the same time as a two hours TFG interview. This will give an indication of the results focusing on an issue that is being research. The number of respondents increases in a day, thereby, increasing the number of opinions and statements collected from several persons in a short time.

A criticism of academic research from industry is that it takes a long time before results are published and can be used by the industry. Using CurroCus® groups to collect data and analysing them can reduce time and save money. So far, the CurroCus® group interview method has so far proven its usefulness towards product development, and consumers’ opinion of certain topics especially concerning food related products. In the future, the usefulness will be tested regarding consumers’ experience of tourist attractions, new products, company development, and other cases.

The CurroCus® group method needs to be scrutinised more and be tested by other researchers. This will be an important task for the authors to confirm and reveal both the advantages and disadvantages by using CurroCus® groups in the future.

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**SECTION 7 – FOOD EXPERIENCES UNCOVERED**



## **Evaluation of consumer's food preferences at a Portuguese hospital food service unit – pilot study**

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**Keywords:** food preferences, consumer satisfaction, cooking methods.

### **Abstract**

**Introduction:** The priority of catering units is the satisfaction of consumers. In order to achieve this goal it is necessary to know consumers' food preferences.

**Objective:** The purpose of this pilot study was to know of consumers' food preferences at the food service unit of Oporto Hospital Centre.

**Methods:** According to a descriptive analysis, a questionnaire was applied to assess food preferences by food group cooking methods and ways of presentation.

**Results:** Consumers at the food unit prefer to eat grilled meals. In the group of meat, respondents preferred sirloin steak and turkey steak, the preferred fish specimen was cod. For the side dish, consumers choose rice and the most appreciated of the bread types was the mixed grain bread. Vegetables were less appreciated than salads and, concerning fruit, consumers prefer it raw and peeled. The favourite seasoning was olive oil. The favourite dishes mostly belong to the traditional Portuguese cuisine.

**Discussion and conclusion:** In general the results obtained are in agreement with the evolution of Portuguese Food Balance Sheets: there appears to be a correlation between preferences and food availability. Future work is necessary to analyze food preferences of specific groups of the population and evaluate a potential relationship with food intake, aiming to identify the determinants of food consumption in adults.

### **Introduction**

All successful companies have a common target: consumers' expectations. Satisfaction generates consumers loyalty and this must be the first goal of a company<sup>1</sup>.

The profile of consumers of food service units in Portugal is not well known. This knowledge is important to identify food preferences in order to adequately

provide food options and menus, enabling catering companies to attract more clients.

Considering the number of people using food service units these have been responsible for an increased role in Public Health <sup>2</sup>. In Portugal the two main catering companies distribute approximately 250000 meals daily <sup>3,4</sup>.

In a report by the International Work Organization (2005) <sup>5</sup>, it is stated that companies that supply their workers with a healthy diet may achieve rewards of reduction in absenteeism and labour accidents. A healthy diet is a relevant factor for workers' welfare as important as protection against chemicals or noise, representing a major role in management<sup>5</sup>.

According to Antunes and Rita (2008)<sup>6</sup> and Padrão (2009)<sup>7</sup>, there are several benefits related to consumers satisfaction evaluation: positive consumers perception in relation to the company; precise and actual information concerning consumers' needs and expectations; establishment of loyalty and trust relationships. Fundamentals of marketing applied to food service units are evaluation of physical, psychological, individual and group needs, evaluation of individual preferences, cultural determinants and evaluation of products and services related to tendencies and buying power<sup>7</sup>.

According to Creed (2001)<sup>8</sup>, the potential of catering companies is dependent on the ability to answer the needs and expectations of their clients, concerning nutritional value, sensorial characteristics, convenience and safety of their products.

The purpose of this study was to know of consumer's food preferences at the food service unit of Oporto Hospital Centre. These consumers are hospital staff and health students who are practicing at the hospital. The food system is cook and serve and there are four available menus every meal (fish/meat/vegetarian/diet dish).

## **Methods**

A descriptive study was developed aiming to identify consumers' food preferences of a hospital food unit. A questionnaire was developed including 36 close ended questions. The preliminary version of the questionnaire was applied to several employees followed by an interview, in order to refine its format. Data collection was carried out in June 2010. Besides socio demographic characterization, the main variables evaluated were preferences by food groups, cooking methods and ways of food presentation. A convenience sample was used and it was composed of individuals who volunteered to answer the questionnaire available at the canteen. Statistical analysis was performed using

*Statistical Package for the Social Sciences (SPSS®)* version 17.0 and Microsoft Excel Professional edition 2003®.

## Results

There were 93 questionnaires collected. Respondents average age was  $32,7 \pm 9,5$ . The majority of respondents belonged to the female gender (76,3% women vs 23,7 men), in agreement with the general human resources at the Hospital Centre. A higher number of female respondents preferred to follow a specific diet (Table 1).

**Table 1. Sample distribution according to sex and specific diet followed**

	<b>Women</b>	<b>Men</b>
	n = 29	n = 7
	n (%)	n (%)
<b>Specific diet</b>		
Low in salt	4 (13,8%)	5 (71,4%)
Low in fat	15 (51,7%)	1 (14,3%)
Caloric restriction	9 (31,0%)	1 (14,3%)
Lactose restriction	1 (3,4%)	0 (0,0%)

The preferred cooking method was grilled by the majority of consumers. In the group of meat, respondents preferred sirloin steak and turkey steak, the preferred fish option was cod. For the side dish, consumers chose rice and the most popular of the bread types is the mixed grain bread. Vegetables were less appreciated than salads, and fruit is preferred by consumers raw and peeled. The favourite seasoning was olive oil and the favourite dishes mostly belong to the traditional Portuguese cuisine. Sample choices can be seen at table 2.

**Table 2. Sample distribution according to the favourite items of each food groups**

Food groups	Favorite item	n (%)
Red meat	Sirloin steak	24 (26,9)
White meat	Turkey steak	20 (22,6)
Fish	Cod	23 (25,8)
Seafood	Shrimp	53 (58,1)
Vegetable protein sources	Mushrooms	43 (54,8)
Pulse	Peas	21 (24,7)
Cooked vegetables	Broccoli	14 (16,1)
Raw vegetables	Lettuce	45 (49,5)
Seasonings	Olive oil	28 (32,5)
Side dish	Rice	47 (52,7)
Bread	Mixed grains	30 (33,3)
Fruit	Cherri	12 (14,0)
Desserts	Chocolate mousse	11 (11,8)

## Discussion

Due to the lack of studies concerning food preferences evaluation either in Portugal or abroad it was difficult to establish comparisons.

As the questionnaire was applied at the end of spring this may probably have influenced the results, namely concerning the preference for salads instead of cooked vegetables. According to the study developed by *Growth from Knowledge*, commented by Feliciano (2010)<sup>9</sup>, soup consumption in Portuguese adults increases 71% in Winter when compared to 43% in Summer. The same study showed that the majority of adults replace soup by salads (46%), fruits (30%) or cooked vegetables (26%)<sup>9</sup> depending on seasonality; these are results similar to those found in our study.

The preferred fruit by respondents was cherry probably due to the time of the year of the questionnaire administration, a similar influence as reported in several food frequency questionnaires <sup>10</sup>.

The analysis of Portuguese Food Balance Sheets is in agreement with the tendency of increased availability of some food items preferred in this study, namely codfish, rice and olive oil <sup>11, 12</sup>. Olive oil accounted for more than 30% of preferences among several items such as spices, aromatic herbs, sauces and other seasonings. This tendency is in agreement with results observed on olive oil availability, one of the lasting traditional characteristics of the Mediterranean Diet <sup>12</sup>, as described by Almeida (2008)<sup>13</sup>, Cruz (2009)<sup>14</sup> and Cruz (2000)<sup>15</sup>. The preference of garlic may have also the same origin <sup>14</sup>.

The preference of lettuce, tomato and carrots in salads (72,1%), mushrooms and corn combined with rice or pasta may be explained by factors described by Alves et al. (2005)<sup>16</sup> such as the familiarity with foods and price. The fact that none of the respondents referred to dislike of vegetables or fruits may not correspond totally to the reality since these answers may be affected by the social desirability as described by Barros et al. (2005)<sup>17</sup>. Frequently an over reporting of fruit and vegetable consumption can occur, as also found in food frequency questionnaires.

Garcia (2003)<sup>18</sup> in his paper about food culture globalization states that emphasis on traditional items and practices was the main focus of many food advertisement in the eighties and nineties, and when compared with previous decades it was the one that increased more. This tendency for searching cultural identity is visible in our study as the respondents refer to their preference for Portuguese traditional menus, as well as for traditional Portuguese food items, such as olive oil and codfish. The same tendency was observed for preferences of sweet dessert with approximately 36,5% of preferences for traditional Portuguese desserts, such as Milk cream, Vermicelli, Pudding, Sponge cake and Rice pudding.

Approximately 37,6% of respondents showed willingness to pay more for a meal made with organic ingredients (5,3€ *versus* 3,8€). According to Meyer (2007)<sup>19</sup>, the tendency in the next 10 to 20 years in Europe will be the increase of eco-biological agriculture based products. Ormond (2002)<sup>20</sup> considers that organic agriculture is the recovery of ancient practices, nevertheless adapted to modern agricultural technology with the aim to improve productivity, food quality and reduce negative influences on ecosystems. No literature is available that evaluate adoption of Portuguese consumers to items from this type of agricultural practices, but indirectly it is clear that it is a growing market. According to the Development of National Plan of Biological Agricultural (2004)<sup>21</sup>, the number of organic producers in Portugal has increased from 73 in

1993 to 1174 in 2003 suggesting the increase of consumers' search for these products in the last decade.

Ideally the population target of this study was the totality of Oporto Central Hospital workers, students and occasional users of the food unit. Nevertheless since the sample was selected by convenience it can not be considered representative<sup>22, 23</sup>.

## Conclusions

Further work is considered necessary using a representative sample of the population, based on random selection of respondents or comparative studies between different groups of the population. Another possibility would be to analyze potential relationships between food preferences and consumption, aiming to identify determinants of food consumption. Data obtained may help nutritionists and food service managers in their task of improving consumers' expectations and consideration of food preference on menu planning.

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## **Aesthetics as a parameter of meal satisfaction**

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**Keywords: aesthetics, meal experience, plate, context**

### **Abstract**

**Introduction:** Work on the importance of the design of the plate on the meal experience is rare. The plate is a common part of the meal context, and it is assumed to affect expectations as well as experience.

**Method:** In two qualitative studies, lead-users have been observed in the analysis of the plate and meal interaction.

**Results:** The results indicate that the participating lead users perceived that plate design, in terms of colour and pattern, as well as the meal composition, of shapes and colours, affects meal satisfaction.

**Conclusion:** Aesthetics is suggested as a parameter of meal satisfaction.

### **Introduction**

Studies of designers', chefs' and waiters' aesthetic work with plates and meals are uncommon. Work is rare on what the plate interface is with the meal within consumers' meal experiences. In the restaurant world, it has long been known that context is of great importance for the meal experience of the guest<sup>1,2</sup>. The design of the meal artefacts are essentially functional in nature – to eat with, to eat on, to drink out of. The shape of the different objects has evolved over time. Originally, they had the character of tools but decorative and representative design has become increasingly important. When more people have the financial ability to not only meet the strict functional aspect of the meal, to be satiated, then the meal changes, and the demand for decorative utensils to create a beautifully set table increases. The significance of the meal artefacts as status markers escalates with growing prosperity.

An increasing number of food studies seem to confirm that aesthetic expressions affect expectations, which in turn affects the dining experience, nutrient uptake and satiation<sup>3,4</sup>. It is known that the design of a wine glass affect the experience of wine<sup>5</sup>. Maybe the shape and appearance of the plate affects and creates



expectations that influence the meal experience. When it comes to the plate relevant to the meal experience, there is an important experience-based knowledge to seize. According to Watz<sup>6</sup> the plate can be seen as a space where the movement and rhythm of the meal is reflected by carefully adapting the shapes and colours of the food to the shapes, colours and surfaces of the plate. When we eat and drink during a meal we often feel a whole in which colour, shape, smell, taste and texture are in harmony. How food is presented on a plate have been highlighted as one of several important factors for us to perceive the food as tasty<sup>7</sup>.

Sobal and Wansink<sup>8</sup> described the platescape as one of four built environments that “provide a subtle, pervasive and often unconscious influence on food choices, food intake, obesity and health”. The knowledge of what this impact is and whether it can be controlled is still very limited. Sobal and Wansink<sup>6</sup> saw opportunities in shaping the food intake by reengineering the built environments, and the opportunities are probably even greater. It is of great interest to identify if and how plate design attributes affect our food choices, food intake, satiety, and food experience.

## **Methods**

This article describes two different qualitative studies where lead-users were used. Lead-users are considered to be exploratory and critical stay; they ahead in their field and meet customers/guests/users who have higher demands, earlier, than the average customer/guest/user. They also have great advantages in finding solutions to their needs<sup>9</sup>. To highlight the current research question the choice of lead-users was natural.

In the first study four professional restaurant people were observed during an assignment to illustrate how different visual and sensory impressions interact in the experience of a meal, with special focus on the importance of the design of the plate. A further user perspective was added by allowing the participants to consider how the matter should be investigated and which method they would use to do this.

The aim with the second study was to provide a number of different variables of food and plates to observe the participants' behaviour in a choice situation. The participants' different experiences of working with meals (cooks, academics, designers, creators, artists) provided both scientific, aesthetic as well as a craft perspective on the plate relative to the meal<sup>8</sup>. The study intended to show how the participants selected a plate and put on it food from a buffet, and also to examine how different professionals explain their plate selection, meal selection, arrangement and subsequent experiences. The participants were instructed before the study that they were participating in a study, and that their meal

compositions were to be photographed before they could start eating. The question was whether they would consider their meal “tasty and beautiful”. Participants were asked to write down their reflections about the meal, with no further instructions. Seventeen participants chose a plate and then what foods should be on it. Participants could choose from three different plates, one blue-patterned, one white and one black. Chicken leg was the single protein component and the three carbohydrate options were all flavoured with lemon, thyme and parmesan. Besides these components there were seven vegetable options and four sauces in drip bottles to choose from as well (Table 1).

**Table 1. The components on the buffet**

COMPONENT	TYPE	COLOUR	SHAPE
Protein	Chicken leg	brown	irregular
Carbohydrate 1	Polenta cube	yellow	square
Carbohydrate 2	Potatoes with skin	brown	spherical
Carbohydrate 3	Risoni	white	spindle
Vegetable 1	Beluga lentils	black	spherical
Vegetable 2	Baby spinach	green	irregular
Vegetable 3	Green beans	green	oblong
Vegetable 4	Beetroot sprouts	red	irregular
Vegetable 5	Carrot flowers	orange	flower
Vegetable 6	Roasted hazelnuts	brown	spherical
Vegetable 7	Pea shoots	green	irregular
Sauce 1	Garlic sauce	white	fluid
Sauce 2	Tomato sauce	red	fluid
Sauce 3	Balsamic vinegar	black	fluid
Sauce 4	Rapeseed oil	yellow	fluid

The meal was documented with photographs of the buffet and the compositions of each participant ,and also through their self-written reflections. The compositions and reflections could subsequently be linked to each participant.

## Results

The participants in the first study concluded that there was not one plate that was optimally designed for all the dishes. Different plates fit differently for different dishes. They chose to examine whether there was a most and least suited plate for a specific dish and if the plate design affects meal experience. They agreed on a dish consisting of classic stew (brown), and potatoes (bright yellow, spherical shapes). At their disposal, they had 80 round plates of similar size with different colours and patterning. The participants were united in the decision of the plates which were most and least suited for the selected stew. The plate least wanted to accompany the dish was the Paratiisi plate from Arabia (Figure 1). Participants' choice of most suitable plate was Spisa Ribb from Gustavsberg (Figure 2).

**Figure 1. Paratiisi, Arabia    Figure 2. Spisa Ribb, Gustavsberg**



The participants decided to try the two plates with stew and potatoes in their own home environments in order to investigate whether they could pay attention to any difference in the experience of the meal between the different plates. Amongst all participants, the experiences were perceived to be different depending on the dish that was eaten. The food tasted the same but the overall experience was perceived to be better on the most appropriate plate. The participants emphasized that they could distinguish between sensory experience and overall experience, but that a more untrained customer/user may not make any distinction of these. The participants noted that their choices were most probably influenced by the contemporary style and knowledge of what is modern.

Adjectives used often on Spisa Ribb were fresh, clean and harmonious. The comments about the meal eaten from the Paratiisi were more of a negative character: “it look cluttered / ... / which is perceived as stressful” and “the food

is lost in the jumbled pattern”. Participants also observed that the pattern on the plate seemed to affect how much food they added on the plate.

The results of the second study showed that the majority of the participants put more focus on the appearance of the meal than on the taste of it, when they could choose among plates and meal components. Several of the participants indicated that their choice was based on aesthetics rather than taste, which is why some participants found that the meal looked better than it tasted. The various sauces in tubes were appreciated as something to “paint” with and sometimes the plate compositions were described as canvases. Colours were linked to adjectives. Black was dramatic, black together with yellow was considered striking and impressive, colourful food was seen as healthy and beautiful; green symbolized adjectives like nice, appetizing, and relaxing.

The different plates resulted in different types of compositions. The black plate was most popular and was described as an appealing setting, a background that emphasizes, and added a beneficial contrast to the warm colours of food. Some described the yellow polenta as a start-up followed by a choice of the black plate. Several combined the black plate with yellow, red and orange meal components. Those who chose the white plate had varied types of arrangements, from generous rustic compositions, well-filled, and with lots of green components, to more fastidious with small daubs. The white plate was described as honest, a dish that highlights the food well but needs colour. The blue-patterned plate was described as classic and was also the base for classical compositions. The blue colour was considered a soft hue and a good background colour. The participants expressed a feeling of not noticing the food on the plate because of the pattern being energy-consuming. Heavy classical cuisine was considered most suitable to serve on these plates.

The experiences of the meals were on the whole good, but some noted that they took too little of all, too little of the sauce, or made some strange combinations. One participant was hungry for the beauty and opted out of the good that did not fit. Other participants opted out of vegetables or certain colours for a more aesthetic composition. Some commented on the experience of the defoliated plate. The experience was deemed unpleasant in that the plate looked dirty and smeared out.

