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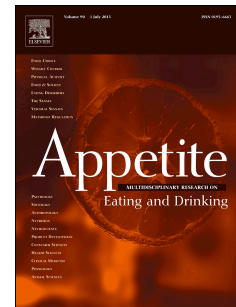
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Traditional foodstuffs and household food security in a time of crisis**Belal J Muhialdin^{1,2}, Viachaslau Filimonau³, Jamal M. Qasem⁴, Hussein Alboory⁵**

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Abstract:

Traditional foodstuffs play an important role in household food security. No research has, however, attempted to examine traditional foodstuffs in light of disasters and crises. Such research can provide a useful outlook on how traditional foodstuffs can aid households in a situation of disrupted food supply. This outlook becomes relevant in view of future disastrous events that can undermine household food security, especially in poor disadvantaged communities. This study examined the role of traditional foodstuffs during a major crisis. The study adopted an ethnographic perspective and the method of semi-structured household interviews to explore how traditional foodstuffs were used by communities in the city of Mosul, Iraq, under the ISIS administration and during the liberation war (2016-2017). The study showcased the critical role of traditional foodstuffs in survival of local households. It highlighted the importance of cross-generational knowledge of traditional foodstuffs in community preparedness for disasters and crises. The study proposed to integrate traditional foodstuffs into governmental strategies on household food security in Iraq, and beyond. It suggested including traditional foodstuffs in the humanitarian food supply chains in the regions prone to disasters and crises. Future research should examine the prerequisites for such inclusion, especially from the viewpoint of societal and political acceptance of traditional foodstuffs and methods of their production.

Keywords: household food security; food supply; community nutrition; disaster management; war zone; Iraq

1. Introduction

Traditional foodstuffs, defined as the food associated with a specific locality where it has been produced and consumed for a long time and become part of local residents' heritage (Guerrero *et al.*, 2009), are studied in anthropology (Renko, and Bucar, 2014), sociology (Guerrero *et al.*, 2009), nutrition (Grivetti and Ogle, 2007), migration (Rabikowska, 2010) and tourism (Bessiere and Tibere, 2013). Academic interest in traditional foodstuffs is determined by their ability to provide a cultural identifier or marker for communities (Pieniak *et al.*, 2009). Traditional foodstuffs are embedded in national cultures as part of emotional and spiritual connection to people's land and origin (Delind, 2006). This raises questions about why and how certain foodstuffs have become 'traditional' (Trichopoulou *et al.*, 2006), but also how the appeal of these traditional foodstuffs to local communities can be sustained in a globalised world (Trolie *et al.*, 2016).

Traditional foodstuffs play an important role in household food security by providing nutrition (Grivetti and Ogle, 2007) and familiar taste (Trichopoulou *et al.*, 2006). Traditional foodstuffs are affordable and sustainable because they are produced locally (Govender *et al.*, 2017), whilst their production involves basic machinery, or even manual power, with low energy and capital investment requirements (Joardder and Masud, 2019). Traditional foodstuffs are safe as they have been continuously consumed by previous generations (Li and Gänzle, 2020). Traditional foodstuffs are healthy because their production involves traditional techniques with limited or no use of artificial additives (Trichopoulou *et al.*, 2006). Traditional foodstuffs can enhance household nutrition and improve food security of local communities, especially in deprived and remote regions (Govender *et al.*, 2017).

Household food security can be endangered by natural (Wheeler and Von Braun, 2013) and man-made disasters (Martin-Shields and Stojetz, 2019). Disasters and crises disrupt commercial food supply chains, thus exposing households to the risk of food scarcity

and under-nutrition (Béné, 2020). Humanitarian missions do not always aid in food provision during disastrous events due to the associated dangers (Fenton, 2003). The challenge is particularly pronounced among deprived and remote communities, especially in developing countries (Colón-Ramos *et al.*, 2019). The problem of accessing nutritious food by households was demonstrated in the case of a natural disaster in Vanuatu (Wentworth, 2020) and a war crisis in South Sudan (Thulstrup and Henry, 2015). Disastrous events can endanger household food security even in developed countries. The Covid-19 pandemic prompted panic buying and stockpiling behaviour which prevented many households from procuring foodstuffs they wanted/needed (Hobbs, 2020). The pandemic demonstrated the fragility of commercial food supply chains relying on multiple actors (Filimonau 2021). Covid-19 exposed the vulnerability of households in many developed and developing countries to sudden, disastrous events and highlighted the need to improve household preparedness for their future occurrence (Leddy *et al.*, 2020).

Traditional foodstuffs can be important in household food security in a time of disasters and crises (Trichopoulou *et al.*, 2007). Traditional foodstuffs are familiar, tasty and nutritious; they require minimal or no cooking, which suggests they provide a good alternative to supermarket bought food when this food becomes unavailable (Kabak and Dobson, 2011). Given their cultural embeddedness, traditional foodstuffs are often habitually stockpiled by households (Pieniak *et al.*, 2009), implying they can satisfy household nutritional needs when commercial food supply is disrupted.

Despite the potential importance of traditional foodstuffs for household food security during disastrous events, the literature on this topic is scant. Lynn *et al.* (2013) discussed the impacts of climate change on traditional foodstuffs consumed by tribal communities in the USA. Although this study highlighted the important role of traditional foodstuffs in nutrition of deprived and remote communities, it did not explicitly elaborate on how traditional

foodstuffs can aid in household survival in a time of crisis. Schuster *et al.* (2011) reported traditional foodstuffs as a vital source of nutrients for residents of remote communities in Canada. This study did not, however, consider how/if these communities consumed traditional foodstuffs during disastrous events.

This paper examines the role of traditional foodstuffs in household food security in a time of disasters and crises. The objective of this paper is to explore what traditional foodstuffs are procured and consumed during disastrous events alongside the role these foodstuffs play in household nutrition. The paper aims to provide evidence on the importance of traditional foodstuffs in a time of crisis, thus showcasing the need for their closer integration in food management and policy. The paper reports on a case study of the city of Mosul in Iraq whose communities were stranded in a war zone from October 2016 to July 2017. The paper sheds light on how local households survived during the war by satisfying their needs in nutrition. The paper demonstrates the importance of traditional foodstuffs in providing necessary nutrients to local communities during a major crisis.