## **Discussion**

The aim with the study was to investigate aesthetics as a parameter of meal satisfaction. The context is known to be important for the meal experience<sup>1,2</sup> and the significant role of the plate as a frame of the meal was clarified in the two studies. The plate considered the most suitable in the first study was described as putting the meal in the centre and bringing “only a framework”. The least

suitable were seen as competing with the meal with the amount of pattern and colour. A particular design on the plate might enhance the interpretation of the shapes and colours of the meal, just as a particular form of a wine glass enhances the wine's flavour<sup>3</sup>.

The quest for better food experiences could be described as a concern in a welfare society, for those who already have food. The knowledge of how the plate design can improve the meal experience may then seem to be a knowledge that only adds to a very small percentage of people. But we also know that nutrient uptake from a 'nice' meal is higher than the nutrient uptake from an unsatisfactory meal, and that the amount of food put on the plate and the amount eaten are affected by the plate<sup>6</sup>. Maybe the need for the beautiful comes earlier in the ladder of needs?

Results indicate that participating lead users perceive that both the plate design, in terms of colour and pattern, and the meal composition, of shapes and colours, affect meal satisfaction. In the first study, where the plates were varied and the meal was constant, the participants perceived that experiences vary depending on the plate. The food tasted the same but the overall experience was perceived to be better on the most appropriate plate. This is supported by Klosse et al.<sup>7</sup> who found that the way food is presented on a plate is one of several important factors for us to perceive the food as tasty. In the second study, the dishes and the meal components were varied and the participants found in some cases that the meal experience was less good when they opted for a good appearance. What the eye wanted was not always the best choice for the resulting taste experience.

In both studies, participants held that there is no optimum plate suitable for all dishes. They advocated different plate designs for different dishes, depending on the meal type, shape and colour. Participants of the first study stated that they needed to address the same meal in order to determine the plate that gave the best and worst impression. In the second study it was possible to see differences in composition between the three different plates. The participants often started from the plate appearance when they selected what to put on the plate. The results suggest that aesthetics is a parameter of meal satisfaction.

## **Conclusions**

The limitations for generalizations of this study are obvious. Two minor qualitative studies have been presented, involving small groups of professional Swedish lead users. Even so, the study has generated more knowledge and understanding of aesthetics as a parameter of meal satisfaction. Results indicate that these participating lead users perceive that both the plate design, in terms of

colour and pattern, and the meal composition, of shapes and colours, affect meal satisfaction.

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## **Has ‘foreign’ food internationalized New Zealand’s cuisine?**

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**Keywords:** cookbooks, New Zealand, traditional dishes

### **Abstract**

Traditional New Zealand (NZ) cuisine was similar to that of Britain. The majority of early settlers who came to New Zealand in the 19th century were British and British immigrants predominated until the 1950s. Maori foods were part of NZ cuisine by the beginning of the 20<sup>th</sup> century but not identifiable as discrete recipes in cookbooks as Maori was originally an oral culture. The aim of this paper is to investigate internationalization of NZ cuisine in the 20<sup>th</sup> century.

To investigate this claim, cookbooks were used as evidence of the incorporation of ‘foreign’ dishes into NZ cuisine. A random selection of NZ cookbooks published for each decade between 1900 and 2000 was selected as well as community cookbooks of contributed recipes from a private collection beginning in the 1960s.

Results showed the most prominent ‘foreign’ dishes in the early period were curry and kedgeree and these had probably arrived via Britain. Community cookbooks included a few ‘foreign’ recipes before 1960 but it was noticeable after this date their popularity increased with Italian and Chinese dishes prominent.

Today traditional dishes associated with the original British settlers no longer dominate NZ cuisine. As a multicultural country with a wide variety of local and imported ingredients, foreign dishes abound. NZ cuisine has emerged on the international stage.

### **Introduction**

‘Foreign’ food has changed New Zealand (NZ) cuisine. Panayi claimed in Britain ‘foreign’ food changed traditional [national] British cuisine. Food he believed had nationalities associated with a particular country or ethnicity. In Britain he maintained the concept of ‘foreign’ food was born in relation to traditional food<sup>1</sup>.

‘Foreign’ literally means outside. In Britain it was a term often used to indicate food from a ‘foreign’ country adopted into the national cuisine. *Mrs. Beeton’s Family Cookbook* (1907) for example included a new section on Dominion and Foreign Cookery<sup>2</sup>.

The idea of a national cuisine in the past has been typified by the idea of a traditional cuisine based on the foods produced in a country. In NZ the concept of traditional food was originally associated with the food of early immigrants, mainly from Britain who settled NZ from the mid 19<sup>th</sup> century. Food production and the climate in NZ was similar to Britain hence immigrants were able to replicate British culinary traditions.

Maori foods also contributed to early NZ cuisine but Maori was originally an oral culture and written recipes were not used. Hence the incorporation of Maori food into early traditional NZ cuisine was not detectable from a study of NZ cookbooks. Maori had reached NZ shores by 13<sup>th</sup> century and their culinary traditions based primarily on fishing and horticulture were well established when the first British immigrants arrived. British settlers were not familiar with foods such as kumara and corn which was widely grown; however recipes for kumara which is similar to American sweet potato and corn, also a New World food were sourced from American publications and adopted into early NZ cuisine by the British<sup>3</sup>.

Today NZ cuisine like that of the UK has evolved to include many ‘foreign’ dishes. The aim of this paper is to investigate the process whereby ‘foreign’ dishes have internationalized NZ household cuisine.

## **Methodology**

(a) A random selection of 1-2 NZ published cookbooks from each decade between 1900-2000 was analyzed and the inclusion of ‘foreign’ dishes recorded.

(b) ‘Foreign’ recipes highlighted in the database of a private collection of mainly community cookbooks of Helen Leach (HL) 1960-2000 were recorded<sup>4</sup>.

‘Foreign’ recipes were identified in the cookbooks by a ‘foreign’ name (non English) or country of origin prefix e.g. ‘Spanish’ tomatoes. A ‘published’ cookbook indicated an authored cookbook produced by a recognized publisher. A ‘community’ cookbook was usually a fundraising cookbook of contributed recipes therefore a good indicator of acceptance of the dishes into the local cuisine.

Maori recipes that were included in cookbooks were not considered ‘foreign’ according to the definition used in this paper as traditional Maori foods were already part of NZ cuisine at the beginning of the 20<sup>th</sup> century<sup>5</sup>.



## Results

For the first fifty years of the 20<sup>th</sup> century results from published NZ cookbooks showed Indian style dishes such as curry, kedgeriee and mulligatawny soup to be the most common ‘foreign’ recipes<sup>6 7 8 9 10</sup>. By the late 1950s ‘foreign’ recipes in published cookbooks were predominantly Indian, Italian and Chinese. Curries, Italian spaghetti, spaghetti and meat balls, chop suey and chow mein were common examples, while Greek moussaka was another popular dish<sup>11</sup>.

From the 1960s the most popular ‘foreign’ recipes in the community cookbook collection in ranked order for each decade were: 1960s, pizza; 1970s, moussaka, pizza; 1980s, lasagne, pizza, ratouille; 1990s, lasagne, pizza, guacomole, frittata, hummus<sup>12</sup>.

The *NZ Women’s Weekly Cookbook* (1971) included recipes from the test kitchen of a popular weekly magazine of the same name. The test kitchen established in 1965 by Tui Flower a NZ food writer had attempted to introduce what critics termed ‘foreign’ muck’ to NZers. Flowers’s answer to this criticism was to continue to include ‘foreign’ ingredients such as olive oil and garlic in her recipes but she gave the recipes English names. Coq au vin for example became chicken in wine<sup>13</sup>.

In the 1980s *The Really Reliable Cookbook* (1987) based on recipes published in a high circulation daily newspaper the *NZ Herald* included many Italian style as well as Middle Eastern dishes<sup>14</sup>. In the 1990s a popular cookbook by a well known NZ food writer *The Best of Alison Holst* (1991) had ‘foreign’ recipes incorporated into many of its sections while 13/39 recipes in the starter and snack section were ‘foreign’<sup>15</sup>. In 1998 the *Edmonds Cookery Book* a popular cookbook found in most NZ households included an ‘international’ section. Moussaka, curry and pizza featured while lasagne and Bolognese sauce with spaghetti were included in a newly created pasta section, signifying pasta dishes were now an accepted part of NZ cuisine<sup>16</sup>.

## Discussion

The results suggested Indian style dishes based on curry powder were popular in NZ cookbooks from the beginning of the 20<sup>th</sup> century but less prominent at the end. The standard NZ Indian style curry recipe added curry powder and other ingredients such as apple and chutney to mainly leftover meat which was served as a lunch dish<sup>17</sup>. More authentic Indian recipes using a traditional range of spices and ingredients were not included as households were unlikely to have either the range of spices or the traditional ingredients required to create such dishes. Recently Indian restaurants and takeaways have become popular in NZ.

Ready prepared sauces and frozen Indian dishes in supermarkets have made available convenient forms of curry such as butter chicken, lamb korma, and rogan josh; consequently NZ tastes and expectations of Indian food have now surpassed those created by earlier curry recipes in household cookbooks. Hence 'curry' recipes in recent cookbooks have declined.

Italian style dishes like Indian dishes were also part of the NZ repertoire of 'foreign' dishes from the early 20<sup>th</sup> century. Analysis of the community cookbook collection suggested from the 1970s authentically named dishes such as lasagne and pizza have become more common.<sup>18</sup> Pasta dishes like lasagne became acceptable as main meal dishes for household cooks as they were a convenient one dish meal which could be served simply with a salad. Lasagne might also be created as a vegetarian dish. Similarly pizza might be served with a salad as a main meal or as a vegetarian dish. Acceptance also related to traditional Italian ingredients such as oregano and basil and garlic now being tolerated by most NZers rather than regarded as 'foreign muck'.

Chinese style dishes were included in NZ cookbooks from an early period but became more common in the 1960s after *Chinese dishes for NZ* (1958) popularized Chinese recipes for the NZ public<sup>19</sup>. The few dishes that appeared prior to this date were given the descriptor Chinese, because of their signifying ingredients. China pudding for example was a jelly with cooked rice folded in<sup>20</sup>.

These examples suggest the acceptance of 'foreign' dishes into NZ cuisine was gradual but accelerated in the 1960s. Both Italian and Indian dishes underwent what Chiarco<sup>21</sup> refers to as translocation. This she stated involved the translation of dishes by cooks in a certain place and time into a new culture. It may involve the substitution of ingredients or the simplification of the method but as long as the dish related to its source this may be all it required for recognition. For example 'foreign' dishes like pizza in NZ can have mussels added as a topping, and a curry may be made with curry powder, include apples and sultanas and be served with accompaniments such as shredded coconut and peanuts.

Hence does internationalization of a cuisine require authenticity of dishes? Recipes may take a new form at different times in different places and may even acquire a new name. Leach<sup>22</sup> suggested this phenomenon occurred because recipes evolve and ideas change while Chiaro<sup>23</sup> claimed recipes undergo different translations in different cultures. Recognition of a dish as 'foreign' however may depend not only on the ingredients but also on the flavour. Many cuisines according to Rozin<sup>24</sup> have well established flavour principles e.g. Chinese dishes may be characterized by soy sauce and ginger, while for other dishes the choice of main ingredients such as pasta in Italian dishes or the preparation method as for French dishes may be the point of recognition. Internationalization of a cuisine presupposes translocation of a recipe; therefore as long as its origin is recognizable, authenticity may not be a factor in making

this claim. But if the true meaning of authenticity presupposes a local dish made by local people, authenticity is a claim that cannot be made for any ‘foreign’ dish prepared in a host country.

NZers culinary tradition goes back to the early settlers who initially adapted their own recipes to the environment and the availability of ingredients. Foreign dishes were spasmodically added and adopted into NZers culinary repertoire as indicated by NZ cookbooks. Some dishes have retained their original name others had a prefix designating the country of origin. Michael Symons<sup>25</sup> suggested NZers first became more open to new dishes in the 1960s following on from the culinary revolution in America and elsewhere. Helen Leach<sup>26</sup> also recorded an upsurge in interest in other cooking styles at this time, while the catalogue of the Dunedin Public Library (NZ), that had a rapid increase in the acquisition of foreign cookbooks between 1960 and 2000, also pointed to this trend. This interest in ‘foreign’ dishes also appeared to happen concurrently in many countries e.g. Belgium, Holland Norway and Denmark<sup>27 28 29 30</sup>. Like NZ these were agrarian countries and were not as open to ‘foreign’ immigration in the earlier part of the 20<sup>th</sup> century as was the UK, which had experienced waves of immigrants from different cultures throughout the century. As a result foreign dishes had earlier in the 20<sup>th</sup> century formed part of British cuisine. Today a list of Britain’s 10 favourite dinners determined by a poll held by the BBC in 2003 found that spaghetti Bolognese and curry and rice were the nation’s two most favourite dinners<sup>31</sup>.

## Conclusion

By the end of the 20<sup>th</sup> century NZ was a multicultural country. The British origin and dietary habits of the earlier population were no longer dominant. The availability of ingredients for ‘foreign’ dishes, the convenience factor associated with the preparation and cooking of many of these dishes, the low cost of their ingredients and the view that this style of cooking might be more healthy have aided this process. If the condition for internationalization of a cuisine is the acceptance and adoption of ‘foreign’ dishes into a national cuisine, NZ cookbooks demonstrate this criterion has been fulfilled.

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## **Authenticity and the evaluation of food and drink providers: Reflecting on the experience of judging establishments for regional food awards**

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### **Abstract**

As a result of, alongside, or as a prequel to, a renaissance in varying aspects of British food and drink production and consumption a number of organisations have been formed. Many of these organisations run competitions and awards to celebrate the best of what they are trying to achieve. The judges of these awards are often chosen on the basis of a complex balance of relationships and mutual understandings as to each party's ideas about food. In this paper I compare this dynamic to previous ideas as to how authenticity is determined, and suggest that consumers must take into account this process when considering the potential value of such awards as a recommendation for consumption.

### **Introduction**

For the past 10 years I have been a judge for a food promotion organisation and intermittently a judge for other food awards. During this time I have had to assess a broad range of products and companies involved in all stages of the food supply chain. In order to do this I needed to appreciate the nature of the parent organisation, its aims, objectives and guidelines for assessing, whilst at the same time reconciling these with my own views of quality, within this particular context. Whilst not necessarily being a question of 'what is authentic', this process is an example of a form of accommodation akin to that by which we determine authenticity. In this paper I discuss this process, comparing and contrasting it with a simple model of the process of authentication as described in Beer<sup>1</sup>.

### **Speciality food producers**

Throughout the UK there are many different organisations that take an interest in food and drink. This, along with a significant increase in food journalism of all types -newspaper, book, radio, Internet, television- and the growth of the cult of the celebrity chef, have marked a renaissance in British food. This revitalization of British food culture has been described and celebrated by

authors such as Hardyment<sup>2</sup>, Mason and Brown<sup>3</sup> and Stein<sup>4,5</sup>. Whilst others such as Schlosser<sup>6</sup> and Blythman<sup>7</sup> have sounded cautions, particularly with regard to the industrialization of the food supply chain. The tensions between the successes and the fears are well illustrated by the reflections of Fearnley-Whittingstall<sup>8</sup>.

The organizations initially referred to vary in size and objectives. Some are specifically designed to promote a form of food production such as organic (Soil Association<sup>9</sup>, Organic Farmers and Growers<sup>10</sup>), biodynamic (Biodynamic Farming Association<sup>11</sup>) or permaculture (UK Permaculture Association<sup>12</sup>.) Others may focus on a specific product such as cheese (West Country Farmhouse Cheese Makers<sup>13</sup>) or Devon Beef (Devon Cattle Breeders<sup>14</sup>), or a geographic area (Taste of the West<sup>15</sup>; Food and Drink Devon<sup>16</sup>.) Those organisations founded on a geographic basis tend to have originated from collectives based on food producers, retailers or the hospitality industry. Initially they may have been founded independently, but subsequently many have used government funding/support to develop their operations.

### **Competitions and awards**

Almost all these organisations have a system of awards or competitions. These are designed as a form of celebration in their own right, but also to highlight excellence within the organisation and to promote the organisation and its products to those outside, in particular, potential consumers. Judges for these awards come from a variety of backgrounds. Most are chosen by association with the organization. There is some informal process whereby members of the organization gain an opinion that the particular individual has sufficient standing to be a judge, the appropriate skills to assess (practical and administrative) and has a vision of the awards and a set of values that is aligned with those of the organization. Often the process for appointing judges is very informal, unwritten and almost on occasions liminal.

The last criteria listed for a judge, that she or he should 'have a vision of the awards that is aligned with that of the organisation', is on the face of it, of paramount importance. Individuals join organisations because of a common shared interest. In the case of many of these organisations this interest is both philosophical and commercial. Often it is difficult to uncover the characteristics or values that are shared by the members of some of these organizations. For example on examining the Organic Farmers and Growers website I did not find it immediately apparent as to what beliefs underpin the organization. In the "About Us" section there is a lot of detail relating to their certification role, but not much about their underlying philosophy. This can be found in another section which talks about organic farming. It is here that we find that their

actions are underpinned by concerns for sustainability, animal welfare, health, empowering farmers and growers and reconnecting the public with farming and food.

In the section, "about us" on the Taste of the West website the statement relating to the nature of the organization was more vague. They aim to champion the South West Region of the United Kingdom's:

*Exceptional Food & Drink Identity. Taste of the West, established in 1991, is the regional food and drink trade organisation for the South West of England. As a membership organisation Taste of the West works to develop the region's exceptional regional food and drink industry.*<sup>15</sup>

This could represent a variety of interests. West Country Farmhouse cheese makers are a little bit more explicit. On their website they state that:

*We're a small group of farmers based in the South West of England and we share a passion for the traditional art of cheesemaking. Every one of our Cheddars is made in the West Country, by West Country families using West Country milk. That's why we can call them West Country cheeses. Every one of our authentic cheeses is made on the farm. That's what makes them authentic Farmhouse cheeses. Every one of them is made by hand. That's why we can call them handmade. It's the care and expertise of our cheesemakers and the different geographical locations of our farms that gives each of our cheeses a character of its own. Our Farmhouse cheeses have a lingering, full-bodied and complex flavour with a start, a middle and an end, and their texture is substantial yet temptingly crumbly.*<sup>13</sup>

This provides considerably more detail. Even so in each case there are specific words that need to be defined. What does authentic mean? What is a regional food or drink? Even terms such as local are not easy to define. In a focus group conducted in the South West of England<sup>17</sup> participants were asked what they thought 'local food' meant,

*H; what I would think, that it was regional food, food from the South West of England.*



*B; I would tend to think that it was from localities. I like a lot of the food from Dorset but I would tend to think that Dorset food would not be local food for me living here right to on Exmoor [Exmoor is a specific area of 250 square miles in the South West of England]. I would tend to think that it was more from North Devon, North and West Somerset.*

*L; well I live in a village near Exeter [County town] and I tend to think that anything that is not within 6 miles of the village isn't local.*

*P; (from Exmoor); and I tend to think that it would have to be from Exmoor.<sup>17</sup>*

In 2007<sup>18</sup>, Whole Foods Market an American organic food chain was reported to trading standards in London for, it is thought, calling food sourced throughout Great Britain as local. David Doctorow of Whole Foods Market countered by saying:

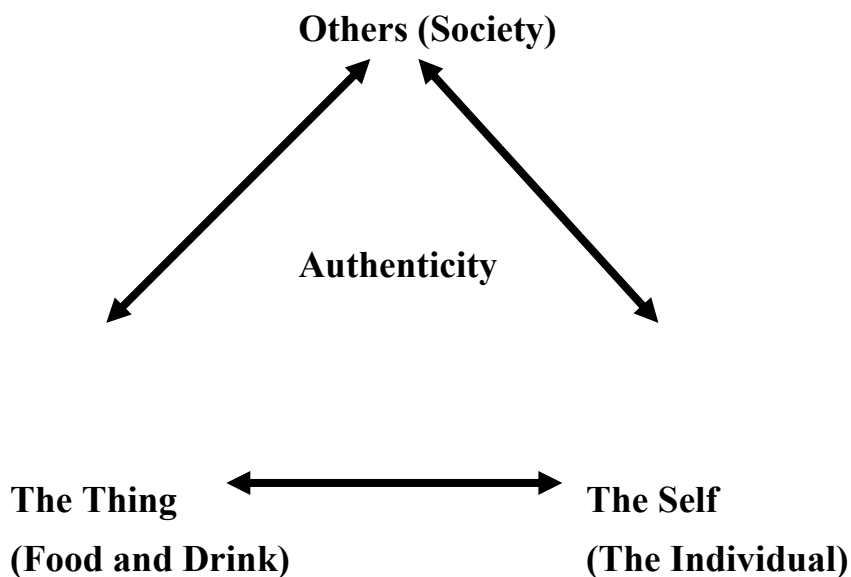
*“Part of our mission and core culture is to support local agriculture. But we don't have a strict definition of local – that is up to our customers. We give them the name of the product and where it is from so they can make their own decisions. From my perspective there are degrees of local – produce sourced from Britain is more local than produce sourced from Italy or Spain.” (Ibid)*

Definitions are not always simple. In addition the criteria for many of these awards and competitions are not transparent, though increasingly criteria are being developed, though, in my experience they are more likely to be passed on to the assessors rather than the entrants.

### **Authentication**

I have previously written about the process of authentication<sup>1</sup>, arguing that the defining of authenticity, or the authentication of some thing such as food, was a dynamic process dependent on an interaction between society (others), food (the thing) and the individual (self). This is illustrated in Figure 1 below.

**Figure 1. Model characterizing the nature of the relationships that define authenticity.<sup>1</sup>**



The appointment of judges and the process of judging would seem to represent a similar process, and could be considered to be a quest for some form of authenticity. As indicated authenticity is defined by a series of relationships and as such represents an ever-changing process based on these relationships; their dynamics and balance.

The individuals/judges have ideas about what they considered to be the appropriate criteria that would make producers or foods exemplars for the organization to which they belong or seek association with. These ideas have been formed as a result of the judge's interaction with food and society in general and specific foods and the specific society -in this case the organization and its members- over a period of time. The pattern of this interaction is variable. Society in general influences the outlook of individuals as a result of the relationship between society and the individual. At the same time specific subsets of society, the organizations, seek to influence individuals in terms of their attitudes towards food, the organization and also the broader context of the society within which we live. In order for somebody to be chosen as a judge and to continue to assess there must be some sort of balance, some sort of equilibrium between all components, that all are satisfied with. The rules that govern this dynamic are sometimes implicit and sometimes explicit. When I first started to judge for awards of this type often there were no rules at all, no criteria and no guidelines. It is interesting to see that, over time, advice has become more explicit with developing sets of criteria being used. Also when I first started to judge I was simply asked. I do not know why I was chosen, on

whose recommendation. Because I continue to be asked and continue to accept I presume that all parties are happy with the nature of the relationship that exists. Possibly the general public would not expect awards schemes of this type to be underpinned by such a vague process.

### Conclusions

When an individual is awarded first prize or a gold medal there is, quite reasonably, an expectation that that organizational product is ‘the best.’ Possibly the best of all those judged or the best of all, period. In many cases the actual process of judging is one that is highly subjective, based on the balance of a series of relationships between the organization, the individual judge and the varying views on the criteria that should be used in order to measure excellence. Indeed, in practical terms, it is probably very difficult to be highly objective. When this is coupled with the fact that many individuals enter themselves for these competitions it indicates that possibly consumers should approach such awards with this context in mind.

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**SECTION 8 – FOOD AND INSTITUTIONS**

## **Food satisfaction evaluation of Portuguese nursing home users**

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**Keywords:** food satisfaction, elderly, malnutrition, satisfaction with food-related life

### **Abstract**

**Introduction:** Dissatisfaction with food service can be one of several causes of the frequent malnutrition in institutionalized or dependent but still residing at home elderly.

**Objectives:** The leading aim of this work is to evaluate food satisfaction of nursing home users, in order to define strategies to improve the food service.

**Population and methods:** A cross sectional study was performed and the convenience sample included 45 users of the institution. A structured questionnaire was developed according to the aims of the study and applied by a trained interviewer. The quantitative analysis was done using the Statistical Program for Social Sciences (SPSS) for Windows, 17.0.

**Results:** The “flavour of the foods” was pointed by 48% of the respondents as the most influential factor on their food choices, when having meals at home. Among the 51.1% of the users able to consult the menu, 73.9% does not have the habit of doing it. 82.2% of the respondents have no opportunity to choose the menu in the main meals and 81.1% of those would like to have that possibility. Although the majority of respondents (57.8%) were satisfied with meals served by the institution, many pertinent suggestions were given to improve the menu, the meals and the food service. The parameters that generated less satisfaction were the adequacy of the menu plan to the user’s preferences, the sensorial quality of the foods and meals and the variety of the menu plan.

**Discussion:** In order to improve food satisfaction of this sample of users, it is crucial to increase the sensorial quality of the foods and meals served, increase the power and autonomy of the users, involve the users in the construction of the meals and increase the menu variety.

**Conclusion:** Despite the reduced sample size, the results show that evaluating the satisfaction regarding food service of this group of users is essential to

improving their wellness. Thus, the nursing home must include nutritional care in the medical and nursing routines.

## **Introduction**

The continuous aging of the population is one of the most notorious aspects of the recent demographic evolution in Portugal. According to the latest census<sup>1</sup>, conducted in 2001, the percentage of the population aged 65 years and older is 16.4%. Thus, there is inevitably a growing demand for institutions that provide formal care for the elderly. The increase of social response equipments for elderly people is proof of this demand<sup>2</sup>. Malnutrition is common among institutionalized elders<sup>3</sup> but also among those still living in the community<sup>4</sup>. Some causes of malnutrition may be the responsibility of the institution that provides the meals to the elder<sup>5,6,7</sup>. Therefore, the periodic assessment of food satisfaction must be of interest to all institutions providing food service to elders, especially in order to improve such service.

## **Population and methods**

The convenience sample includes 45 users, representing approximately 34.6% of the users of the institution, located in Coimbra, Portugal. The inclusion criteria were as follows: the patient must be at least 60 years old, have lived in the institution or received its services for at least one month and possess the ability to express himself or herself verbally, proving temporal and spatial orientation. Most of the data was collected in a direct interview (with a duration of, approximately, 60 minutes), guided by a questionnaire pre-tested in a small sample of respondents. In general, the questionnaire included questions that collected socio-demographic data, such as age and educational level, and which evaluated attitudes related to health and food choice. A scale to measure satisfaction with food-related life was also included alongside various questions aimed to evaluate interviewee's satisfaction with the menu plan, the meals and the food service. Some of the questions were based on previously conducted studies<sup>8,9,10,11,12,13</sup>. The quantitative analysis of the data collected was made using the Statistical Program for Social Sciences (SPSS) for Windows, 17.0. Descriptive analysis was performed and, in addition, correlations between some ordinals variables were tested using a Spearman's correlation test.

## **Results**

The sample constituted 45 elders, 25 (55.6%) institutionalized and 20 (44.4%) non-institutionalized. The latter group included elders that received lunch and an

afternoon snack, either in the institution or at home, and ate the other meals on their own. The average age was 80.2 years and 73.3% of the sample was female.

Smoking was the factor that respondents most considered to affect one's health (n=9, 20%), followed by support of family and friends (n=8, 17.8%), alcoholic beverages consumed (n=7, 15.6%) and eating habits (n=6, 13.3%). Four respondents (8.9%) answered the following "other" factors: "the salt", "the age", "the loneliness" and "the successive sorrows in life".

Among the respondents that still ate meals at home, 48% (n=12) pointed out the "flavour of the foods" as the factor that most influenced their food choices, followed by "eating healthy" referred by 24% (n=6). About meals taken in the institution, 84.4% (n=38) of the respondents answered that "Other person chooses the majority of foods I eat".

In relation to respondents' meals patterns, all had, at least, three meals per day, and 53.3% (n=24) usually had four meals. The average number of meals taken by the institutionalized users was higher than non-institutionalized, and the average number of meals taken by consumers of meals on wheels was the lowest. Among the 25 institutionalized users, only two (8%) ate all six meals the institution offers, with the midmorning snack and supper taken less often.

75.6% of the sample believed they need to eat according to their clinical condition: "because one wants to preserve his or her health and feel good" (n=14, 41.2%), "to avoid getting worse because already has a health problem" (n=8, 23.5%) or "because there are many foods his or her body doesn't tolerate which makes him or her feel indisposed" (n=8, 23.5%). Four users (11.8%) think they need to eat because of their clinical status "to avoid becoming overweight or to lose some extra weight".

The majority of the sample agreed with the five sentences of the scale to measure the satisfaction with food-related life. A positive, from moderate ( $p \leq [0.5 : 0.75]$ ) to strong ( $p \leq [0.75 : 0.9]$ ), and statistically significant ( $p=0,00$ ) correlation was found between all the sentences of the scale, excluding the first one, "Foods and meals are positive elements in my life".

In relation to satisfaction with the menu, only 29 (64.4%) of the 45 users recognize the existence of a menu plan because it is not presented to the 16 users of the meals on wheels service. In addition, six users (13.3%) found it inaccessible. However, among the 51.1% of users (n=23) able to consult the menu, 73.9% (n=17) were not in the habit of doing so. 82.2% (n=37) of the respondents admit having no opportunity to choose the menu in the main meals and 81.1% (n=30) of those would like to have that possibility.

Although the majority ( $\geq 50\%$ ) of the respondents were satisfied with the menu evaluation items, many suggestions were given. Some of them are presented



here: “I would increase the letter size of the menu”, “I would always offer big amounts of various salads”, “I would display the menu in a place where those in wheelchairs’ could also consult it” and “I would let the users know the menu in advance”.

When confronted with the opportunity of suggesting foods or meals they miss or would like to eat more often, the respondents gave many ideas. Some of those suggestions are emphasized in the following: “food from Alentejo” and “traditional food from Mozambique”, which highlights the importance of creating a menu adapted not only to the seasons and festivities, but also to the consumers and their life story; “scrambled eggs, smoked meat products, ripened cheese”, foods that probably made part of the food pattern of the users until the admission in the institution; and finally “Many foods that not worth to say because I couldn’t eat them anyway”, which represents the challenge to all dieticians and nutritionists of protecting and preserving health, while, allowing the patient to still have pleasure with food.

Although the majority ( $\geq 50\%$ ) of the respondents were satisfied with almost all the meals and foods, many suggestions were specified: “During meals, I would serve first the users that don’t muck up the food because the food already arrives dirty to the users served last”; “I wouldn’t sit close to the other users, those that act impolitely and with no hygiene while eating”; “I would take notes of which foods each user dislikes or cannot eat so then those foods wouldn’t be served”; “I would keep the employees in the same floor so they know the users much better and care about them”; “I would make the employees care about the amount of food each user eats so no one is fed too little” and “I would treat every customer equally”.

The three parameters in which more users were not much or not at all satisfied were: the adequacy of the menu plan to the user’s preferences (n=20, 44.5%); the sensorial quality of the foods and meals (n=20, 44.5%) and the variety of the menu plan (n=19, 42.2%). The parameters in which a percentage of at least 50% of the respondents really satisfied were: the amount of food served (n=35, 77.8%); the way staff looks (n=35, 77.8%) and the sufficient time to have the meals (n=17, 58.6%).

## **Discussion**

Among the 130 users of the institution, just 45 (34.6%) satisfied all the requirements to integrate the sample, especially because most of them could not express themselves verbally. This small sample size, in addition to the demographic homogeneity of the sample, did not permit consistent conclusions. Thus, instead of paying attention to the values of satisfied or unsatisfied users, in this study, the answers to the open questions and spontaneous comments from

the respondents during the interview will be the focus of discussion because they generated the most interesting results. Thus, it is probable that a questionnaire with fewer categorical questions and more qualitative analysis would have permitted more attractive and useful results.

Even if motivated, some respondents showed real difficulty in understanding the meaning of some questions. This complexity was obvious especially when confronted with the sentence “With regard to food, the conditions of my life are excellent” with which the users had to agree or disagree, according to the five point scale. Also in the scale, it was obvious that the majority of the respondents misunderstood the meaning of the first sentence, “Food and meals are positive elements in my life”, and that is probably the reason why no correlation was found between this and the other sentences of the scale. Almost all the respondents agreed with the sentence because “without food nobody can live”. However, the scale had already been validated in a European study, which included Portugal<sup>12</sup>. In any case, this emphasizes that one must be cautious when designing a questionnaire for a group of adults with an average age of 80.2 years.

In this study, it would also have been interesting to ask the users about the reasons why they usually do not consult the menu, about the reasons why they usually do not have all the meals; about the reasons why they think they do not need to feed themselves in accordance to their clinical status. It would also have been really interesting to ask the respondents about their appetite, because some said, spontaneously, that “the problem is appetite”.

In order to answer the most important goal of this study, it is crucial to present the strategies that might help the institution improve the food satisfaction of its customers. Fifteen respondents suggested the addition of more herbs and spices to the unappetizing food and 44.4% of the users are not much or not at all satisfied with the flavour and the smell of the food. The lack of appetite, largely determined by the sensorial quality of food, is the main cause of malnutrition in long term nursing homes<sup>14</sup>, so it is fundamentally important to increase the sensorial quality of the foods and meals served by the institution.

84.4% of the respondents said that, inside the institution, somebody else chooses most of the foods they eat. The loss of authority to decide one’s own food choices can lead to a decrease in autonomy and, therefore, of the self-esteem of the elder<sup>15</sup>. For that reason, it is imperative to increase the power and autonomy of the users.

According to the fact that 44.5% of the respondents are not much or not at all satisfied with the adequacy of the menus to their food preferences, and that 55.6% would like to join the creation of the menus, involving the users in the construction of the meals, asking them to suggest their favourite foods, can

increase the satisfaction of the users with food service<sup>16,17</sup>. This also shows the patients that their opinion does matter to the institution<sup>16</sup>.

42.2% of the respondents were not much or not at all satisfied with the variety of the menu and seven customers suggested increasing its variety to improve it. Moreover, 81.1% of the 82.2% respondents that declare having no chance to choose the menu on the main meals would like to have that opportunity. In fact, the monotony of menus and meals and the restriction of food choices can decrease food consumption and, therefore, increase the risk of malnutrition<sup>7</sup>. As a result, increasing the menu variety and offering more than one meal at lunch and dinner, can be a key strategy to improve these elders' quality of life.

## Conclusion

The reduced sample size did not forbid us to achieve the goals of this study. The food satisfaction of the institution users was evaluated and, based in the results, four main strategies the institution should follow in order to improve the food service in general have been defined.

In addition to these strategies, this nursing home, in order to have more satisfied clients, has to include the nutritional care in its medical and nursing routines, making them priorities due to their contribution to the wellness of the users. Consequently, these elders will be more satisfied with food, better nourished and, ultimately, more satisfied with their lives.

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## **40 days of free school meals as a tool for introducing market based healthy school meal systems in 35 Danish schools**

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**Keywords: school meal systems, implementation, user involvement**

### **Abstract**

When approaching school meal systems different concepts can be guiding the design of the food preparation and serving activities. This paper presents a government planned intervention concept of “40 days of free school meals”. The argument behind this intervention was to kick-start the implementation of healthy school meal systems in Danish schools. This paper argues that the initiative (in reality) invited the establishment of a service system concept, which dominated the initiative and led to a lack of involvement of important key players needed in the health promotion.

The method used for data collection was semi-structured, qualitative interviews. The main results from a systematic examination of the 35 participating schools show that the systems were mainly organized with external suppliers, and only a few of the 35 schools succeeded in establishing a user-paid school meal system afterwards.

The conclusion of this evaluation is that the established meal systems contained a lack of embedding factors, which is pointed to as one of the main challenges to a user-financed school meal system. The experiences of these 35 participating schools show that a period of free school meals is not a sustainable tool for achieving the goal of establishing new, healthy and user-paid school meals.

### **Introduction**

This paper presents the analysis of an initiative implemented by the Danish government in 2008, which had the official ultimate goal of helping promote healthy eating habits among children and young people<sup>1</sup>. In order to understand the context and the cultural background behind the introduction of a supported experimental scheme it is important to mention that Denmark has no tradition of

free school meals, as we see in other Scandinavian countries such as Sweden and Finland. A “lunch-bag-culture” is dominant in Danish schools<sup>2,3</sup>. This also means that canteen facilities are rare in Danish schools in general, and eating lunch often takes place in the classrooms.