2. Literature review

2.1. Defining traditional foodstuffs and their societal role

Traditional foodstuffs have originally been defined as “[*regional food*] products with a protected designation of origin (PDO)” (p.199), but also as “poorer people’s food” (p. 201) and “old-fashioned food” (p.202) (Kuznesof *et al.* 1997). From a consumer perspective, traditional foodstuffs are defined as “a [*food*] product frequently consumed or associated with specific celebrations and/or seasons, normally transmitted from one generation to another, made accurately in a specific way according to the gastronomic heritage” (Guerrero *et al.* 2009, p.348). This definition assigns particular value to the word “traditional which means proven usage [*of food*] in the community market for a time period showing

transmission between generations; this time period should be the one generally ascribed as one human generation or at least 25 years” (Guerrero *et al.*, 2009, p.346). A simpler definition of traditional foodstuffs is offered by Jordana (2000, p.147) who posits that “in order to be traditional, a [food] product must be linked to a territory and it must also be part of a set of traditions, which will necessarily ensure its continuity over time”. Similarly, Weichselbaum *et al.* (2009, p.7) define traditional foodstuffs as those “perceived as well-known foods [in one region or another] which are consumed from childhood and which were already consumed by grandparents”. Religion is important in defining traditional foodstuffs; for example, date fruit is recommended for consumption in several verses of the Quran (Baliga *et al.*, 2011). This highlights the cultural influence on how traditional foodstuffs are defined given that religion represents a cornerstone of national culture (Alonso, 2015).

The above definitions emphasise the role of place attachment (Cayot, 2007) and cross-generational perception of cultural value (Kuhnlein, and Receveur 1996) in how/why some foodstuffs have become ‘traditional’ in certain societies. Therefore, traditional foodstuffs are recognized based on their locality within one region and/or country, but also outside their regions of origin, as the “ordinary food products” (Guerrero *et al.*, 2009, p.348). The long-established traditions and cost-effectiveness of traditional foodstuffs represent a prime motivation behind why people purchase, store and consume traditional foodstuffs (Platania and Privitera, 2006). Taste and nutritional qualities of traditional foodstuffs provide another reason why they remain popular (Trichopoulou *et al.*, 2006). Examples of traditional foodstuffs are insects in Japan (Mitsuhashi, 1997), corn bread in Italy (Claudia, 2013), *Amaranth* [a type of grain] in Mexico (Rojas-Rivas *et al.*, 2019), *Nduduagworagwo* [a type of legume] in Nigeria (Duru *et al.*, 2012), *Shorbat Adas* [lentil soup] in Iraq (Ismael *et al.*, 2013), *Al-Mshabak* [sweet pastry] in Syria (Alyousef *et al.*, 2016) and *Etliekmek* [a pizza like dish] in Turkey (Büyük *et al.*, 2020).

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149 **2.2. Traditional foodstuffs and household food security in a time of crisis**

150 Food security explains the condition when people have access to “*sufficient, safe and*
 151 *nutritious food that meets their dietary preferences for an active and healthy life*” (Borch and
 152 Kjærnes, 2011, p.138). Food security involves three elements of food: (1) availability; (2)
 153 production; and (3) consumer who is represented by an individual or households (Carletto *et*
 154 *al.*, 2013). Food security is paramount to sustain nutrition of local communities, especially in
 155 deprived and remote regions, as it aims to ensure that food can be continuously produced and
 156 made available to final consumers at affordable price (Kaiser, 2011).

157 Disasters and crises endanger food security by disrupting commercial food supply
 158 chains (Filimonau, 2021). When a disastrous event strikes, the institutions of power and non-
 159 governmental organisations have limited routes to supply food due to damaged infrastructure
 160 and/or risks of its restoration (Kovacs and Spens, 2007). This disables two elements of food
 161 security, i.e. (1) food availability and (2) food production. This threatens household nutrition
 162 as the disruption drives food scarcity and, consequently, malnutrition and hunger (Leddy *et*
 163 *al.*, 2020).

164 During disasters and crises, the foodstuffs stored in advance often represent the only
 165 source of household nutrition (Chitwood *et al.*, 1992). The choice of these stored foodstuffs
 166 depends on local consumer preferences. For example, in South East Asia, in preparation for
 167 disastrous events, the traditional fermented soybean (*Tempe*) is stored in place of dairy
 168 products (Hartini *et al.*, 2005). Traditional foodstuffs are important in enhancing household
 169 food security in challenging times (Schuster *et al.*, 2011) as they can aid in surviving due to
 170 their affordability (Trichopoulou *et al.*, 2007). Although the potential of traditional foodstuffs
 171 to improve local food security has long been acknowledged (Schuster *et al.*, 2011; Power,

2008; Lambden *et al.*, 2007), the role of traditional foodstuffs in overcoming disasters and crises is yet to be established (Elliott *et al.*, 2011).

A disaster or crisis is defined as a non-routine event that occurs naturally, such as floods, storms and earthquakes, or because of anthropogenic actions, such as war conflicts (Leaning and Guha-Sapir, 2013). Disastrous events cause income loss and lead to a decline in the household purchasing power (Béné, 2020). Disasters and crises disrupt the supply of vital commodities, such as food and water (Kovacs and Spens, 2007). 'These factors detrimentally affect food availability and accessibility and result in either food scarcity or starvation (Wentworth, 2020). For example, Oliver *et al.* (2019) reported the challenges of household nutrition during a flood event due to shop closures. Macintyre *et al.* (2006) discussed the importance of providing a sustained supply of food and water for households affected by an earthquake.

A war crisis can cause severe food insecurity in households (Barrett, 2010). Food shortages and food price hikes prior and during the war impact negatively household nutrition, especially in poor(er) communities (Compton *et al.*, 2010). For instance, increased rates of morbidity and mortality due to restricted access to nutritious food were reported during the war in Syria (Sikder *et al.*, 2018).