The basic element in the experimental scheme was that Danish schools could obtain financial support in the form of payment for 40 days free school meals for all pupils as a tool to kick-start a new healthy school meal system. The financial support did not cover expenditure for kitchen renovation, wages etc. The schools themselves had the freedom to choose what type of meal-system they wanted to set up and at what time of the year. To receive support, the schools had to meet a series of demands, including having a food and meal-policy<sup>1</sup>. The new meal systems were implemented in 2008 at all participating schools.

The results from the research project shows a clear tendency at the schools to choose one type of system for introducing school meals. This system is termed by Holm as a liberal service project<sup>4</sup> characterized as an external system offering a food service to the pupils and a limited involvement at the schools. At the same time the government initiative underlines the health promotion as the primary purpose of the free school meals. This type of system is in Brinck, Kristensen and Hansen<sup>5</sup> termed as a health project and is characterized by a focus towards healthy food and healthy lifestyle and involves teachers, pupils and management at the schools. The discrepancy between the actual system and the wanted system are discussed in this paper.

### **Methods**

The data collecting method is based on semi-structured qualitative interviews with headmasters in the 35 participating schools, supplemented with interviews with 5 suppliers of school meals and 4 responsible administrations in selected municipalities. Interviews were conducted by phone and took place in the months from March to June 2009.

The analysis is based on implementation theory<sup>6,7</sup> and the construction of a “program theory”<sup>8,9</sup> serving the purpose of identifying the visions of the political initiative. The combination of visions and actual experiences gives a unique picture of the process and reveals some challenges and weaknesses in the experimental scheme.

### **Results**

The results of the interviews showed that almost all the schools had decided to implement virtually the same kind of school meal system, namely meals delivered by an external supplier on the day (26 commercial suppliers, 6

municipality kitchen suppliers, 1 hospital kitchen as supplier). Only 2 schools chose a meal-system where the meals were produced in a kitchen at the school. The almost unambiguous result questions whether the design of the scheme had some implications on what kind of system it was possible to establish.

Looking at the design of the experimental scheme and practice at the participating schools, several indicators showed that the meal systems were established in top-managed processes with headmasters as initiators and managers of the meal system and generally with a low involvement of other actors and a small degree of shared responsibility. Very few schools organized teams that had responsibility for the meal system. At the most successful schools, the headmaster had involved pupils, elderly volunteers or the supplier at the school in practical tasks concerning the school meals. The low involvement of other actors was explained by 1) time pressure, 2) lack of resources / skills in schools and 3) lack of tradition of working with “food” at schools.

Concerning barriers and challenges according to the implementation tool of “40 days of free school meals” five main issues were found: User share, price level, lack of diversity in the types of meals, inflexibility in ordering and paying for meals and lack of supportive materials or networking-activities for the schools and suppliers.

## **Discussion**

Our results suggest that the very low level of involvement of stakeholders in the process is a factor that explains why so few schools were successful in establishing user-paid school meal systems. According to Winter<sup>6</sup> and Vedung<sup>7</sup> the understanding of key-actors, and their ability and willingness to implement a new system, is crucial to the progress of the implementation. Characteristic of the experimental scheme was the fact that the suppliers and headmasters at the participating schools basically did not involve pupils, parents or teachers as key-actors neither in the preparation nor in the implementation process or gave them any influence. Only a few schools included key-actors in practical tasks relating to the school meals.

Another aspect of the design of the experimental scheme was the argument that it was introduced in order to ensure a healthy school meal. In the implementation phase the system rather seemed to be a service system where the schools were only involved to a limited extent and where some of the suppliers did not feel they had enough support in making healthy and tasty food. This may raise the question of whether the scheme was not thought through in relation to the overall aim of a healthy food system, or if the scheme was rather a deliberate service project selling itself as a health project without unfolding the necessary

steps towards ensuring the healthiness of the food and a healthy outcome at the schools in general.

## Conclusion

One of the key findings of our study was that only about half of the systems still existed 6-9 months after the free food period. Furthermore, among these it was only a minority who turned out to be organizationally anchored. The most successful schools were those involving pupils or other key-actors in the practical tasks in the meal system.

The implementation tool of “40 days of free school meals” turned out to have a number of barriers and challenges for both the suppliers and the schools. Our study showed that this tool creates one type of systems, which involves larger, external suppliers, as it requires great flexibility from the supplier. The explanation for the lack of diversity in the types of meals, according to the study, has to do with the design of the experimental scheme. The experimental scheme did not support the building or renovation of kitchens in schools, and left no competences or skills at the schools. The concept did not contain any network-building or other kinds of experience sharing. User involvement was generally absent in the concept.

The lack of involvement is to some extent explained by the fact that the need of creating economic surplus for the supplier will be the major goal of a school meal system with an external supplier. This agenda seemed to overrule the health project agenda in the participating schools. The question to be raised on the basis of the results is whether this will be the case as long as the school meal system is not an integrated part of the school’s education activities.

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## **Meal quality characterization served at a Portuguese hospital**

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**Keywords: foodservice, qualitative evaluation of meals, acceptance**

### **Abstract**

This study intended to evaluate the provision and distribution of meals in a hospital with regard to food safety, quality, amount per capita and acceptance by patients. A total of 40 meals were evaluated. There are no protected mealtimes; soup and desert were the primary components which were not according to the menu; transport inadequacy was due to poor containers; temperatures were often inadequate; portion sizes were inadequate for most of the meals evaluated; the main source of protein was red meat; carbohydrate was rice; the supply of legumes and vegetables was very low; the major cooking methods were stewed and fried; the supply of cooked fruit was excessive and the variety of fruit was reduced; meal presentation was satisfactory and acceptance of meals was considered good in general. The Food Service needs important improvements considering the non-conformities found. It is important to increase the variety, the amount per capita and supply of vegetables and legumes. It is considered necessary to monitor regularly the quality of meals and their acceptability by patients.

### **Introduction**

Hospital Food Service must provide food and nutritional support to patients, supplying balanced meals, nutritional counselling and food education<sup>1</sup>. An inadequate food service is responsible for the aggravation of patients' nutritional status during hospitalization<sup>2</sup>. Patients' dissatisfaction about food service increases the risk of malnutrition<sup>3</sup>. Evaluation of quality of meals and acceptance by patients are fairly relevant to monitor the quality of food service. The challenges faced by Hospital Food Services are enormous, aiming to satisfy a large number of patients with widely diverse food and nutritional needs<sup>4</sup>. The legislation regarding hygiene and food safety has become increasingly demanding in the last few years, ensuring that patients get safe and high quality meals. Hospitals and Hospital Centers have been progressively leasing Food

Services to specialized catering companies<sup>5</sup>. The purpose of this study was to characterize sensory, safety and adequacy of meals served at a Hospital Center in the north of Portugal which has a private catering company responsible for the Food Service.

### **Material and methods**

A total of 40 meals of regular Diet were evaluated, 10 lunches and 10 dinners in each ward. To collect the information a Check List was produced. Time of meals' arrival and beginning were registered. Food containers were checked in terms of damages and presence of physical contaminants. The temperatures of soup and dish components were assessed immediately after arrival and opening of containers, using a food thermometer (ETI ® 810-270). The temperature of each hot component of the dish was separately measured. The accordance between the planned and served menu was verified. Meal presentation was subjectively assessed, taking into account the appearance and odor. Fruit was also evaluated by degree of ripeness. Acceptance of meals was evaluated for each component of the meal. To determine the level of acceptance the following limits were established: "Bad" level- rejection of by >50% of the patients, the "Reasonable" level - rejection by > 25% and ≤ 50%, the "Good" level- rejection by > 10% and ≤ 25% and the "Very Good" level - rejection by ≤ 10% of the patients. It was considered rejection when the patient ingested less than half of the soup, the dish or the dessert.

To evaluate the adequacy of portion size, three weights of each dish and dessert were performed, using a SECA ® balance with a capacity of 2 kg ± 2 grams. As many components as possible were separated for a more accurate evaluation. The average of the three weightings was calculated. Considering the patients average age of 40 years and all male gender, the daily energy requirements were considered at 2200 kcal<sup>6</sup>. According to the World Health Organization recommendations<sup>7</sup>, the energy distribution of macronutrients should be 15% protein, 25% fat and 60% carbohydrates<sup>8</sup>. The percentage of total daily needs for lunch and dinner ranged between 30 and 34%<sup>9</sup> corresponding to energetic values between 660 and 748kcal. The conversion of the energetic values into servings is shown at Table 1.

**Table 1. Conversion of the energy into servings**

Energy (kcal)	Servings				
	Fruit	Vegetables	Cereals, cereals products, tubers, legumes	Meat, fish, eggs	Fat
660	1,5	2	5	2	2
748	1,5	2	6	2,5	2

The servings of fruit, cereals, cereal products, tubers and/or legumes and meat, fish and/or eggs were converted into weights. The edible weight of each fruit providing 15g of carbohydrates was calculated. For cereals, cereal products the yield was taking into account<sup>10</sup>. For legumes the cooking index of 2.0 was used<sup>11</sup>. The cooking method refers to the protein source or the entire dish. The presence of legumes, vegetables and salad and the variety were evaluated by observation, for soup the consistency was also evaluated. The type of dessert was also evaluated using a Check List with the following options: raw fruit, baked fruit, canned fruit, yogurt, homemade type dessert and ready to use dessert. Statistical analysis was performed using SPSS, version 17.0; means and frequencies were calculated for all parameters.

## Results and discussion

The intended meal delivery time was never accomplished during the study period, with an average delay of about  $15 \pm 7$  minutes. Delay of meals has direct implications on the welfare of these patients, since they have psychiatric disorders, showing impatience, causing instability in the ward; additionally the mealtimes are programmed in order to avoid more than 4 hours of fasting<sup>12</sup>. A study conducted at an Italian hospital with food service also leased out to a catering company also reported non compliance with the schedule in 39% of the meals<sup>13</sup>. The beginning of the meal occurred on average  $14 \pm 4$  minutes after the arrival of the containers, which corresponds to the time of plating. Plating occurred faster when more employees were available for its completion.

The planned menu was effectively served for 95.0% of the dishes, 70.0% of the soups and 67.5% of the desserts. The failure of the soups menu was due to an absence of specified legumes. This fact is probably related to poor kitchen planning, which could be avoided, for example, by using canned legumes. The dessert menu did not match the planned menu on 32.5% of the meals, due to the replacement of fruit for baked fruit. Similar data were obtained in a study conducted at an Italian hospital, where the menu was not followed in 8.3% of the meals<sup>13</sup>.

parameters evaluated revealed no damage to the food containers and absence of physical contaminants. However in 82.5% of the evaluations the isolation of the containers was inadequate: liquid foods, such as soup and dishes with sauce, easily poured from the container. The meals were transported in metal containers without a rubber seal, not allowing the proper transport of food. It is recommended that the catering company should replace them with insulated containers<sup>14</sup>. The low temperatures of meat, fish and/or eggs are critical; although optimal temperature for bacterial growth is around 37°C, the proliferation may occur at temperatures between 5 and 65°C<sup>15</sup>. The inadequate temperatures observed may be due to low temperatures of placing foods into containers, to a prolonged transport or plating or to inefficient insulation. Only 10.0% of the soups had three or more types of vegetables, and on the majority of the evaluations, the soup had only one type of vegetable<sup>16</sup>. Furthermore, the variety of vegetables was scarce: the only vegetables used were French garlic, onions, cabbage, turnip greens, turnips, carrots and cauliflower. Soup is an excellent source of fibre, vitamins, minerals and water<sup>17,18,19</sup>. In 20.0% of the meals, the soup consistency was too watery, demonstrating a lack of vegetables.

The only legume found in soup was bean, present in only two of the 40 soups evaluated and it was blended. Legumes are essential in soups with a suggested frequency of two to three times per week with several varieties offered, such as chick-peas, beans and lentils<sup>16</sup>. Legumes are good sources of carbohydrates, proteins, minerals, B vitamins and fibre<sup>18,19</sup>. The most common cooking methods were stewed (47.5%) and fried (35.5%); boiled and grilled were never used during the study period. The high temperatures of frying along with the presence of air, humidity and the use of metal containers may lead to thermal and oxidative degradation of oil and the formation of health detrimental compounds, which is worrying, since foods absorb most of the frying oil<sup>20,21</sup>. Frying should be restricted to a maximum of 10% of the meals<sup>22</sup>.

Nearly half of the meals included red meat (47.5%) as a protein source, poultry was served only at 12.5% of the meals. According to the World Cancer Research Fund Report of 2007<sup>23</sup> red meat increases the risk of colon cancer; and it has been associated with other types of cancer<sup>24</sup>, cardiovascular diseases<sup>25</sup> and type 2 diabetes<sup>26</sup>. The supply of poultry should be higher than that of red meat<sup>27</sup>. A study on a cohort of half a million people aged between 50 and 71 years, related red meat with an increased risk of mortality and poultry with a modest reduction in mortality<sup>28</sup>. Similar data were found in another hospital study<sup>29</sup>. Fatty fish was served only at 7.5% of the meals. Due to the richness in omega 3 fatty acids<sup>18,19</sup>, regular consumption has been associated with reduced incidence and death from cardiovascular disease, coronary heart disease and atherosclerosis<sup>30,31</sup>. The mainly carbohydrates source was rice, in more than half of the meals (55.0%), followed by potatoes (40.0%) and pasta (17.5%). The

supply of these foods should be more balanced<sup>22,27</sup>. Legumes were only served in 12.5% of the meals. According to recommendations, the supply and variety of legumes should be higher<sup>19,22,27</sup>. Raw vegetables were served only at 17.5% of the meals and cooked vegetables at 42.5%. The raw vegetables used were only lettuce and tomato and only 10.0% of the meals had three or more types of vegetables. The quantity and variety of vegetables should be higher, given their high nutritional density and low energy density<sup>19</sup> and role in the prevention of cancer, cardiovascular diseases<sup>32</sup>, hypertension and atherosclerosis<sup>33</sup>. Raw fruit was the most frequent dessert, served at 72.5% of the meals. However, the variety was restricted to orange/tangerine, banana, pear, kiwi and apple. Baked fruit was served in 17.5% of the meals. The cooking process may cause dissolution of water-soluble nutrients and oxidation or destruction due to heat<sup>19</sup>. Seasonal fruits should be used and a higher variety should be offered, taking into account differences between varieties<sup>10</sup>. The ready-to-use desserts were served in three meals comprising of gelatine.

Protein sources were insufficient in 50% of the meals. Carbohydrate sources were insufficient in 67.5% of the meals. It is important to adjust the quantities of meat and cereals and respective equivalents to patients' needs, since reduced intake may cause malnutrition and weight loss<sup>34</sup>. Fruit portions were insufficient in 65% of the meals. It is important to increase the amount of fruit to meet recommendations of 5 portions of fruit or veg<sup>35</sup>. Other hospital studies have revealed portion sizes served which have not met the catering service legal contract<sup>29</sup>. Transported meals are sensitive to deterioration on appearance, texture and flavour<sup>36</sup>. "Bad" and "Reasonable" acceptance was correlated to the dishes with an unsatisfactory presentation (Table 2).

**Table 2. Evaluation of presentation and acceptance of meal components**

<b>Component</b>	<b>Presentation</b>	<b>%</b>	<b>Acceptance</b>	<b>%</b>
<b>Soup</b>	Unsatisfactory	2,5	Bad	0,0
			Reasonable	5,0
	Satisfactory	97,5	Good	45,0
			Very Good	50,0
<b>Dish</b>	Unsatisfactory	15,0	Bad	5,0
			Reasonable	10,0
	Satisfactory	85,0	Good	47,5
			Very Good	37,5
<b>Desert</b>	Unsatisfactory	15,0	Bad	7,5
			Reasonable	7,5
	Satisfactory	85,0	Good	47,5
			Very Good	37,5

### **Conclusions**

The Food Service of this Hospital Centre needs substantial improvements, since the number of non conformities found was significant. The concession of the Food Service to a specialized company with no legal contract and without regular monitoring has negative implications on the quality of the service. There was special concern with the meal presentation as it greatly influences acceptance, notwithstanding the high level of satisfaction demonstrated in this study

It is important to establish regular monitoring of meal quality and of the safety of its transportation. Periodic evaluations developed by a nutritionist or a specialized technician focusing on the degree of satisfaction with meals and service, are necessary to maximize meals acceptance, contributing to better nutritional status.

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**SECTION 9 – PERSPECTIVES ON FOODSERVICE  
WORKERS**

## **Applying the socioecological model to understand the eating habits of restaurant chefs**

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**Keywords: socioecological model, chefs, eating habits, surveys, participant observations**

This is an ongoing, and a follow-up investigation (Phase 2) to corroborate and complement findings generated from a recently completed Phase 1 research<sup>1</sup>. Definitive findings from this study will be available by the conference date.

### **Abstract**

**Objective:** Using the socioecological model as a guiding framework, this study is seeking to examine the impact of *individual* (knowledge, attitudes, beliefs, and personality traits), *interpersonal* (social support from family, friends, and peers), and *organizational* (rules, regulation, policies, and informal structures) factors on the eating habits of restaurant chefs.

**Methods:** Data will be collected using a combination of qualitative and quantitative methods. Member chefs (n=300) from reputable culinary and related conference organizations will be recruited to complete a brief online survey aimed at gathering information on their eating habits, and the factors influencing them. Additionally, in order to help provide a context for the survey data, an observational tool will be used to describe the organizational structures and processes within a group of full-service restaurants (n=12) located in northern New Jersey, and New York City.

**Findings:** It is expected that factors such as nutrition- and health-related misconceptions, lack of social support from friends and family, and chaotic working environments will negatively impact the eating habits of the study participants.

**Implications:** Working in the restaurant industry has been shown to result in coping responses that may put chefs at an increased risk for obesity and related health problems. Experts have called for more empirical research assessing the

impact of socioecological barriers on the food behaviours of foodservice workers and chefs. Data generated from this study will be used to develop an intervention aimed at helping this population overcome these barriers, and make better food choices for an improved health and nutritional status.

## **Introduction**

According to the National Restaurant Association<sup>2</sup>, the number of meals consumed away from home has doubled in the last two decades. The increased frequency of eating out, availability of larger portion sizes, as well as the poor quality of food served have all been implicated in the rising toll of adult and childhood obesity rates in the U.S.<sup>3,4,5,6</sup>. Despite the link between eating out and obesity rates, there continues to be a growing demand for restaurant food. Professional chefs have now become celebrity personas due to their increased exposure in cooking-related television shows and segments. However, information on how this group negotiates its own dietary habits in an environment that does not easily accommodate healthy dietary and exercise habits are lacking. For instance, chefs have more hands-on and easier access to food compared to any other occupational group. Therefore, the higher proportion of energy intake that comes from eating out may be substantially more for them<sup>7</sup>. Nutrition knowledge has been shown to be a key component in an individual's continuing effort to change their eating habits and to seek out healthy food choices<sup>8</sup>. Professional chefs are increasingly being looked upon as role models that can significantly help control energy intake in restaurant settings by sharing their knowledge, creativity, and passion for preparing and consuming healthy food<sup>9</sup>. But recent surveys show that many chefs had misleading perceptions of the proper amounts to serve and eat: most believed that the oversized portions they served were within recommended serving sizes<sup>10</sup>.

In addition to easier access and availability of unhealthy foods, occupational factors have also been implicated as possible contributing factors to poor health among food service workers in general. For example, the prevailing structure and organizational culture in restaurant settings is described as "harsh", "difficult" or "demanding"<sup>11</sup>. Feelings of burnout as well as unhealthy dietary and lifestyle behaviours such as skipping meals, not exercising, smoking excessively, and drinking frequently are found to be rampant among restaurant chefs in particular<sup>12,13</sup>. In a recent study by German researchers, chefs were at a higher risk of cardiovascular disease due to irregular working hours, erratic mealtimes as well as the consumption of foods rich in fat, and overall higher energy intake compared to office workers<sup>14</sup>. There are a number of reports on the internet with claims of overeating and overweight among restaurant chefs. Unfortunately however, scientific data on the prevalence of overweight and

obesity in this population is lacking. Translational research examining the factors contributing to overeating, overweight, and related health problems among them is lacking.

Emerging evidence suggests that understanding the needs of underserved and at-risk populations from a socio-ecological perspective is essential to improving their health outcomes in the long term<sup>15</sup>. The socioecological model (SEM) has long been recognized as a comprehensive approach to health promotion because it integrates multiple levels (*individual, interpersonal, organizational, community, and policy*) of influence<sup>16</sup>. Unfortunately, while several studies have suggested that working in the restaurant industry result in coping mechanisms that may put chefs at a greater risk for obesity and related health problems, there is little published data examining the impact of eating on the job under all the aforementioned conditions. A situational analysis of the contextual factors that influence the eating habits of restaurant chefs while at work is needed. Thus, using the socioecological model, and a formative methodology as a guiding framework, we designed a multi-phased study to address this science knowledge gap. In Phase 1, we conducted qualitative interviews, and 24-hour dietary recalls with a small group of restaurant chefs (n=12) to gather preliminary data on their dietary preferences and behaviours as they were linked to the SEM constructs. Data analysis revealed that reported behaviours such as skipping meals, substitution of foods rich in fats and sugar for fruits and vegetables, increased consumption of alcohol, and lack of exercise may have been influenced by a variety of *individual* factors (health- and nutrition-related misconceptions), *interpersonal* factors (lack of social support from colleagues, family, and friends), and *organizational* factors (rigid rules and perceived norms associated with their profession)<sup>1</sup>. However, in order to design an intervention that is tailored to meet the needs of this population, it is important to further determine the nature and direction of the relationship between these constructs and their eating habits. At present, and to the best of our knowledge, there is no quantitative measure tapping the socioecological influences on eating habits for restaurant chefs. Therefore, the present study (Phase 2) is devoted to linking the thematic data derived in Phase 1 to design and test instruments that can help measure how *individual, interpersonal, and organizational* factors independently and conjointly influence the eating habits of this population while at work. Data generated from this research may be critical in helping this population deal with dietary obstacles more effectively<sup>17</sup>.

## Methods

Two instruments are being utilized for this study: an online survey questionnaire, and an observational tool. The survey questionnaire will comprise of 45-50 items reflecting the *individual, interpersonal, and organizational*

themes captured by the qualitative data in Phase 1. The responses will be arranged in a Likert-type format (*1 Strongly Disagree* to *5 Strongly Agree*). Examples of items under the *individual* construct are as follows: “*It is important to eliminate carbohydrates to lose weight*”; “*Fruit is unhealthy for you because it has too much sugar*”; and “*Meat is more nutritious than vegetarian foods.*” Examples of the *interpersonal* items are: “*Eating at work is a lonely experience*”; and “*At home, I eat complete meals with friends and family.*” Finally, items under the *organizational* construct include: “*There is a lot of stress in this job*”; and “*I have to adjust my eating habits to my work schedule.*” The survey will also include demographic questions, and collect data on their fruit and vegetable intake patterns. Examples of fruit and vegetable intake items are as follows: “*In the last month, how often did you eat fruit for your meals and snacks*”; and “*When you ate fruit for snacks, how many portions did you eat.*” A panel of culinary experts and consultants will review the instrument items for clarity, saturation of themes, format, and provide feedback for expanding items/themes when appropriate. After the expert and consultant review, the modified questionnaire will be pilot tested with a small group of 10-12 local chefs for face validity, and ease of responding. After piloting, the questionnaire will be further refined for internal consistency, item difficulty, and concurrent validity. The final instrument will be administered online to approximately 300 restaurant chefs via websites maintained by major culinary organizations including GigaChef, Restaurant Business Magazine, and the New York Restaurant Association.

The observational tool has been developed from the literature<sup>18</sup>, and based on themes targeted in the quantitative instrument. The purpose of conducting participant observations is to describe the organizational structures and processes that play a role in influencing the daily eating habits of restaurant chefs. Therefore, the observations may be valuable in providing a context for the survey data. A group of 12 chefs recruited from full-service restaurants located in northern New Jersey and New York City will be observed at work for periods ranging from 10-12 hours. A researcher will observe and take field notes on various dimensions including the types of activities taking place in the kitchen, the individual(s) managing the kitchen, the noise and level of chaos in the kitchen at the time of observation, etc. In addition, bites, tastes, or anything ingested by the chef will be time-stamped with estimates of their portion size. The observer will also take notes on the level and type of interactions the chef has with the rest of his staff, and other such routines and variables that provide further insight into his or her daily and typical working environment.

The survey data will be analyzed using descriptive and correlational statistics. Means, standard deviations, and percentages when appropriate will be computed for all survey items when relevant representing the individual, interpersonal, and

organizational factors. This data will be combined with descriptive statistics for the demographic and dietary intake variables. Correlational analyses will also be performed to test relationships between the individual, interpersonal, and organizational factors, dietary intake and demographic indicators. Fieldnotes from the participant observations will be transcribed, and represented in a thematic format to illuminate the organizational structures that may play a role in influencing the chefs' daily eating habits while at work. Findings from the observations will also be compared to the survey data to see if gaps exist between how the chefs report their activities, and their actual practices.

## Conclusions

Restaurant chefs may be at a greater risk for obesity, and poor nutritional health due to a variety of factors including health and nutrition-related misconceptions, stressful work conditions, excessive workload, gruelling job schedule (overtime, hours, shifts, varied schedules), long hours spent away from home, and lack of social support from family and friends. Unfortunately however, information on the factors contributing to overeating, overweight, and related health problems among them is lacking. We hope that the findings of this research could present suggestions for program planners to develop effective nutrition interventions that will improve the overall health of this underserved population.

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## **Job satisfaction in a food service chain of restaurants**

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**Keywords: job satisfaction, food service, Portugal**

### **Abstract**

Job satisfaction is believed to affect labor market behavior and influence work productivity, work effort, employee absenteeism and staff turnover.

The purpose of this study is to evaluate job satisfaction and socio-demographic characteristics of a population of food service employees from a Typical Portuguese Food chain of restaurants. In order to achieve this purpose we used an adaptation to Portuguese of the Overall Job Satisfaction Scale developed by Warr, Cook and Wall.

Overall we concluded that employees working in this food service company are satisfied with their jobs. We found that like satisfaction with your immediate boss, satisfaction with the opportunities to use your abilities and satisfaction with your fellow workers are the ones that relate more to socio-demographic and restaurant variables and therefore should be taken into account by food service managers.

Surprisingly sales was the variable with greater impact in the job satisfaction questionnaire, employees working in restaurants with higher sales state higher levels of overall satisfaction. Looking at our results from a different point of view we see that time in the food service area and function within the restaurant are the two social-demographic variables with greater impact on all other variables included on the job satisfaction questionnaire.

### **Background**

Many experts believe that job satisfaction trends can affect labor market behavior and influence work productivity, employee absenteeism and staff turnover. Moreover job satisfaction is considered a strong predictor of overall individual well-being, as well as a good predictor of intentions or decisions of employees to leave a job<sup>1</sup>.

There are innumerable definitions for the concept of job satisfaction; it is possible, however, to categorize them according to different perspectives<sup>2</sup>. According to Locke, satisfaction is an emotional response: “*Job Satisfaction may be defined as a pleasurable or positive emotional state resulting from the appraisal of one’s job or job experiences*”<sup>3</sup>. According to Spector, job satisfaction is simply how people feel about their jobs and different aspects of their jobs. It is the extent to which people like (satisfaction) or dislike (dissatisfaction) their jobs<sup>4</sup>. The results of Judge et al.’s study suggest that job satisfaction and life satisfaction are positively and reciprocally related. Life satisfaction significantly influences job satisfaction, and job satisfaction significantly influences life satisfaction<sup>5</sup>. There are not many studies done in Portugal in the area of job satisfaction and it is nearly impossible to find any related to food service. The studies about job satisfaction found were either based on data from the International Social Survey Program or from the European Community Household Panel and neither addressed the food service industry directly.

The aim of this study is to evaluate job satisfaction and socio-demographic characteristics of a population of food service employees from a Typical Portuguese Food chain of restaurants. The chain of restaurants whose employees were interviewed serves “home-cooked meals” in a shopping center setting.

## **Methodology**

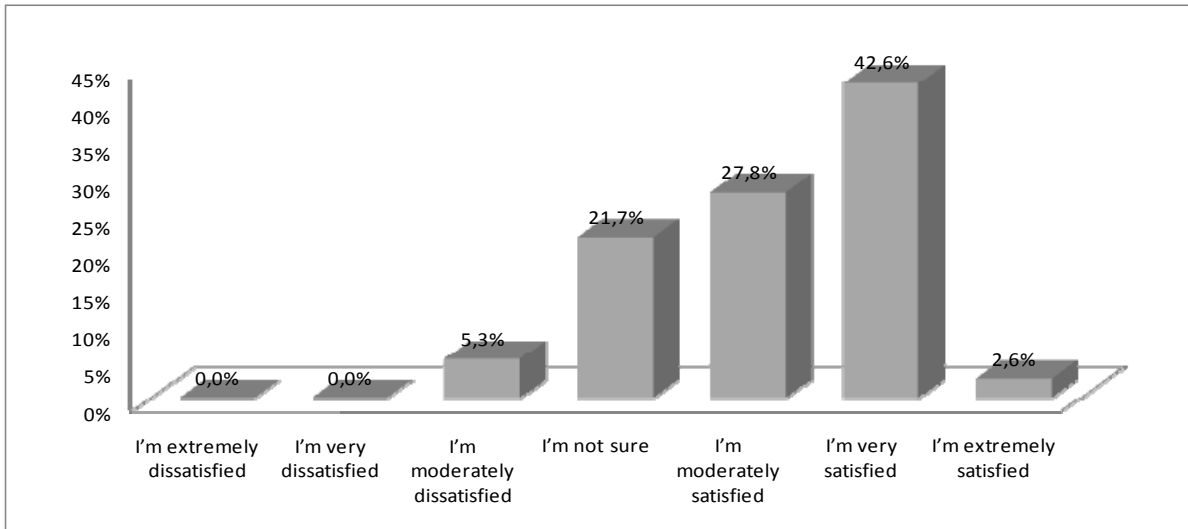
In this study we gathered information from 12 restaurants belonging to a chain of Typical Portuguese Food restaurants. Each employee from each restaurant was requested to answer a questionnaire divided in two parts. The first part of the questionnaire related to personal characteristics and to their work in the restaurant. The second part of the questionnaire was a translation to Portuguese of the Scale of *Overall Job Satisfaction* by Warr, Cook and Wall. This questionnaire consists of a series of 15 statements about which each employee had to state his / her own satisfaction. The scale of satisfaction presented went from 1 to 7, 1 being Extremely Dissatisfied and 7 being Extremely Satisfied<sup>6</sup>. The information was gathered in all restaurants in the same month (November). In the end, we had 119 questionnaires from 12 different restaurants situated in the center and south of Portugal.

## **Results**

According to the author, in order to find a value, an estimation should be done to find overall job satisfaction, adding all levels of satisfaction and dividing them by 15<sup>6</sup>. The average overall satisfaction level was 5,14 (with a minimum of 2,6

and a maximum of 6,9 on a scale of 1 to 7). 73% of the employees claim to be moderately satisfied or satisfied or very satisfied with their jobs (See Figure 1).

**Figure 1. Overall job satisfaction (calculation)**

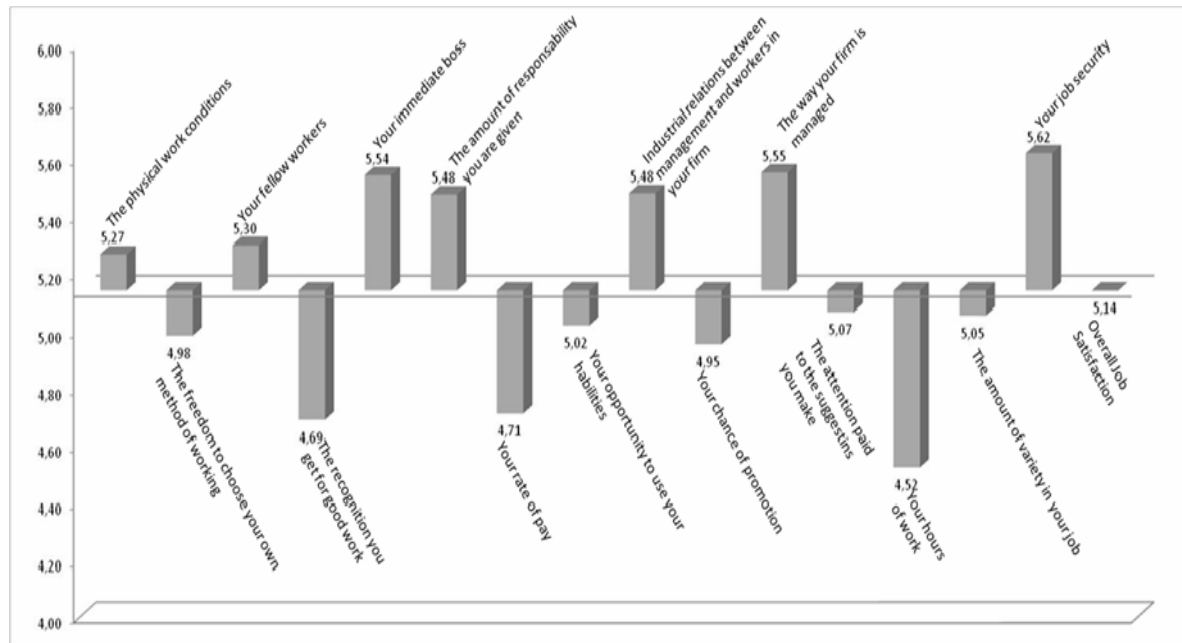


Although for all the 15 questions in our job satisfaction questionnaire the average was within the moderately satisfied category, we can observe differences: “Your hours of work” as the lowest average and along with other seven items of the questionnaire has lower averages than the Overall Job Satisfaction Calculation. On the other hand “Your job security” has the highest average of the 15 items, six other items have higher averages than the Overall Job Satisfaction Calculation as we can see in Figure 2.

Job satisfaction is correlated with sales ( $\rho=0,281$ ,  $p=0,002$ ): overall job satisfaction levels are higher in restaurants with higher levels of sales. Employees working in restaurants in the south of Portugal have lower level of overall job satisfaction.

In order to achieve our goal of understanding if satisfaction / dissatisfaction with particular Items of the Scale are related to particular socio-demographic characteristics, we related the various variables. We found that only four of the Job Satisfaction Questionnaire Items (satisfaction with your immediate boss, with the amount of responsibility you are given, with your rate of pay and with your opportunity to use your abilities) were related to socio-demographic characteristics.

**Figure 2. Average of the 15 items compared the overall job satisfaction average**



The item “Your immediate boss” correlates with the time employees take to get to work, this correlation, although very weak ( $\rho=-0,212$ ,  $p=0,028$ ), tells us that employees who take more time to get to work are less satisfied with their immediate boss (Table 1).

This item also relates to the area of work in the restaurant and the mean of transportation that employees use to get to work. Employees working in the service area are more satisfied with “Your immediate boss”, while employees working in the kitchen have higher levels of dissatisfaction. Those using public transportation are less satisfied with their immediate boss (Table 1).

**Table 1. Relationship between “your immediate boss” and area of work, means of transportation and time to get to work**

		"Your immediate boss"														p
		I'm extremely dissatisfied		I'm very dissatisfied		I'm moderately dissatisfied		I'm not sure		I'm moderately satisfied		I'm very satisfied		I'm extremely satisfied		
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Area of Work	Kitchen	1	2,1	4	8,3	4	8,3	4	8,3	9	18,8	18	37,5	8	16,7	0,034
	Service Area	1	1,9	0	0,0	0	0,0	4	7,4	8	14,8	25	46,3	16	29,6	
	Both	0	0,0	0	0,0	0	0,0	1	20,0	1	20,0	2	40,0	1	20,0	
Means of Transportation	On foot	0	0,0	0	0,0	1	6,3	1	6,3	3	18,8	6	37,5	5	31,3	0,013
	Public Transportation	3	3,0	3	4,5	3	4,5	7	10,4	12	17,9	29	43,3	11	16,4	
	Car	0	0,0	0	0,0	0	0,0	1	4,3	3	13,0	10	43,5	9	39,1	
Time to get to Work		ρ=-0,281														0,002

The second item that relates to socio-demographic variables is “The amount of responsibility you are given”: differences were found between functions in the restaurant and according to the means of transportation used to get to work.