Except for the above study, no research has been undertaken to date on household food security during a war crisis, and the role of traditional foodstuffs in household nutrition during disastrous events remains unexplored. The lack of studies can in part be attributed to difficulties in primary data collection as the households affected by a war can be reluctant to share their first-hand experience. This paper aims to at least partially fulfil this knowledge gap with a case of communities in the city of Mosul, Iraq, under the ISIS administration and during the liberation war (2016-2017).

3. Materials and methods

3.1. The case study area of Mosul, Iraq

Traditional foodstuffs in Iraq date back to the Mesopotamian civilizations with their unique culinary heritage (Ray, and Joshi, 2014). As part of this heritage, many Mosul households prepare food supplies for the winter season through the process known as *Moona* (Nasrallah, 2013). These food supplies are mostly represented by the foodstuffs considered by local communities as ‘traditional’, such as dried bread (*Khobiz Rikak*), pickled vegetables (*Turshi*), sun-dried vegetables (*Khadrawat Mujafafa*), sesame paste (*Tahiniyya*), sesame confectionary (*Halawa Tahiniyya*), date syrup (*Debes*), dried date fruit (*Tamar*), aged cheese (*Jeben*), cracked parboiled durum wheat (*Burghul*) and fermented beef (*Basturma*) (Stone *et al.*, 2020; Ali, and Batu, 2020; Abbès *et al.*, 2011). Most of these foodstuffs are plant-based and sustainably-produced; they have high nutritional values helping local residents to survive food shortages. Appendix 1 reviews nutritional qualities of traditional foodstuffs in Mosul. The Mosul households have transferred the knowledge of making and storing traditional foodstuffs from parents to children. Mothers would teach daughters how to make and cook traditional foodstuffs.

The long history of wars in Iraq has strengthened the use of traditional foodstuffs by local communities. The wars included the Iraq revolution in 1958, the Iraq–Kurd conflicts in 1961–1963; 1974–1975; 1985–1993; 1996, the Iraq–Iran war (1980–1988); and the Gulf war (1990–1991) (Romero, 2011; Hanson *et al.*, 2009). During these wars, local communities experienced food scarcity which prompted households to stockpile traditional foodstuffs in preparation for future crises (Sorby, 2006). The ISIS occupation of Mosul in 2014-2017 revealed the inadequacy of commercial food supply. During the occupation, but also during the liberation war, an estimated 2 million people suffered from extreme food shortages (Lafta *et al.*, 2019). Food scarcity was particularly pronounced in the West Bank of Mosul

represented by the Old City and largely populated by poor(er) households. These households experienced prolonged periods of continuous war, i.e. 7-9 months. Although food shortages were also observed in the East Bank of Mosul, mostly populated by rich(er) communities, these shortages were less pronounced due to shorter war periods.

3.2. Data collection

Given the paucity of studies on the role of traditional foodstuffs in household food security in a time of crisis, the methods of qualitative research were adopted for primary data collection and analysis. Qualitative research answers the questions ‘why’ and ‘how’ as opposed to ‘what’ and ‘when’, thus offering scope for more in-depth examination of the phenomenon of interest (Hennink *et al.*, 2011). Qualitative research is more suitable for studies that are exploratory in nature and that aim to discuss sensitive topics (Silverman, 2013), such as the challenges of household nutrition and survival during a war. This is because it enables recording people’s emotions, thus triggering more sincere and honest responses (Adams *et al.*, 2007).

An ethnographic perspective was applied. As a method of qualitative research rooted in constructivism, ethnography provides scope for detailed exploration of culturally-embedded phenomena (Bernard, 2006), such as traditional foodstuffs. Ethnography combines views of the representatives of the studied cultures and those of researchers (Sanjek, 2000). Such a combination facilitates a better comprehension of the examined phenomenon and enables its positioning in the current body of knowledge. Further, ethnography offers an opportunity to adopt a historical outlook by recording how a certain aspect of social life, such as household nutrition, has evolved with time (Freedman, 2016). Given that the Mosul communities were entrapped in a war zone for a prolonged period of time, a historical outlook was deemed

particularly useful and relevant to understand how household food security changed as the war unfolded.

The method of in-depth, semi-structured interviews conducted with households trapped in a war zone in Mosul was used to collect primary data (Silverman, 2013). Household interviews represent a popular research method in food studies as they provide a broader perspective on such issues as household food security and nutrition (Hamelin *et al.*, 2002). Household interviews were preferred to interviewing individual household members in order to gain a more comprehensive picture of the studied reality and obtain more diverse opinions from all actors concerned.

An interview protocol was developed grounding on the literature review. Following an ethnographic perspective, the protocol aimed to capture the situation with household food security and the role of traditional foodstuffs prior to the war and during the war, but also, for longevity and consistency of analysis, after the war. The questions were developed ad-hoc due to no past research, suggesting the interview protocol could not be informed by previous studies. The protocol was first developed in English, the language of the literature review, and then translated in Arabic using the back translation technique. The protocol was pre-tested with three volunteer households and some minor modifications related to language clarity were applied to the protocol following the pre-test. A copy of the protocol is provided in Appendix 2.

Participants were purposively recruited. Although this sampling approach does not guarantee representativeness and generalisability, it suits research contexts where the study topics are characterised by sensitivity (Cresswell, 2007), such as household nutrition during a major crisis. To recruit willing participants, the research team walked from door to door in the parts of Mosul entrapped in the war inviting local households to contribute to the study. Given the substantial differences in household food security experienced by the residents of

the West and East Bank parts of Mosul, the representatives from both parts of the city were recruited in almost equal proportions, 11 and 9, respectively.

Interviews were held within the period of 20th October and 21st November 2020 and lasted, on average, 44 minutes. They were digitally recorded for subsequent transcription. In line with the adopted ethnographic perspective, interviewing was organised in the studied households whereby the research team was shown around to better explain the challenges of household nutrition during the war. A small financial incentive was offered to participants to compensate for the time taken to contribute to this study but the absolute majority did not accept it. Informed consent was obtained from all subjects before the study.