Kitchen’s helpers are the ones who stated being more dissatisfied, while mess boys and managers were all satisfied. Regarding means of transportation we found that only employees using public transportation are extremely dissatisfied with the responsibility they are given, while of those getting to work by car 96% are satisfied (Table 2).

**Table 2. Relationship between “the amount of responsibility you are given” and area of work and means of transportation**

		"The amount of responsibility you are given"														p
		I'm extremely dissatisfied		I'm very dissatisfied		I'm moderately dissatisfied		I'm not sure		I'm moderately satisfied		I'm very satisfied		I'm extremely satisfied		
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Function	Cook	0	0,0	1	1,0	0	0,0	1	6,3	2	12,5	10	62,5	2	12,5	0,021
	Kitchen's Helper	0	0,0	1	1,0	2	9,5	5	23,8	5	23,8	7	33,3	1	4,8	
	Mess Boy	0	0,0	0	0,0	0	0,0	2	20,0	0	0,0	8	80,0	0	0,0	
	Waiter	1	2,3	0	0,0	1	2,3	4	9,3	11	25,6	22	51,2	4	9,3	
	Management	0	0,0	0	0,0	0	0,0	1	5,9	2	11,8	10	58,8	4	23,5	
Means of Transportation	On foot	0	0,0	0	0,0	1	5,9	1	5,9	4	23,5	10	58,8	1	5,9	0,013
	Public Transportation	1	1,5	1	1,5	2	3,1	12	18,2	11	16,7	36	54,5	3	4,5	
	Car	0	0,0	1	4,0	0	0,0	0	0,0	4	16,0	13	52,0	7	28,0	

The third item that relates to socio-demographic variables is “Your rate of pay”, correlates with the amount of time that employees take to get to work. This correlation, although very weak ( $\rho=-0,189$ ,  $p=0,044$ ), tells us that employees with lower salaries take longer to get to work.

“Your opportunity to use your abilities”, relates to age, time of work in food service and having a degree in food service (Table 3).

Its correlation with age, although very weak ( $\rho=-0,238$ ,  $p=0,013$ ), tells us that older employees are less satisfied with this item. When it comes to time off work in the food service industry, this very weak correlation ( $\rho=-0,206$ ,  $p=0,034$ ) tells us that the longer employees have been working in the food service industry the less they are satisfied with the opportunity to use their abilities (Table 3).

Besides correlating to age and time of work in the food service industry, “Your opportunity to use your abilities” also relates with having a degree in food service. A higher percentage of employees with a degree in food service state that they are extremely dissatisfied with their opportunity to use their abilities (Table 3).

**Table 3. Relationship between “your opportunity to use your abilities” and degree in food service, age and time working in the food service industry**

		"Your opportunity to use your abilities"														p
		I'm extremely dissatisfied		I'm very dissatisfied		I'm moderately dissatisfied		I'm not sure		I'm moderately satisfied		I'm very satisfied		I'm extremely satisfied		
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Degree in Food Service	Yes	3	13,0	0	0,0	1	4,3	6	26,1	8	34,8	4	17,4	1	4,4	0,010
	No	1	1,2	6	7,0	6	7,0	9	10,6	13	15,3	41	48,3	9	10,6	
Age		$\rho=-0,238$														0,013
Time Working in the Food Service Industry		$\rho=-0,206$														0,034

When comparing the 15 items of the Job Satisfaction Scale with restaurant variables such as sales, higher sales correlate with higher levels of satisfaction on six job satisfaction questionnaire items. Employees in restaurants with higher sales are more satisfied with their fellow workers ( $\rho=0,270$ ,  $p=0,005$ ), with the recognition they get for good work ( $\rho=0,298$ ,  $p=0,002$ ), with their immediate boss ( $\rho=0,288$ ,  $p=0,003$ ), with the industrial relations between management and workers in their firm ( $\rho=0,330$ ,  $p<0,001$ ), with their chance of promotion ( $\rho=0,214$ ,  $p=0,028$ ) and with the way the firm is managed ( $\rho=0,328$ ,  $p=0,001$ ).

## Discussion

Overall most of the people that answered the questionnaire are satisfied (73%) with their job. These results are similar to those found by Sousa-Pouza in 2000, in his study about Portugal<sup>7</sup>. In his study 71,4% of the individuals were satisfied with their job.

Although for all the 15 questions in our job satisfaction questionnaire there were always more individuals classifying themselves in the satisfied part of the scale, the percentages of satisfaction varied between questions even if never significantly. It is clear that some employees are less satisfied about particular aspects of their job, and these are the item presenting a lower average. The item with lower satisfaction average is “Your hours of work”, followed by “The recognition you get for good work” and lastly “Your rate of pay”. These results lead us to believe that salary may not be the most important factor of satisfaction. This is consistent with the fact that we did not find any relations between salary and job satisfaction items. These results are unlike other that of other studies, which showed a direct link between job satisfaction and wages<sup>8,9,10</sup>. On the opposite side of the scale we find the top three satisfaction items: “Your job security”, “The way your firm is managed” and “Your immediate boss”. These three items are particularly interesting considering the economic crisis that Portugal is undergoing.

Relating overall job satisfaction, with all variables we found that it only relates significantly with two: sales and location. Employees working in restaurants with higher sales are overall more satisfied. This is not a relation easy to explain, but it may be due mainly to differences in income, since restaurants with higher sales give higher productivity prizes to its employees.

Overall job satisfaction only relates significantly with sales and location. Employees working in restaurants with higher sales are overall more satisfied. A study in Portugal showed that job satisfaction is related with different regions, Lisbon and the Tagus Valley area reporting the lowest level of satisfaction<sup>10</sup>. In our study we found different results: the least satisfied employees are in the south of Portugal, while the most satisfied ones are in the center of Portugal and in the Tagus’ south coast line.

Rate of pay is related with time to get to work: employees who take longer to get to work are less satisfied with this item. This is a correlation quite difficult to explain which makes us wonder if it is not mediated by another variable. One hypothesis for this mediator factor are prizes: our study showed that employees who take more time to get to work receive fewer prizes and even though not significantly our study shows a positive correlation between prizes and satisfaction with rate of pay.



## Conclusion

Most people in the world have to work in order to survive; therefore job satisfaction and happiness must be connected<sup>11</sup>.

Our goal with this study was to evaluate the job satisfaction of food service employees and relate it with other characteristics both at a personnel and organizational level. Surprisingly, sales was the variable with greater impact in job satisfaction: employees working in restaurants with higher sales state higher levels of overall satisfaction and higher levels of satisfaction on six of the job satisfaction questionnaire items.

When it comes to overall job satisfaction our results are consistent with others in the literature<sup>7,10</sup> showing that, overall, people are satisfied with their jobs. Taking a closer look at individual items from the Job Satisfaction Scale we concluded that employees are more satisfied with some: “Your immediate boss”, “The amount of responsibility you are given”, “The way your firm is managed” and “Your job security”, and less satisfied with others: “The recognition you get for good work”, “Your hours of work” and “Your rate of pay”. The fact that the number of hours worked and salary are some of the aspects with lower satisfaction rates is not surprising, as the food service business has extended schedules and usually pays poorly.

Although we do not consider that the results of this study can be translated for the entire Portuguese food service population we consider that they are important and should be taken in consideration in developing similar studies in Portugal.

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**SECTION 10 – FOOD AND EDUCATION**

## **The emancipation of food and beverage provision from the traditional model: UWIC's approach**

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**Keywords: food and beverage operations, funding of practical areas, new models**

### **Abstract**

This paper highlights the dilemma facing UWIC, specifically regarding hospitality programmes when moving to a new building. The financial constraints placed on Universities forced the hospitality team to justify the costs associated with operational food and beverage provision. Unless a radical new approach was found, no provision would be available. This paper evaluates the funding paradox, the perceived need for operational competence, the practitioner staff and some examples of innovative approaches by other Universities. Using a case study, the researcher uses an auto-ethnographic approach with participant observations. The hospitality team has reflected on the process and their experiences working with management and the architects to find a cost effective solution to meet the needs of UWIC and the students. The new facility opened in September 2010.

### **Introduction**

The Cardiff School of Management UWIC has recently invested in a £20,000,000 new build on the existing Llandaff campus. This literature review highlights the many problems associated with hospitality operational training, the rationale for providing in house training and examples of new approaches by other institutions. UWIC has recently opened a new facility and this paper examines the process, the justification and the experiences encountered.

### **Background**

*“Practical training differentiates the subject from mainstream business and management courses, and is central to the culture of a hospitality management school”<sup>1</sup>*. The vast majority of food and beverage practicals are delivered ‘in house’ in restaurants and food production kitchens. Inevitably, with the costs in

terms of space, equipment, academic staff, technical staff costs and the relatively small class sizes, they are constantly under review. A study estimates that 64% of laboratory work is in food and beverage management<sup>2</sup>. A second study looked at thirty four institutions and found food and beverage practical sessions to be core in all but one institution. Twenty six courses included practical sessions at level one and two, with seventeen courses delivering at level one only<sup>3</sup>. Over 50% of the academics surveyed stated plans to make significant changes during the next two or three years, which highlights the problems balancing the importance of the subject area against the finances. Five key issues were identified<sup>3</sup>:

- Funding/Standards paradox
- Operational competences at the ‘core’ of hospitality programmes
- Attracts ‘less academic’ but industry literate students
- Tendency to recruit practitioners/non research active staff
- Infancy of models/theoretical underpinning

### **Funding/standards paradox**

The funding of operational areas has been problematic for many years: the HEFCE (1998) review was in part to highlight the increasing pressures on the cost of the practical resources and the threat to the quality of the provision. They expressed their concerns “*that a number of factors are gradually eroding this distinguishing feature of hospitality management courses*” and concluded there should be a “*baseline requirement of practical competence for entry into the industry*”<sup>2</sup>. This has not materialized, although the industry may well argue they recognize the institutions that prepare students with excellent industry specific and practical experience and prefer to take on employees from those institutions.

In the current UK economic and political climate, food and beverage practical training has a problem with costs and there is no easy solution. This is a challenge for all hospitality courses and some examples of how other universities are responding to change will be discussed.

### **Operational competence at the ‘core’ of hospitality programmes**

There is general agreement that operational competence is at the core of hospitality programmes<sup>2,4,5,6</sup> but there is limited research in the food and beverage subject area. Whilst it remains at the core of the subject, the need for

academics to share new and innovative approaches is essential. A framework suggested by Littlejohn<sup>2</sup> is that *'undergraduate level demands a complex mix of hard and soft skills be delivered to students that are underpinned by a strong theoretical foundation'*. If this could be achieved, the content, appropriateness and academic rigour would give the subject more credibility and respect. This will develop students who are adaptable, reflective with an appropriate awareness of the diverse and dynamic industry environment which is constantly changing.

### **Tendency to recruit practitioners/non research active staff**

The change of focus from the traditional emphasis on the production and service skills requires specialist skills and experience. This has not been addressed by many institutions. *'The principal issue around research and operations teaching is that staff in this area have traditionally been recruited from an operational background and therefore have no relevant academic experience'*<sup>6</sup>. Many of these staff are resistant to change and institutions have been slow to react. Often the training facilities will only be operational for twenty two weeks of the year, leaving technical staff and non research active staff on annual salaries without sufficient work loads. The staffing costs are unsustainable and new approaches are necessary to achieve cost effective and educationally relevant food and beverage teaching without losing the technical skills required by industry.

### **Infancy of models/theoretical underpinning**

The traditional model, serving classical table d'hôte menus to elderly customers, aptly called *'Purple rinses and pseudo-escofferian menus'*<sup>6</sup> is being phased out. A key reason has been the lack of resources to update and refurbish tired restaurant facilities, and the inability to justify this kind of facility in new builds. That is not to say food and beverage is no longer a core subject: in fact many institutions are very proud of their facilities and manage to operate within departmental budgets. There are a range of approaches to new builds, some finding sponsorship such as Oxford Brookes and Surrey and operating in a more commercial approach, whilst still retaining the quality standards required for the students. Another example of a successful operation is Sheffield Hallam, which rather than take the commercial route operate a facility where the kitchen is regularly used not just for kitchen production, but Health and Safety, Hygiene, product development, food technology, demonstrations, all housed in one unit. The restaurant is a flexible space, with excellent storage facilities to allow constant use of the space for conferences, meetings and seminar sessions. Birmingham has a thriving business model used by both FE and HE, including specialist Indian cooking facilities.

Another alternative suggestion is to use the students' existing work experience<sup>7</sup>: programme teams should consider introducing a Work Based Learning structure, which allows for both Industrial work Experience and Professional Development modules, thereby catering for the needs of a wide range of students and encouraging widening access and participation.

The increase of mature students with hospitality work experience is just one method which institutions are using to reduce the costs without reducing standards. Two innovative approaches to change in food and beverage delivery have been outlined by Dutton for Brighton University and Farbrother at Bournemouth University. They faced similar dilemmas in finding alternatives to the traditional training restaurants. Both schools independently looked at a variety of approaches to deliver operational modules, for similar reasons.

Brighton University, considered a similar model to Bournemouth, but with supported funding from HEFCE's Project Capital Round 3, they redeveloped and replaced their traditional kitchens and restaurants with a hospitality laboratory named the Centre for Social Interaction and Culinary Arts (CENISCA).

Bournemouth, after careful consideration chose a three pronged approach to be phased in over two years:

- Running the University's staff dining facilities;
- Enhancing the HAVE project to a compulsory status – this allows students to reflect on and learn from their part time paid employment in the sector;
- Operating a computer simulation exercise to support management decision-making<sup>8</sup>.

There appear to be a plethora of new approaches responding to the needs of modern universities to overcome the problems associated with food and beverage, and meet the needs of students, subject benchmarks and industry, despite the lack of funding.

### **Initial UWIC model**

The literature review offers a range of new approaches to the food and beverage provision. Once the decision was made to deliver in-house provision in the new build, the head of school was approached and asked if a member of the hospitality team could be present at all the new build meetings. Once we had the support of the head of school, the opportunity to put forward proposals was possible. The first meeting was literally a blank piece of paper.

## **Methodology**

Since the author has been involved in the development and the rationale for the new approach, an autoethnographic stance was considered the most appropriate method. *'In autoethnography, then you use your own experiences to garner insights into the larger culture or subculture of which you are part'*<sup>9</sup>. A diary of events was kept and participants in the process were observed and interviewed. At the planning stage, observations were made of the planning committee, the architects, the views of staff, students and UWICs hospitality services team who will share ownership. The second phase of participant observation follows the views, opinions and perceptions of the stakeholders involved in the opening and running of the new hospitality suite.

### ***Primary data collection***

The author and the hospitality team have reflected on the design, ownership, costs, sponsorships, usage for academic and commercial purposes, the students' opinions and the planned future strategy. The initial findings are the results of the process and the key points that will assist any University in the UK or internationally, in achieving a suitable practical experience to meet with the financial constraints placed on Universities.

The aim of the hospitality team was to limit the amount of operational food and beverage provision to level one only, to underpin the theoretical academic knowledge. Students must develop as reflective practitioners and fully equipped for IWE at level two.

## **Findings**

### ***The planning process***

The hospitality team was very pro-active in having a, open mind to the type of facility as long as we could achieve our teaching aims. The prior preparation and planning was critical as we always talked about the benefits to the whole of UWIC and not simply a relatively small cohort of hospitality students. Another useful ally was the dramatic rise in Event Management students and the opportunity for them to arrange and organize events for up to three hundred people. Finally, the UWIC conference team will be able to sell the space for conferences, dinners and exhibitions etc. Teaching is completed in twenty four weeks, leaving twenty eight weeks to sell the venue for profit.



### ***Ownership***

The ownership of the facility needed to be a shared cost. Negotiations took place for the School to pay a proportion of the costs and maintenance. Technical staff would be a collective cost or hired specifically for teaching purposes only. The initial costs had to be estimated with a view to reviewing every three months in the first year.

### ***Sponsorship***

Sponsorship has been secured with two major hospitality suppliers in Wales.

### ***Usage for academic and commercial purposes***

The new facility offers the opportunity to deliver a range of service styles and food production methods to meet module descriptor requirements. The facility is being utilized one day a week for level one Events Management for practical hospitality, lighting, staging and events. Larger events can be catered for by opening glass partitions and expanding into the ground floor concourse, allowing for conferences and events up to three hundred people. A range of short courses such as Widening Access, Children's Cooking Academies and Healthy Eating programmes have taken place in the first term. Primarily the space is being used for meetings, with two 'state of the art' conference rooms, adjoining bar and reception area with separate entrance. The area can also be used as one ninety seater restaurant or two smaller dining areas. The commercial demand has been very encouraging, with customers including the Welsh Assembly, the NHS and the Welsh Labour Party. In many cases the whole new building is being hired and managed by Conference Services. The kitchen area is being used for operational training purposes and plans are in place to collaborate the School of applied science to share expertise and develop Knowledge Transfer Partnerships. Without the new hospitality suite, the hiring of the whole facility would be less attractive.

### ***Future strategy***

The projected turnover and costs for the first year are on target. Meetings will take place before the conference to discuss a longer term strategy.

### **Conclusion**

The new build was completed on time and opened in September 2010. The presentation will analyse and evaluate the trials, tribulations and successful

outcomes of the research up to Easter 2011. UWIC has chosen a very different approach to the teaching of operational practices, significantly reducing the costs to the Cardiff School of Management, embracing the needs and requirements for Events Management students and opening the facility for commercial usage all year. Any University investing in a new build will need to address the issues and the dilemmas faced by UWIC. Without careful planning and preparation, the financial costs will lead to the questioning of whether the hospitality programmes are justified. The paper is an opportunity to develop a broader contribution to knowledge in terms of academic management and course development by highlighting the need to deliver quality programmes that are cost effective.