In total, 20 households were interviewed and interviewing was stopped after new participants were found to provide no or little new material. This is known as ‘saturation’ and, although it becomes of less relevance for social science research (Braun and Clarke 2021), Thomson (2010 cited by Marshall *et al.* 2013) posits that saturation can be reached with 10-30 interviews, the range which this study falls into. Table 1 lists the features of the households that took part in this study. 11 households were from the West of Mosul, 10 households were from rich community. The households consisted of, on average, 12 members and had been under war for an average of 5.6 months.

Table 1: Interview participants (n=20)

Interview code	Household structure	Household features	Place of residence	Duration under war
Household 1	3 males, 3 females, 2 children	Poor family in middle income community	East of Mosul	5 months
Household 2	1 male, 1 female, 3 children	Poor family in poor community	West of Mosul	3.5 months

Household 3	3 male, 2 female, 6 children	Rich family in middle income community	West of Mosul	9 months
Household 4	6 male, 5 female, 9 children	Rich family in middle income community	East of Mosul	3 months
Household 5	1 male, 1 female, 2 children	Rich family in poor community	West of Mosul	9 months
Household 6	5 male, 5 female, 6 children	Rich family in poor community	East of Mosul	3 months
Household 7	4 male, 4 female, 5 children	Poor family in poor community	West of Mosul	9 months
Household 8	1 male, 1 female, 9 children	Rich family in rich community	East of Mosul	1.5 month
Household 9	1 male, 1 female, 8 children	Middle income family in middle income community	East of Mosul	2 months
Household 10	4 male, 6 female, 9 children	Middle income family in poor community	West of Mosul	9 months
Household 11	2 male, 1 female, 13 children	Poor family in poor community	West of Mosul	9 months
Household 12	7 male, 5 female, 6 children	Poor family in poor community	West of Mosul	9 months
Household 13	2 male, 2 female, 2 children	Middle income family in middle-income community	East of Mosul	2 months
Household 14	3 male, 4 female, 11 children	Rich family in middle- income community	East of Mosul	1.5 month
Household 15	1 male, 1 female, 4 children	Poor family in poor community	West of Mosul	9 months
Household 16	2 male, 6 female, 6 children	Rich family in rich community	East of Mosul	1.5 month
Household 17	2 male, 2 female, 2 children	Poor family in poor community	West of Mosul	9 months
Household 18	1 female, 4 children	Poor family in poor community	East of Mosul	3 months
Household 19	3 male, 2 female,	Poor family in poor	West of Mosul	9 months

	5 children	community		
Household 20	3 male, 4 female, 11 children	Rich family in rich community	West of Mosul	5 months

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291 The interview transcripts were professionally translated and analysed thematically
292 using the protocol suggested by Braun and Clarke (2006). As part of this protocol, each
293 member of the research team read each interview transcript carefully. Coding was applied to
294 identify the main themes, sub-themes, codes and sub-codes. The coding frames were then
295 cross-compared to achieve consensus in interpretation (Braun and Clarke 2020). In case of
296 disagreement, another member of the research team read the transcripts to provide an
297 alternative outlook to ensure coding reliability (Braun and Clarke 2020). The coding structure
298 is presented in Figure 1. Representative quotes were derived from the interview transcripts to
299 add face validity. These were appropriately labelled and marked in the main text when
300 writing the study's results up.