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## **Meeting the demand for high calibre graduates for the hospitality industry in Nigeria – A dream or possibility?**

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**Keywords: education-industry, employable, career drive, esteemed careers, parents' events, endowment fund**

### **Abstract**

The Hospitality and Catering industry plays a vital economic role in the UK, ranked as the third largest with a workforce of over 2.5 million people. It is defined as the provider of all food and drink away from home with operating units both diverse and complex, with all outlets playing an important role in the UK economic and social climate<sup>1</sup>. It has never been more challenging and exciting than it is today such that everyone involved should be shouting from the roof tops to persuade young people to come and join this great industry<sup>2</sup>. It is thus encouraging to observe that the hospitality and catering industry in Nigeria is growing rapidly as a result of the need for the products it offers, to a national, regional and global market segment. Moreover, it is no surprise that operators in the hospitality and catering industry in Nigeria are consistently seeking trained, industry-employable graduates. Operators seek graduates who are innovative thinkers that have developed many transferable skills. Wavecrest College of Catering and Hospitality Management was used as a case study to unveil effort that has been made in the midst of various challenges that exists in the Nigerian environment to attract and train graduates, and to meet the demand for high calibre graduates for the hospitality industry in Nigeria. Strategies have been proposed to attract and develop employable graduates, for the industry. Several important points have been highlighted which should be addressed by both hospitality educators and the industry at large. The potential for growth observed to be the current case of this industry in Nigeria and Africa at large with lots of opportunities existing across the continent, which requires specialized and dedicated manpower. Implications are drawn for education and the industry as a whole.

## **Introduction**

The hospitality and catering industry plays a vital economic role in the UK, ranked as the third largest with a workforce of over 2.5 million people. It is defined as the provider of all food and drink away from home with operating units both diverse and complex, with all outlets playing an important role in the UK's economic and social climate<sup>1</sup>. It is thus encouraging to observe that the hospitality and catering industry in Nigeria is growing rapidly as a result of the need for the products it offers to national, regional and global market segments. Moreover, it is no surprise that operators in the hospitality and catering industry in Nigeria are consistently seeking trained, industry-employable graduates. Added to this, operators seek graduates who are innovative thinkers with good practical hands-on skills. The graduates they expect will have been educated to understand fundamental principles underlying foodservice operations and its management alongside possessing the appropriate attitude for a hospitality career. All these criteria are envisaged because it is a known fact that as hospitality and catering responds to regional demands rather than to national trends alone, so too does the demand for labour<sup>2</sup>.

The focus of this paper is to reveal how the Nigerian hospitality industry can attract, develop and sustain the right calibre of students by providing an attractive and challenging environment. In addition, to also show that the industry can only achieve this through the co-operation between existing operators, academia and other interested stakeholders. A prospect that could be achieved perhaps, if this is enhanced by them putting into consideration areas discussed in this paper, and more. Thus, this paper presents effort that has been made and areas that still need to be covered or explored. These are presented through unveiling the effort that has been made so far by a hospitality training Higher Institution, in Lagos, Nigeria known as Wavecrest College of Catering and Hospitality Management. There is a strategy to develop, employable graduates, for the industry and society at large. In the midst of challenges that exist in the Nigerian environment, this is the focus of the paper, so that it can also show that more stakeholders need to be involved for the industry to meet its target of employable graduates as noted to exist in other industries.

## **Methodology**

Data of students' admitted, along with that of students that have graduated, and data of past, current and future employers, graduate job request register, and career drives organized was assessed, from 2000- 2010. Interviews were conducted with 20 students of the college who have finished job placements. In addition, interviews were conducted with 3 students, present during this study, desiring to drop out, due to financial reasons. The list of graduated students for

2008 from Wavecrest College was also compared with the list of graduate students for 2008 of 5 highly esteemed careers that parents and guardians are known to compel students to chose, in place of a hospitality career (Engineering, Medicine, Accountancy, Law and Pharmacy). This list of graduates of esteemed careers was obtained from a randomly selected higher institution with similar criteria as Wavecrest. This was done to highlight a noted issue of concern. This to be specific is the existence of a growing number of ‘esteemed career’ graduates, which are increasing yearly, with many of them remaining unemployed. Most of these are graduates usually from the more than 30 plus Federal and State universities in Nigeria, all of which offer these stated ‘esteemed’ career paths. Each year each of these universities graduate similar numbers of ‘esteemed career’ graduates, which directly contributes to observed youth unemployment because many of them eventually are not absorbed into the career paths they have chosen. While this alarming trend exists, it is also noted that there exists an inadequate number of employable hospitality graduates. As the number of operators in Nigeria increases, employers’ demand for graduates from Wavecrest continues to remain high.

### **Results and discussion**

The results from comparing the list of ‘esteemed careers’ graduates, to that of graduates from hospitality in Wavecrest, shows that one question that stakeholders could be asked is “could effective career orientation be used as a means of intervention to attract some of these ‘esteemed career’ students so that they do not get into an unemployed state?” A state of unemployment may perhaps be prevented if they are given appropriate career orientation. Result from the data showed that the career drives that Wavecrest continues to use are an undisputed means to attract students, and increase employable graduates. The results have also revealed that it is crucial to create an endowment fund for students in the Nigerian environment, so that many students do not drop out of college due to lack of funds. Besides this, mentor development, job placement experiences, and training for career counsellors is also required for many cogent reasons, not discussed extensively here due to the limits of this paper. The results further indicated that communication with parents at perhaps parents/teacher events or meetings, and communication with members of the public are also crucial areas to focus upon. This is because it is necessary for the population to have the proper orientation about hospitality careers. Results further led to this paper presenting the view that there is a need to project hospitality as a career path that deserves esteem, by showcasing unknown attributes of a hospitality career and hospitality as a whole. This is because of the stigmas that exist generally, not only in Nigeria, about this career. The results also showed that there is a need to ensure that all stakeholders understand

the importance of education-industry partnership, career exhibitions and the continuous training of presently untrained members of the hospitality workforce. In all outlets around the country, the organisation of youth career media panels, for example that can influence career choices, and generate better attitudes towards it, need to be part of the larger effort. Besides this, the results also showed that since the time Wavecrest started its Hospitality Diploma programmes, as the first Monotechnic institution in Nigeria, its graduate students have been in high demand by operators across the country. Thus, all these factors indicate that more effort needs to be made by all concerned to attract, develop and sustain employable graduates.

### **Conclusion**

Without any doubt, this study revealed that Wavecrest is saliently developing desirable graduates, even though the demand for developed employable graduates is yet to be significantly met. For various cogent reasons, the image of the industry, recorded numbers of drop outs, a lack of endowment funds for students that require financial support, were all identified as challenges. Added to these findings is the belief that education has a stake in contributing to that “transition from classroom to workplace”<sup>3</sup>. The need for the industry on its part to engage educators in constructive ways to expose students to the nature of work and influence them to remain in the industry was also recognized<sup>4</sup>. It is also useful to highlight the potential for growth of this industry in Nigeria and Africa at large, with lots of opportunity existing across the continent, which requires specialized and dedicated manpower<sup>5</sup>. But then, a concluding view is that there needs to be an ‘awakening’ in the mind of all stakeholders about the role that positive, sparingly tapped and influential critical factors can play in providing the required understanding about hospitality careers. More specifically, they need to appreciate the underlying fundamental principles that drive hospitality and catering operations, its management, and the image of hospitality operations as a whole. This will help to attract, develop and sustain demands for employable graduates for the hospitality and catering industry in Nigeria. When all these issues are fully addressed, a steady pool of industry employable, graduates may become a possibility, not just a dream.

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**POSTERS**



## **Lycopene content of various watermelons in Greece (from organic or non organic cultivations)**

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Watermelons (*Citrullus lanatus L.*) are a rich source of substances with beneficial effect to human health. Among them lycopene is very important because it is a powerful antioxidant and an effective free radicals scavenger. Consumption of food rich in lycopene helps to retard cancer development and prevent cardiovascular diseases.

### **Aim**

In this work the lycopene content of watermelon varieties cultivated in organic and non organic cultivations in Greece was determined in order to be able to suggest to consumers which watermelons are more beneficial to health. Samples of different watermelon varieties from different areas in Greece were collected.

### **Method**

Lycopene was extracted from the flesh of the fruit and from its juice. Extraction and determination of lycopene were performed as described by Wayne W. Fish et al (2002)<sup>1</sup>. According to this method a mixture of hexane-ethanol-acetone-BHT is used as the extraction solvent and the absorption of lycopene is measured at 503nm using a spectrophotometer.

### **Results**

Lycopene content varied in the range of 3.5 to 7 mg/100g fresh weight. Lycopene content displayed statistically significant differences among the varieties and for the same variety among organic and non organic cultivations. Statistically significant differences among samples of different cultivation areas were also observed. Samples of the icebox type (Sugar Baby) displayed the highest average lycopene content among the investigated samples. No statistically significant differences were observed between the flesh of the watermelon and its juice.

### **Conclusion**

Watermelons cultivated in various areas of Greece have in general sufficient lycopene content indifferently from the variety or the cultivation area. Besides the variations in lycopene content among the varieties there are significant differences according to the area and the method of cultivation for each variety.

People can use indifferently either the fruit or its juice to benefit from lycopene antioxidant capacity and for having potential health results.

### **Reference**

1. Fish W., Perkins-Veazie P. and Collins J. A quantitative assay for lycopene that utilizes reduced volumes of organic solvents. *Journal of Food Composition and Analysis* 2002; 15: 309-317.

## **Adolescents' eating out habits in a semi-urban city of Portugal**

**Almeida V.<sup>1</sup>, Oliveira B.M.P.M.<sup>1,2</sup> and Rodrigues S.S.P.<sup>1,3</sup>**

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<sup>3</sup>*ISPUP, Universidade do Porto*

### **Introduction**

Modern lifestyles are characterized by a lack of time for everyday activities such as cooking, which lead to an increase of eating out of home. With the rising importance in overall food intake, eating out is often associated with less healthy eating habits and the risk of developing chronic degenerative diseases such as obesity. In adolescence, it is common to adopt unhealthy eating habits that can remain in adulthood. Assessing such dietary habits might help to better shape the development of strategies for conducting an early change by improving healthier eating out choices.

### **Aims**

To characterize adolescents' eating out habits.

### **Methods**

100 adolescents, aged 13 to 17 years old, from five public schools placed at Ílhavo (a semi-urban Portuguese city) were evaluated by a self-administered questionnaire. Based on the Hector Eating Out Questionnaire, habits such as frequency by meals, weekend importance, places of consumption and time changes were assessed.

### **Results**

The 51 girls and 49 boys involved had a mean age of 14.3 (sd=0.8) years.

Either every day or at least 2-4 times a week, a large number of the students had lunch, midmorning and afternoon breaks out of home, respectively 64%, 61% and 47%. Some students also referred the same high frequency of eating out (either every day or at least 2-4 times a week) for breakfast, dinner and supper, respectively 9.5%, 13% and 7%.

Breakfast and lunch has been referred to be consumed out mainly during the week (57% and 70%), while eating out dinner mostly occurred during weekends (67%).

In comparison with the previous year, the eating out frequency has reduced for 32% of respondents, and has increased for 26% of them. The reasons stated for

eating out less were mainly “more time available” and “health reasons”. In opposition, eating out more often was justified by “less available time/convenience”.

The places more referred for eating out occasions were: for breakfast – cafe/bar (37%), school/canteen (30%), bakery shops (22%); for lunches - school/canteen (43%), friends/family house (16%), take-away/home delivery (13%), fast-food restaurants (10%); for dinner – restaurants (28%), friends/family house (26%), fast-food restaurants (21%), take-away/home delivery (18%).

No significant statistical differences between girls and boys or among schools were found.

### **Conclusions**

The participating adolescents eat out quite often, mainly at lunch, midmorning and afternoon snacks but also to some extent at breakfast and dinner. The time available was the main reason stated for changes in eating out frequency. In addition, schools were an important place of out-of-home food consumption. Although more research is needed to assess the nutritional quality of eating out meals, the investment in school meals provides a great opportunity to widen the quality and variety of foods in adolescents’ eating out occasions.

## **Eating out in Portugal: An analysis of the food service system**

**Ávila H.A.M.<sup>1</sup> , Oliveira B.M.P.M.<sup>2</sup> and Rodrigues S.S.P.<sup>3</sup>**

<sup>1</sup>*Uniself, sa*, <sup>2</sup>*FCNAUP and LIAAD-INESC LA, Universidade do Porto*,

<sup>3</sup>*FCNAUP and ISPUP, Universidade do Porto*

### **Introduction**

Rapid social and economic changes have introduced relevant lifestyle adaptation and contributed to the globalization and increasing of eating out. The measures proposed to promote and sustain healthy eating habits should take into account both the food service and the consumers. The existing inconsistencies on the available data about the different Portuguese food operators do not easily allow systematic assessments or cross-sector analysis.

### **Aims**

To undertake a documental analysis about the food service system.

### **Methods**

A literature review was undertaken. The PubMed, Scopus, ISI and WoK databases and the search terms 'eating', 'eating out', 'out of home', 'eating behaviour' and 'restaurant' were used to look for articles published since 2000. The websites of reference organizations, institutions and corporate market research were also explored for the literature search.

### **Results**

What is meant by the 'food sector' and its main operator's changes considerably – as well as the applied terminology – depending on who does the analysis. The food service market moved in diverse directions: although they are different business sectors, consumers use, without distinction, the food supply and the food service – HoReCa – to purchase food and drinks to be consumed within and outside the home.

### **Conclusions**

The terminology used in foodservice is not uniform, a fact that hampers the characterization, research and data comparison about food service actors or eating out. In addition, the analysis and characterization of the food service social functions and the definition of measures corroborating governmental guidelines is difficult. Both the HoReCa and the supply sectors should be involved in implementing such measures.

## **To serve or not to serve? An exploration of the motivation and perception of staff working in food and beverage servicescapes**

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### **Aim**

This work in progress paper aims to better understand what constitutes the hospitable experience and how this knowledge can be utilised to develop and empower food and beverage staff to provide more natural, enjoyable and authentic hospitable experiences.

### **Methodology**

The pilot focus group was held at a four star hotel located in the outskirts of Cardiff. Hotels inevitably have a differing variety of food and beverage servicescapes within the one hotel, and often hotel food and beverage staff have to ‘multi-task’ and fluctuate between a variety of differing servicescapes. Interesting questions and comparisons can therefore be drawn between how staff adopt and act out roles, modes and the appropriate level of service for different servicescapes within one hotel.

### **Initial results**

- The majority of staff began working in the case study hotel due to the location and closeness of the hotel to their homes, rather than a genuine interest in hospitality.
- The staff who preferred working in a bar to a restaurant did so because they preferred the physical ‘barrier’ of the bar itself. Conversely, staff who preferred working in a restaurant preferred the proximity and closeness of the space between themselves and the customer.
- One member of staff commented that although they felt that they did have a degree of being ‘naturally nice’, they often lied to customers. This same member of staff also happens to be a proficient poker player with a ‘poker face’.
- All of the interviewees agreed that personality cannot be taught or trained.
- The promise of potential of increased tips did not proactively affect the level of service that the staff provided for customers.

- Those who wanted to stay in the industry all saw their futures as managers / owners of a business within the hospitality industry.
- All of the interviewees believed that they behave differently when they visit restaurants to friends/family/peer members who do not work in the industry.

### **Interpretation of results and future direction**

- Is being genuinely and authentically naturally hospitable ever achievable, and if so, can it actually be taught/trained?
- The link between flirting, sexuality, gender and service.
- The link between acting and tips and vice versa – to what extent does having a “poker face” help within the hospitality industry – the ethics of lying and acting?
- How does the behaviour of food and beverage staff differ in their role as customer from those customers who have no experience of working in the food and beverage industry?
- How do others view you / hospitality jobs *per se* and the impact of this upon their perception of work and “suitable work roles”?

## **Food safety risks in shared student refrigerators**

### **Hudson P.**

*Foodservice and Nutrition research Group, School of Tourism, Bournemouth University.*

### **Aim**

Previous research has identified the need to understand food safety behaviours as an adjunct to developing workable food safety communication strategies amongst many different population subgroups. Students are a particular group of interest. A key issue for students is the sharing of refrigerator space. Student accommodation is often provided with relatively small refrigerators designed for use in a more traditional domestic set-up (i.e. a single family-type unit). Anecdotal evidence suggested that students often divide refrigerator space by allocating each member of the 'household' a shelf on which to store all their refrigerated foods. This was considered likely to increase food safety risks and this study set out to investigate the potential food safety risks in shared student refrigerators.

### **Methods**

Students studying at undergraduate students at Bournemouth University were contacted via a large scale internet based questionnaire to examine food hygiene knowledge. In parallel, unannounced visits were made to student halls of residence and, with the occupants' permission, high quality digital photographs were taken of fridges in 65 student flats in two halls of residence housing mainly first year students. The images were then analysed for evidence of poor food storage practices.

### **Results**

Some 299 students responded to the survey within the time frame for data collection. The majority of students in all types of shared accommodation (82.9%) operated a 'shelf-each' approach to the allocation of refrigerator space. There was evidence that whilst the majority of respondents understood the mechanisms of cross-contamination, fewer were able to accurately describe procedures to minimise the risks. Amongst the 248 students living in households using the 'shelf-each' approach there was a recognition that this meant that the position of raw and cooked foods in the refrigerator depended more on who was storing them rather than good hygiene practice and that raw meat may be found anywhere including occasionally in the salad drawer or the door. These data were confirmed by analysis of the photographs although, overall, there was



relatively little raw meat present in the refrigerators photographed (present in 18.46% (12) of refrigerators in the sample).

### **Conclusions**

The education and engagement of the end user is undoubtedly critical to the ultimate success of any food safety strategy. Undergraduate students, many living away from home for the first time, have been shown to adopt risky food safety behaviours due to the perceived need to be able to account for their own food and limited available refrigerator space. In the short term, accommodation providers need to address refrigerator provision and provide students with more appropriate hygiene information. Longer term solutions may include more intelligent refrigerator design which recognises this type of use.

## **Nutritional and quality attributes of wheat buns enriched with the larvae of *Rhynchophorus phoenicis* F.**

### **Idolo I.**

*Department of Animal Science, Delta State University, Asaba Campus, Asaba, Delta State, Nigeria*

### **Aims**

The larva of *Rhynchophorus phoenicis* is one of the delicacies consumed by people in Southern Nigeria. Proximate analysis of the Larva found it to be nutritious containing appreciable amounts of essential amino acids, fat and other nutrient supplements. Since wheat based buns is a snack product containing mainly carbohydrate, this research work aimed at enriching the wheat buns by developing a process for incorporating the larva into processed wheat buns. In addition, nutritional and sensory evaluations were carried out on the developed wheat-larva buns to determine the suitability of the product.