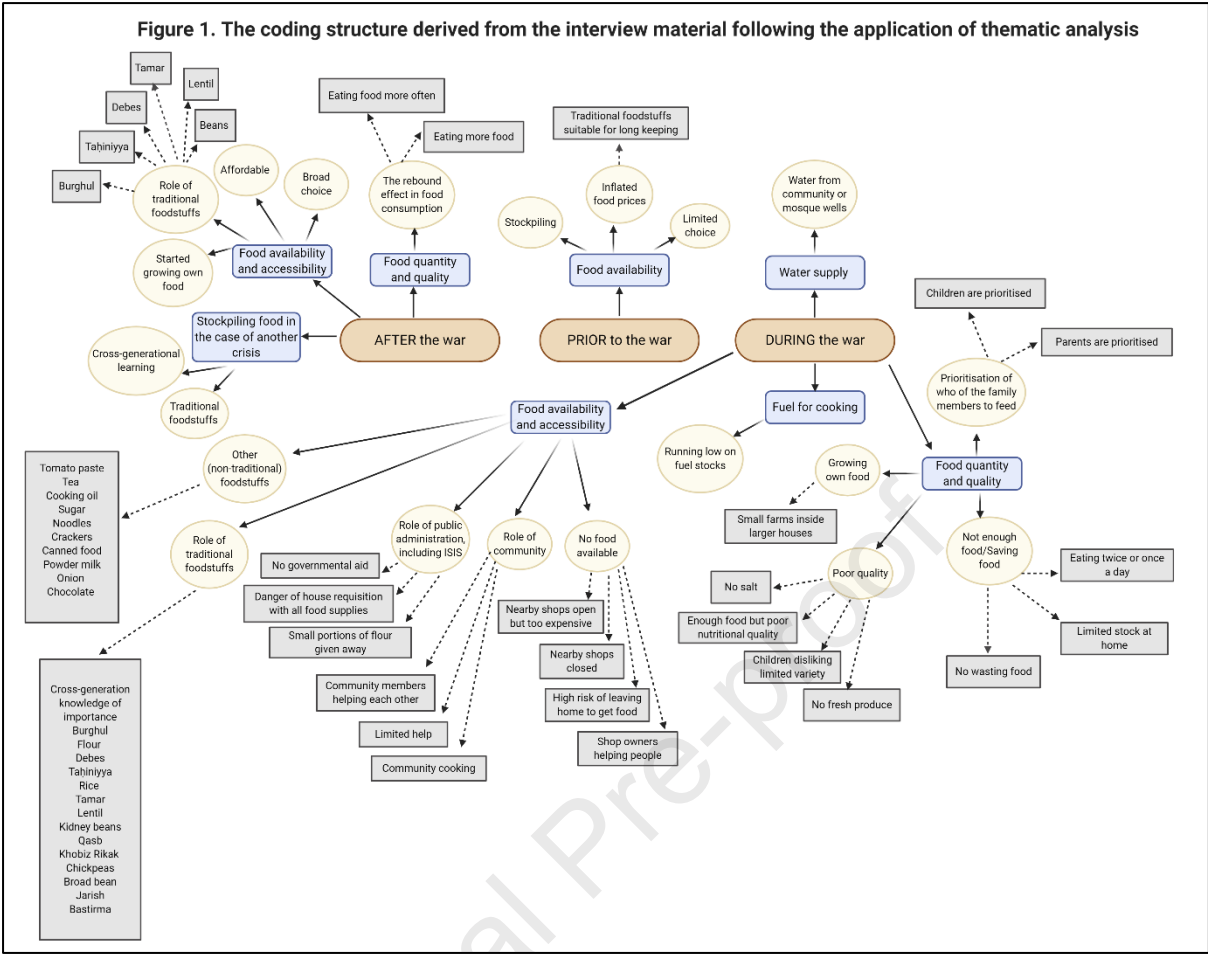


Figure legend: orange colour indicates major themes. Blue colour indicates sub-themes.

Yellow colour indicates codes. Grey colour indicates sub-codes.

4. Results

4.1. Traditional foodstuffs prior to the war

As the war was approaching Mosul, its residents started stockpiling food in anticipation of food shortages. Stockpiling involved various types of food, but traditional foodstuffs were the most popular. There was association between household wealth and the amounts and variety of food procured, i.e. wealthier households stockpiled more food and a better variety of food. Although poor(er) households stockpiled less food in general, they procured more of traditional foodstuffs. Popularity of traditional foodstuffs with poor(er) households was attributed to their affordability, high nutritional quality and suitability for long keeping. As

the war was getting closer, availability of (traditional) foodstuffs worsened because the stocks were cleared and prices went up. This left many poor(er) households in a disadvantaged position as they were unable to stockpile desired amounts of food.

Stockpiling of traditional foodstuffs by the local residents was part of a cultural tradition and a product of cross-generation learning. The value of traditional foodstuffs and their importance in a time of crisis was broadcast from one generation to another. Traditional foodstuffs were seen valuable given that Mosul had been a war zone on numerous occasions in the past. Traditional foodstuffs were further valued in the time of other, less significant, past crises, such as in winter seasons with their limited employment opportunities.

The study participants repeatedly mentioned that they always held certain stocks of traditional foodstuffs as a matter of habit, and that they started replenishing these stocks immediately after they first heard of the war. Interestingly, traditional foodstuffs were preferred to canned food. Except for tomato paste, canned food was perceived low quality and high in chemical content. It was also unpopular because of the public fear of its Halal incompliance. Although Halal requirements could be disregarded in a time of crisis, traditional foodstuffs were deemed safer given their familiarity, local production and a long-established tradition of making and eating.

4.2. Traditional foodstuffs during the war

Despite stockpiling, food shortages were common during the war. These occurred because some households under-estimated the length of occupation, while some were expelled from their houses by the ISIS administration with all food stocks left behind. Many households lived under a constant threat of house requisition which was considered disastrous as very limited food supplies could be taken by residents upon departure.

Some food was available in the few shops that remained open. This food was, however, expensive while the small number and the restricted location of shops made trips to them dangerous. Some shopkeepers helped local residents by providing food in return for a later payment; this help was, however, ad-hoc and limited to provision of basic foodstuffs, such as flour and rice. The ISIS administration provided very little food with miniscule quantities of flour given away on an irregular and infrequent basis.

Substantial differences were recorded in food availability between the rich and poor households. While many rich households had sufficient food stocks, they suffered from the lack of variety. Fresh food, such as fruits, vegetables, milk and meat were either unavailable or available at a very high price. As rich households were accustomed to eating various foodstuffs before the war, they found it difficult to adjust to the limited choice during the crisis. In contrast, poor(er) households did not always have enough food as many did not stockpile sufficiently. Poor(er) households had to limit the frequency of eating and prioritise who to feed with children and sick household members being a priority. For poor(er) households the lack of fresh food was critical due to its complete unaffordability. To partially solve this problem, some residents grew fruits and vegetables inside their houses. The supply of this home-grown produce was, however, very limited due to space constraints. Food shortages were particularly pronounced in those parts of Mosul that experienced prolonged occupation. Here, the risk of leaving home to procure food either from shops or friends and relatives was very high, especially in the final stages of the war. For some households, this meant eating anything possible to avoid starvation, see the quote below:

'This is my first time to tell the story of how we survived. After 6 months of the war, our flour and Burghul finished, so we started eating grass from the garden and the leaves from the few trees we had. Next, we ate our pigeons [popular pets

in Iraq] and this was very difficult. Not only me, but also my children, had to eat them to survive... Last we ate our cats, and it was the thing I'd never imagine doing in my life. It's very difficult and no words can describe what happened and God knows how hungry the children were' (H15)

As food was scarce, no wastage occurred, especially in poor(er) households, with all foodstuffs being consumed and any leftovers processed to cook other meals. Energy for cooking was sometimes problematic, especially, in the winter, as some households did not store enough fuel stock. In this case, anything suitable for burning, such as old furniture, was utilised. For better efficiency, fuel was used not only to cook food but also to heat the house.

Procuring water for cooking and drinking, but also washing, was a major challenge. It was available from communal or mosque wells but accessing these wells was risky. In addition, this water was of poor quality due to contamination given that no well up-keeping was done during the war. Water pre-treatment in the form of boiling, for instance, was not always possible due to the lack of fuel stock, as per above. Some households reported their members were diagnosed with water-borne diseases, such as kidney stones and skin infections, in the result. The lack of water made use of some traditional foodstuffs problematic. For example, beans would need to be soaked prior to cooking. Community collaboration was important in food provision during the war. Community members helped each other by sharing food; there were also reported instances of community cooking whereby a number of households would prepare food for each other. These practices were, however, risky as large gatherings were prohibited by ISIS and, therefore, not widespread. Clear differences between rich and poor(er) households were observed in terms of the extent of community collaboration. While poor(er) households collaborated more often, rich households did not which was explained by their better food self-sufficiency. This showcased

the varied scale of social and network capital among Mosul households during the war which was larger for poor(er) residents, thus increasing their chances of survival.

Traditional foodstuffs were vital in food provision during the war among both rich and poor(er) households. In particular, Tahiniyya; Debes; Burghul; Flour; Chickpeas; Tamar; and Qasb were frequently mentioned as the foods that aided local residents in surviving the war. Tahiniyya, Debes and Qasb were used in the morning and for snacking as they did not require cooking. However, as these traditional foodstuffs could not provide sufficient nutrition, Burghul, Flour and Chickpeas were utilized as a main meal. For example, Burghul was used to cook porridge, and flour was used to prepare Haso, a traditional Iraqi dish which involved flour mixed with water, especially in poor(er) households and/or when other food supplies ran low. Aside from the above traditional foodstuffs, rice, lentils and beans were also popular due to their nutrition. Importantly, adequate nutrition was of little consideration among poor(er) households and satisfying hunger was seen far more important. In contrast, rich households characterised by better food availability and accessibility spoke of nutrition but largely in the context of childcare provision:

'Traditional foodstuffs are part of our culture and we eat them all the time and always keep them for emergency. Our grandparents talked about how important these foods in the time of emergency were, and this is how we learnt of them... In this war we stored Khobiz Rikak, Tahiniyya, Debes, date fruits and Burghul. These foods we like to eat and they can be stored for long time. Tahiniyya and Debes we store them for 2-3 years and they still have good taste. Burghul can be kept for 1 year... We ate at least two meals made of these traditional foodstuffs every day during the war. The good thing about date fruits, Tahiniyya and Debes is that they can be eaten without cooking and they are tasty, we ate them every

morning, not only in the war, but also in normal days of our life. Burghul was very good as it could replace rice and it's fast to prepare, 5 minutes, it's ready and saved fuel, and my family loved it, we used to eat it 2-3 times in the week even before the war... ' (H19)

4.3. Traditional foodstuffs after the war

After the liberation, eating habits of Mosul residents were quickly back to 'normal', i.e. those they had before the war. The commercial food supply resumed and food became broadly available in shops and foodservices across the city. A clear rebound effect in food consumption was observed whereby more food would be eaten and in greater varieties to compensate for the extreme scarcity experienced during the war. This not only concerned consuming food at home, but also when eating out. Although the role of food was no longer seen as 'functional', i.e. to satisfy hunger, but rather 'hedonic', i.e. to enjoy taste and flavour, little consideration to food healthiness and nutrition was given.

Traditional foodstuffs retained their importance after the war was over. One reason was in that traditional foodstuffs were liked by all family members and therefore still used frequently. Another reason was attributed to the long-established cultural tradition of storing certain quantities of traditional foodstuffs in the case of another crisis. Stockpiling of traditional foodstuffs continued as a result, especially by poor(er) households. For instance, reference to a cold winter, a sudden flooding event or even another war was made as an explanation to why traditional foodstuffs remained popular with Mosul residents after the liberation (see the quote below).

'I have no doubt we'll keep to use traditional foodstuffs as they've proven themselves as lifesaving during the previous wars. My father said in 1959 our

family survived eating Burghul and drinking tea for 2 months during that war, so I'm very sure we will need to store these foods for anything unexpected. I remember the Mosul city was captured by ISIS in few days, so we never know what may happen next and we have to be ready... When I keep the food in my storage room, we feel safe as the situation in Iraq not stable and anything can happen anytime. In the time of another emergency we'll not find these foodstuffs available or they'll be 3 to 4 times more expensive. Therefore, we always keep 100 kilo flour, 100 kilo Burghul, 50 kilo beans, 50 kilo chickpeas, 50 kilo rice, 50 kilo sugar, 10 kilo Tahiniyya, 10 kilo Debes' (H8)

Some study participants, however, acknowledged that improved food availability and accessibility after the war imposed certain detrimental effects on consumption of traditional foodstuffs. Some households were substituting traditional foodstuffs with their imported alternatives in an attempt to try something new. For example, reference was made to olive oil replacing Tahiniyya and honey replacing Debes. However, such substitution was mostly typical of richer households and poor(er) households continued consuming traditional foodstuffs in large quantities.

Following the war, some Mosul households started growing their own food, such as fruits and vegetables in inner courts of their houses. This was to enhance household food self-sufficiency, thus making households better prepared for potential future food shortages. Some households increased storage facilities for food and dug wells in their houses. This is again to stay better prepared for possible future crises.

The downside of restated food availability and accessibility was in increased wastage as some households desired to try as many (new) foodstuffs as possible. However, different attitudes towards food waste were recorded across the board. Some households claimed to be

wasting less food after the war due to the memory of food shortages and how important the food was. Concurrently, some, predominantly rich, households stated to be wasting more food due to its low cost and abundance.

5. Discussion and concluding remarks

5.1. Theoretical contribution

The study demonstrated the value of traditional foodstuffs in a time of crisis, thus adding to the emerging body of literature on the important role played by traditional foodstuffs in lives of local communities (Feagan, 2007). Unlike past research which was concerned with examining how traditional foodstuffs could aid local communities to survive in remote, rural regions (Schuster *et al.* 2011), this current study showcased the instrumentality of traditional foodstuffs in helping residents of urban communities trapped in a warzone. This contributes to the subject area of food anthropology which provides an ethnographic and historical perspective on contemporary social issues related to food production, distribution and consumption (Quave and Pieroni, 2011).