### **Methods**

The process for enriching the wheat buns involved substitution of wheat flour with processed flour of the larva at 5%, 10% and 15%. The buns were processed by deep frying in oil at a temperature of 150<sup>0</sup>C for 12mins. The processed wheat-larva buns were analysed for energy, protein, calcium, magnesium, and zinc content. Furthermore, sensory evaluation was carried out by a semi-trained 20-member panel and the results analysed using SAS vs 9.2.

### **Results**

The results of the nutritional analysis of the buns showed increase in the protein, energy, Ca, Mg, and Zn content with progressive increase in the larva content. The sensory evaluation showed that no significant difference ( $p \geq 0.05$ ) were observed between the 0% and 5% substitution level in the sensory attributes of aroma and flavour, taste, texture and general acceptability. However differences were significant in the colour ( $p \leq 0.05$ ). The buns with 15% larva content was the least accepted in nearly all the quality attributes evaluated.

## **Conclusions**

The result shows that an acceptable, nutritional enhanced bun product can be processed with the inclusion of larva at 5% level. Furthermore, incorporating the larva into carbohydrate based foods commonly consumed by African countries would help to combat the problems of malnutrition and protein deficiency plaguing the continent.

## **The content of some constituents of dried plums beneficial to health (polyphenols, potassium, magnesium and calcium)**

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### **Aim**

In this study we focused on the determination of the total polyphenol, magnesium, potassium and calcium content in dried plums marketed in Northern Greece in order to estimate their effect on their food value. Samples were purchased from the food market of Thessaloniki.

### **Methods**

Total polyphenol content was determined by a spectrophotometric method using Folin-Ciocalteu reagent. Magnesium, potassium and calcium were analysed using an atomic absorption spectrophotometer. For the ash content determination, a muffle furnace was used.

### **Results**

Total polyphenol content in investigated dried plum samples ranged from 141 to 350 mg (expressed as gallic acid) /100g of sample. Samples without seeds were found to have lower total polyphenol content than the ones with seeds.

Magnesium content ranged between 32 and 54 mg/100g, while potassium content ranged from 617 to 1054 mg/100g of dried plum samples. Only small differences were observed among the dried plum samples, with respect to either magnesium or potassium concentration values. On the contrary, calcium content displayed considerable differences among dried plum samples, ranging from 23.4 to 114 mg/100g of sample.

Ash content ranged between 1.07 and 2.21% and it seems to depend on the calcium levels.

### **Conclusion**

The investigated samples displayed minor differences in their magnesium and potassium content but considerable differences in their total polyphenol and calcium content. Due to the observed differences, care must be paid to the right selection of dried plums for consumption, in order to maximize their potential beneficial effect on human health.

## **Cooking skills and learning sources in a sample of Portuguese adolescents**

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### **Aim**

To assess adolescents' cooking skills and learning sources.

### **Methods**

390 adolescents from the 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> grade in a school from a semi-urban region in northern Portugal were requested to fill in a questionnaire evaluating self-reported cooking skills. Among other issues, the questionnaire focused on the following aspects: Do you know how to cook? (Likert scale between 0 and 5); How did you learn how to cook? (choose from the list the most important learning source); Did you ever cook each of these 10 particular foods? (no, never; yes, with help; yes, all by my self); Would you like to learn how to cook better? (Likert scale between 0 and 5) and How would you like to better learn how to cook? (choose from the list the most important learning source).

### **Results**

Our sample had 55.1% of females and 44.9% of males, with a mean age of 13.5 years (sd=1.0). The person in charge of the adolescent was, in general, a parent that most frequently had an education level between 1 and 6 school years (64.3%).

Knowing how to cook was evaluated in a scale between 0-not at all and 5-very well. The selected answers were as follows: 0-9%, 1-10%, 2-19%, 3-38%, 4-19% and 5-5%, the mean value being 2.6 points (sd=1.3). Adolescents who did not know how to cook stated as the main reasons for that: having someone cooking for them (47%) and not liking/no interest (35%). Those who knew how to cook mainly stated family (88%) and by their own (8%) as learning sources.

The foods referred to be ever done "all by my self" for more that one third of the adolescents were eggs (61%), mousses (46%), rice (46%), potatoes (41%), cakes (41%), pasta (34%) and meat (32%). The highest proportion of respondents who had never cooked such food was found for vegetables (57%), fish (51%) and soup (49%). Girls stated more than males to had ever cooked for all type of foods ( $R \leq 0.002$ ). In general, those who cooked each food type, either with or without help, also referred more to enjoying that specific food. Liking to learn

how to cook better was assessed in a scale between 0-not at all and 5-very much. The answers were as follows: 0-7%, 1-3%, 2-5%, 3-17%, 4-20% and 5-48%, 3.8 points (sd=1.3) being the mean value. Those who would like to learn more, stated family/friends (82%) and culinary courses (10%) as the preferred learning sources.

### **Conclusions**

Almost one in each ten adolescents still does not know how to cook. Vegetables, fish and soup were found to be foods that nearly half of the adolescents had never cooked. Female adolescents were more involved in cooking than males. However, a good point was the huge proportion wanting to learn how to cook better. Following the idea that teaching cooking skills may have a positive impact in future food choices, this fact seems to be promising and encouraging for the promotion of cooking classes/courses at school, which in Portugal has very seldom been done. The importance given to family and friends in the transmission of such skills should not be forgotten and schools must involve and count on them to support such activities.

## **The role of public and private stakeholders for the promotion of wine tourism as an economic alternative: The case of Priorat (Catalonia, Spain)**

**Londoño M.P.L.**

*University of Barcelona*

The development of tourism and particularly public administration have had to adapt to new trends and the demands of the tourist market (Fayos-Solá, 2004) especially in Spain, thus generating some of the most remarkable and structural changes which constitute the emergence of new touristic dynamics (Lopez Palomeque and X. Font, 2010). In the Catalan territory, which has participated in those dynamics, wine tourism has become an alternative product within diversified touristic offerings, traditionally focused on sun-and-beach holidays. This trend has also been adopted elsewhere in Spain.

Since 2001, to revitalize the local development of a sparsely populated region that has historically based its economy on wine production, the Priorat region in the south of Catalonia (northern Spain) has been promoted as: “wine tourism,” an economic alternative through public and private effort and through the creation of a strategy for the “promotion and development of wine tourism in the Priorat region”. The Priorat's experience shows wine tourism not merely as a diversifying alternative to mass tourism, but also having the potential to display the local culture and natural heritage of an authentic area that can distinguish itself from highly competitive tourism brands such as the city of Barcelona.

This poster shows how and why public and private actions have emerged for the promotion of wine tourism as an economic alternative and diversification of tourism in this region, and the progression of these actions so far. The analysis was conducted using SWOT (Strengths, Weaknesses, Opportunities and Threats) methodology as the primary tool. In addition, the poster applies information drawn from interviews with public and private institutions who work in conjunction with wine tourism in this area such as rural hotels and wineries. Finally, the poster allows us to observe the current process and its future prospects as an alternative form of mass tourism.

## **Sanitary characterization of elementary school foodservices at a Portuguese municipality**

**Martins M. and Rocha A.**

*Faculty of Nutrition and Food Science, University of Porto, Portugal*

### **Aims**

In the last decades, important changes occurred in family lifestyles determining deep modifications of food patterns, characterized by an increase in the number of meals made away-from-home. This situation allowed the development of the foodservice industry, contributing to increasing of importance of school meals on children's daily food intake.

Food safety in school foodservices is a matter of concern since any incident may affect a high number of children. School meals must be not only nutritionally balanced but also guarantee safety.

The purpose of this study was to assess the current food-handling practices and hygienic-sanitary conditions of school foodservices in Public Elementary Schools.

### **Methods**

This survey was conducted between October and November 2010 at foodservices of Public elementary schools of a Portuguese Municipality.

The school foodservices studied were randomly selected. Researchers visited school foodservices and compared cooking school units that had central kitchens with school units that transported meals from centralized food units. It used a checklist to assess the hygienic conditions and practices used by the food handlers. The checklist was based on the System of Planning and Evaluation of School Meals. Food safety procedures were classified and valued into 9 or 12 factors for distribution Units and cooking Units respectively.

### **Results**

School food units with and without cooking steps were compared. 89 school foodservices were audited. Only one cooking unit was classified as non acceptable.

Cooking food units obtained higher scores than non cooking units. The most common non conformities found were too early preparation of meals and waiting at ambient temperatures, inadequate hygiene procedures and conservation of equipment, utensils and pavement, absence of utensils and



equipment protection, inadequate storage of chemical products and inadequate use and conservation of garbage containers, which may contribute to cross contamination.

Among positive food-handling practices identified were adequate cooking temperatures and effective control of meal temperatures, appropriate uniforms, proper food storage, separation of raw and cooked foods, inventory rotation and correct hand hygiene practices. 83% of school foodservice evaluated showed acceptable conditions that provide safe meals.

### **Conclusion**

Food handlers' practices at Public elementary schools evaluated were considered satisfactory. Periodical training of food handlers, physical restructuring of food units, improved working conditions and constant supervision by qualified professionals are necessary to improve quality and safety of school meals.

## **Job satisfaction of food handlers at a Portuguese foodservice university unit**

**Martins M. and Rocha A.**

*Faculty of Nutrition and Food Science, University of Porto, Portugal*

### **Aims**

University students experience significant environmental changes related to food by assuming responsibility for food purchasing and meals preparation, which usually has negative impacts on the quality of their diet. University Food units play an important role in eating habits and may help ensure appropriate nutrient intake.

A friendly working environment may significantly contribute to productivity, and to the general wellbeing of workers. Sanitary conditions at foodservices are important both for performance and quality of meals served.

The aim of this study was to assess satisfaction with working conditions of foodservice staff at a University foodservice in Portugal.

### **Methods**

A transversal study was conducted on May 2009 and involved all workers of the food unit. For data collection a self-administrated questionnaire was used, which included data about satisfaction with structural conditions of Unit, utensils and equipments available at the workplace, operating conditions, staff practices and conduct. Furthermore, food handlers' satisfaction with the variety of meals available and quality of food products was also assessed.

### **Results**

A total of 14 subjects participated. The majority of respondents were female (78,6%) with an average age of 37 years.

Concerning job satisfaction, the majority (57%) of food handlers considered themselves satisfied. Answers showed high motivation and performance of workers. Some reasons for dissatisfaction were work timetable schedule (29%). Some workers showed dissatisfaction with replacement of damaged equipment and with areas of cleaning utensils.

Regarding to menus variety, a low variety was reported, which could reduce meals acceptance by university students.

## **Conclusions**

This study has evidenced the need for improving the motivation of staff foodservice which may lead to a better performance and a higher quality of meals served. Nutritional programs and planning of adequate and diverse menus are essential to improving the quality of foodservice, possibly involving food workers in menu planning.

## **Food handlers' satisfaction with working conditions**

**Nunes H. and Rocha A.**

*Faculty of Food Science and Nutrition, University of Porto*

### **Aim**

The purpose of this study was to evaluate the satisfaction of foodhandlers with working conditions at a food service unit.

### **Methods**

To achieve this goal a socio-demographic characterization was developed and these data were related to working conditions and job satisfaction. A questionnaire including socio-demographic characteristics and a satisfaction scale based on Overall Job Satisfaction was applied for data collecting.

### **Results and discussion**

102 food handlers of Oporto University Canteens were inquired. Five of the eighteen food units evaluated were explored by a catering company.

The respondents were satisfied overall with their work and correlated activities, showing greater dissatisfaction with salary and promotion opportunities. The age, number of years working in the food service area and the cashier function were the demographic variables that mostly affected overall satisfaction.

Physical conditions of work, work performed, job stability, the immediate superior, the organization and operation of the food units and recognition of work by supervisors were the characteristics that showed more influence in predicting overall satisfaction

### **Conclusions**

According to our results we may conclude that it is not enough to analyze job satisfaction from a single item, as workers respond differently to different issues related to their work, depending on individual feelings and expectations.

## **Culinary arts and food sciences: A fresh education at Kristianstad University**

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### **Background – why a new gastronomy education in Sweden?**

In 2004, a new educational programme, Culinary Arts and Food Sciences, was launched at Kristianstad University. The expectations were elevated: a higher education in gastronomy in southern Sweden had been sought after for a long time. Seven years later, in spring 2011, five cohorts of students, approximately 100 people, have graduated as Bachelors of Social Science with the main subject being Food and Meal Science, also entitled Gastronomists.

### **Development of the programme 2004-2011**

The aim of the Culinary Arts and Food Sciences study programme is to meet future needs for innovations and product development within the food and meal sectors, including the food industry, restaurant and catering, grocer's shops, the event industry and the package industry. The catchwords of the programme are: "Food for many" and "Everyday gastronomy" implying knowledge and skills in the service of society.

Today, the study programme includes the main subject Food and Meal Science, and supplementary courses, which give an introduction to or deeper studies in relation to the main subject. Food and Meal Science includes, for example, consumer oriented sensory and product development, craftsmanship, culinary and balanced meals and meal aesthetics. From the fifth semester there is a possibility for individual specialisation within Culture and Communication of Food and Meals (the most popular focus among students), Food Science or Nutritional Science. Two periods of working life practice give our students a unique understanding of the conditions of food and meal related businesses.

Currently there are efforts being made to develop a Master's degree programme within the area of nutrition and health at Kristianstad University, opening up new opportunities and challenges within higher education for students, teachers and researchers alike.

### **Evaluation of the educational effort and conclusions**

The general perception is that the gastronomy students are content with their education and further careers. An alumni inquiry conducted during spring 2011

will hopefully confirm this notion, giving us updated data to present during the conference. As the Swedish Government sees it, Sweden has every chance of becoming Europe's leading culinary nation (Ministry of Agriculture, 2008)<sup>1</sup>. However, the Swedish food and meal sector is characterized by a relatively low level of education and an uneven size structure. So what would be the role of Gastronomist in the new food nation? We need to further pinpoint and identify the specific qualifications that are required in the Gastronomist of the future. Our hope is that new contacts and inputs from international education within culinary arts and gastronomic sciences will help us in this quest!

### **Reference**

1. A report on Sweden as the new culinary nation – how do we get there and why is it important? Ministry of Agriculture, July 2008. Article No. Jo 08.017.

## **The Portuguese tool for menu planning for school children**

**Rocha A., Afonso C., Santos M.C.T., Morais C., Franchini B. and Chilro R.**

*Faculty of Food Science and Nutrition, Oporto University*

### **Aims**

In Portugal, the number of children attending public schools has been increasing every year. The school canteen assumes an unquestionable and increasing responsibility for the promotion of healthy eating habits and also for the supply of safe meals in an adequate social context. With this purpose the Faculty of Nutrition and Food Science of Porto University designed and created an informatics' tool to help planning healthy menus in a safe context: the System of Planning and Evaluation of School Meals.

### **Methods**

The tool focuses on four main areas: menu planning, menu evaluation, evaluation of the sanitary aspects and environment, and current food policies. The software was developed to allow both quantitative and qualitative approaches.

For the qualitative evaluation of meals, users can develop a menu step by step, including ingredients and the quantities needed for the different components, to obtain the final meal and menu. It also allows the analysis of the menu concerning variety, daily, weekly and monthly. Data editing is possible at every step of the process. A database was created for nutritional evaluation, including national and international foods and using as reference Portuguese Food Composition Tables and others.

### **Results and conclusions**

The recommendations used to evaluate the nutritional balance were from the World Health Organization and the United States Department of Agriculture and Institute of Medicine. These were the basis to establish the energy adequacy and distribution of nutrients for food intake considering the four age groups, which were considered for this goal.

In addition, two quantified grids were developed according to National, European and International references, to the sanitary / environment evaluation, one directed to canteens that produce meals and the other for the ones that only distribute meals, and a check list was created to enable the characterization of schools in terms of food policies. With the exception of the last check list, the

reports are automatically produced by this software and can help to establish and rank priorities for action in a healthy environment context.



## **Culinary surprise: Food service with sun-dried beef in the Nigerian environment**

**Togonu-Bickersteth L. C. O.V.**

*Wavecrest College of Catering and Hospitality Management, Lagos, Nigeria*

### **Introduction**

Beef served fried, roasted and barbecued is a common variety in many countries, but a challenge is to store when raw, in homes and food outlets, given the unreliability of electric power supply in Nigeria. This work is aimed at looking at the effectiveness of preserving beef in the form of cured and sun-dried beef. Today we value curing more for its gustatory than its preservation effects. The process imparts a unique flavour, aroma and texture to animal proteins. Reliable data in the World market about sun-dried beef as a viable alternative for raw beef storage is limited. Moreover, empirical data is limited on the potential of sun-dried beef to provide a different flavour profile and to expand the range of beef menu options in food service operations to ‘tickle the modern consumer’s palate’.

### **Aim**

This study was therefore conducted to assess the knowledge of, attitudes to, and acceptability of sun-dried beef in a Nigerian environment. It was also conducted to assess the potential of sun-dried beef to contribute to culinary innovation in food service operations.

### **Method**

150 questionnaires were administered to elicit information from different classes of potential consumers in Nigeria. The survey sought information from the following: demographic classifications – housewives (50) and students (60) (mainly females), workers (40) (male and female) – bankers, civil servants, businessmen/women, doctors, lawyers etc. Consumer knowledge about specific locally dried beef products, including bush meat, kilishi and conditions of raw meat storage were measured. Sensory evaluation of sun-dried beef dishes were also conducted using 20 panellists (8 men and 12 women).

### **Results and discussion**

The survey revealed that 70% had a fair knowledge about types of meat (antelope meat, bush meat, kilishi, tinko). 80% had eaten some of these types, 70% would chose dried meat in known forms (kilishi, bush meat) at food outlets, 75% indicated power supply available a few hours a day, 70% indicated

that power supply affected their storage of beef, 90% depend on power supply to store raw meat and 75% indicated interest in dried meat treatment to prevent meat spoilage due to irregular power supply. A 4-point scale was used by panellists to grade the organoleptic qualities of the sun-dried beef dish: colour (COL), taste (T), flavour (F), Texture (TXT). Taste and flavour scored highest by panellists.

### **Conclusion**

The sample was small, but then the result showed that these consumers have a keen interest in sun-dried beef. Its benefits were acknowledged, given issues with electric power supply. Its taste and flavour appealed to consumers/panellists. The potential to expand the range of sun-dried beef in menu options was revealed.