By linking traditional foodstuffs to food consumption during war, this study outlined a new perspective for future research within the anthropology of food. This research should investigate how local, urban or rural, communities survive in a time of crisis, focusing not only on the role of traditional foodstuffs in community nutrition (i.e. ‘how/why do people eat traditional foodstuffs in a time of crisis?’), but also on how these traditional foodstuffs are produced, distributed and stored. Such research can be particularly useful in light of future disasters and crises, such as the Covid-19 pandemic or the unfolding climate change, as these have exposed the vulnerability of traditional food supply chains alongside its negative effects on consumers (Hobbs, 2020). Learning how local, often disadvantaged, communities use

traditional foodstuffs and how these foodstuffs can be made more broadly available will enable better preparedness of these communities for future disasters and crises.

Aside from the subject area of food anthropology, the study contributed to theories of social and network capital (Mintz and Du Bois, 2002) by showcasing their validity in a time of crisis. The study provided empirical evidence to the critical role of social and network capital of local communities in Mosul during the war as a means of overcoming food shortages. Paradoxically, poor(er) communities had richer social and network capital compared to rich communities. This highlights the need to better understand how poor communities build and sustain their social and network capital and how this capital can be most effectively mobilised during a crisis. This is, again, in order to ensure that disadvantaged, poor(er) communities could survive in light of current and future disastrous events. Interestingly, this study highlighted the vulnerability of rich communities if trapped in a crisis for a prolonged time. This is because limited social and network capital will prevent such communities from obtaining help from others. This finding outlines the need to explore how social and network capital of rich communities can be strengthened. While such communities have better resources to survive a crisis, unforeseen circumstances and a sudden occurrence of disasters and crises can negate this resource availability, thus exposing vulnerability.

The study emphasized the cultural role of food, thus contributing to the scholarly discourse on the embeddedness of food in national cultures (D'Sylva and Beagan, 2011). Traditional foodstuffs were found critical for survival of local communities not only in the case of the recent war in Iraq, but also over time. The importance of traditional foodstuffs has for long been known by local communities and transmitted from one generation to another. The mechanisms of such cross-generational learning should be better understood. Further, research has looked at food as part of the cultural identity of local communities (Alonso,

2015), but this has never been considered in a time of crisis. It is paramount to better understand how cross-generation learning happens with regard to traditional foodstuffs as well as their production and preparation methods. This knowledge will be instrumental if modern, commercial food supply chains suddenly stop working. As shown by the Covid-19 pandemic, such situations may result in food shortages (de Paulo Farias and dos Santos Gomes, 2020). Knowledge of the production and consumption routines of traditional foodstuffs can aid in the design of alternative, more localised, food supply chains. As global food supply chains become increasingly vulnerable to disasters and crises, better understanding of the potential of traditional foodstuffs to provide community nutrition can enhance food security of local communities and improve their resilience towards future disasters and crises.

5.2. Practical contribution

The study highlighted the importance of traditional foodstuffs in overcoming food shortages during a crisis. This suggests that decision-makers in Iraq, but also beyond, should integrate traditional foodstuffs in their policies on food supply chain management. Traditional foodstuffs can represent a vital source of nutrients when commercial food supply chains are disrupted. For example, panic buying and stockpiling behaviour during the Covid-19 pandemic brought about, albeit temporary, food shortages (Hobbs, 2020). Traditional foodstuffs can aid in overcoming such shortages and their production, distribution and storage should therefore be encouraged by the institutions of power.

Given the importance of traditional foodstuffs for community nutrition, they should be studied from the viewpoint of nutritional qualities. Better understanding of the nutritional value of traditional foodstuffs can inform the design of recipes or nutrition plans. Such plans can be utilised by local communities to make better use of various traditional foodstuffs from

the perspective of their impact on health. For example, a nutrition plan can incorporate certain traditional foodstuffs suitable for snacking or as a main meal, with temporal variations provided to ensure quality eating for all household members. Such recipes and nutrition plans will be instrumental in the case of future disasters and crises.

Drawing on the above, this study indicated the limited understanding of healthy eating by local communities in Mosul. Policy-makers should, therefore, invest in raising public awareness of how to eat healthily and showcase how healthy eating diets could incorporate traditional foodstuffs, as per above. Preference of traditional foodstuffs over canned food is striking and interventions are necessary to demonstrate that canned food is safe to consume. This is because certain canned food, if procured in sufficient quantities, could have supplemented the routines of food consumption during the recent war, thus making household diets more diverse and increasing their healthiness.

Although a substantial body of research on food supply in a time of disasters and crises has revolved around the topic of the humanitarian food supply (Bounie *et al.*, 2020), it fails to consider the role of traditional foodstuffs within. The practical contribution of this study is, thus, in that it offers scope to understand the importance of integrating traditional foodstuffs in the humanitarian food supply chains. Traditional foodstuffs are familiar to local residents suggesting their consumption will be guaranteed in a time of crisis. Food familiarity and its compliance with local cultural/religious traditions should be an important factor to consider when planning humanitarian aid provision. Evidence shows that, even in a time of disasters and crises, affected communities may refuse to consume food which they find culturally unacceptable or which they know little about (Wentworth, 2020). This study shows that families found it acceptable (though not ideal) to abandon their cultural practices such as the consumption of halal food during the crisis. Nevertheless, integrating traditional foodstuffs in

the humanitarian food supply chain will ensure families continue to eat and maintain their cultural practices during disastrous events.

Lastly, the study shown the importance of water and fuel supply in a time of crisis. Policy-makers of the regions vulnerable to future disasters and crises should, therefore, invest not only in food stocks, but also water and fuel storage. This particularly concerns those regions where traditional foodstuffs consume excessive quantities of water and require fuel for cooking. For example, as this research indicated, while beans represent a quality foodstuff in terms of their nutrition, their use will be restricted in water-scarce regions. Appropriate arrangements are required to provide sustained water supply to aid in community nutrition during disastrous events.

5.3. Limitations and future research

The main limitation of this study is in its restricted geographical focus. Mosul, under ISIS occupation, represented a suitable case to examine the role of traditional foodstuffs in a time of crisis. However, this study's findings should be considered with caution when projected to other geographies, especially outside Iraq. This is because traditional foodstuffs have retained their popularity in Mosul over time but this may not be the case for other regions/countries.

Another limitation is attributed to the type of crisis, i.e. a war, considered in this study. The situation in Mosul was extraordinary as it represented a major military conflict which disabled local food supply chains for a prolonged time. Such conflicts do not happen often which means the experiences of local households recorded in this project can be categorised as unique. Precautions should therefore be taken when translating these experiences to other disasters and crises as a war cannot be compared with, for instance, a period of extensive drought. In such periods, although households may face the problem of food poverty, this problem is less exacerbated as local food supply chains remain functional.

It is important to note that primary data were collected amid Covid-19. The study participants were requested to comment on their experiences during the war and in the time of Covid-19. The answers indicated that Covid-19 was incomparable to the war given that food supply was never interrupted. Although it was unlikely that Covid-19 affected this study's findings, it is acknowledged that primary data collection amid another crisis was a potential limitation.

Sections 5.1 and 5.2 outlined a number of directions for future research. In addition to these, the following studies are deemed promising. The geographical scope of research on traditional foodstuffs should be extended to other world regions, especially remote. Studies should aim to better understand what foodstuffs can be classed as 'traditional' in these regions and these traditional foodstuffs should then be subsequently investigated from the viewpoint of nutrition. This is to establish if traditional foodstuffs can be self-sufficient for consumption by local residents in terms of their health impacts and whether or not they should be supplemented with additional, non-traditional and/or imported, types of food. Traditional foodstuffs in specific regions should particularly be examined in light of future disasters and crises. The ability of these regions to supply the required quantity of traditional foodstuffs during disastrous events should be investigated. The impacts of disasters and crises on local food supply should be modelled to reveal if traditional foodstuffs can be relied upon in a case of emergency. Same applies to the provision of water and fuel whose availability is equally important for survival in a time of crisis, as the quote below indicates:

'What I've witnessed, seeing an old man dead on the road with some food in their hand, made me scared and I realized that, in the time of crisis, the food and water are more important than gold. I lost my son who died trying to find water for the

609 *family. I'll store enough traditional food next time to always be ready and never*
610 *lose another son' (H12)*

611

Journal Pre-proof

Author contributions BJM conceived of the idea, analysed the data, co-wrote the paper; VF designed the study, analysed the data and wrote the paper; JMQ, HA collected data, analysed the data. All authors read and approved the final submitted version.

Ethical approval

We obtained ethical approval from the ethical review board of the Faculty of Food Science, Al-Qasim Green University (reference number: 2020/09–1).

The data were collected following the acquisition of a signed informed consent form from each participant. Prior to this, all participants were explained the purpose of the study and how its results would be used. All participants were reassured of confidentiality, and the voluntary nature of participation was guaranteed, including the right to withdraw at any time.

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1 **Appendix 1**

2 Proximate analysis for the common traditional foodstuff in Iraq (g/100g)

Name	Protein	Fat	Carbohydrate	Calories	Reference
Dry bread (<i>Khobiz Rikak</i>)	11.80	3.61	72.59	370	Kahlon et al., (2019)
Pickled vegetables (<i>Turshi</i>)	ND	ND	ND	ND	NA
Dry vegetables (Khadrawat Mujafafa)	ND	ND	ND	ND	NA
Sesame paste (<i>Tahiniyya</i>)	22.35	58.63	0.00	617	El- Adawy & Mansour, (2000)
Sesame confectionary (<i>Halawa Tahiniyya</i>)	12.22	32.92	51.30	550	Sanja et al., (2015)
Date syrup (<i>Debes</i>)	0.95	2.43	74.24	322	Al-Farsi et al., (2007)
Dry date fruit (<i>Tamar</i>)	1.15	3.25	79.61	352	Al-Farsi et al., (2007)
Aged cheese (Jeben)	50.10	8.11	19.60	351	Abu- Lehia, (1988)
Cracked parboiled durum wheat (Burghul)	9.51	5.31	82.79	417	Ahmed, (2019)
Fermented beef (Basturma)	36.66	2.95	1.17	159	Pushparajan et al., (2012)

3 ND (not determined), NA (not applicable)

4

Appendix 2

Interview protocol, English version. Coloured in red are the probes.

Traditional foods in the time of crises

Start

Thank them for agreeing to partake

Introduce yourself/Introduce the project

Ask to read Participant information sheet/Ask to sign and return a Consent form

Ask for permission to record

Ask for general information related to their household and its structure i.e. (1) number of members and their genders, (2) how long they have stayed in Mosul during the war and (3) where they have lived during the war

Ask for why they did not leave Mosul during the war

Section 1: Food availability and accessibility before the war

- Tell me about your household eating habits before the war.
- Now tell me about what you/your family consider to be a ‘traditional’ foodstuff(s) in Mosul
 - *Make an inventory of what they define as ‘traditional’ foodstuffs*
 - *Examine why these foodstuffs are considered ‘traditional’*
 - *Explore if this has to do with ‘cross-generational learning’/culture*
 - *Explore their opinion on each ‘traditional’ foodstuff if not mentioned earlier*
- Tell me what preparations in terms of food supplies, if any, you made when you knew the war was coming

Section 2: Food availability and accessibility during the war

- Tell me about your experience of getting food during the war.
 - *Identify the household member(s) in charge of food procurement*
 - *Head (male)*
 - *Female members*
 - *Explore how difficult it was to get food*
 - *Discuss food availability*
 - *List the main challenges of accessing food*
 - *Explore the role of shops/retail outlets in providing food*
 - *What shops were open, if any?*
 - *Explore the role of governmental organisations in providing food*
 - *What assistance was provided by the government, if any*
 - *Explore the role of non-governmental organisations*
 - *What assistance was provided by (inter)national NGOs/charities/food banks*

- *Explore the role of local community networks =(network capital) in accessing food*
 - *What assistance, if any, was given by neighbours*
- *Explore the role of social networks (family, relatives and friends = social capital) in accessing food*
- ***Examine how/if water was available and how it was obtained***
- Tell me if you had enough food during the war
 - *Establish how often they had enough food so everyone was happy*
 - *Establish how often they did not eat enough*
 - *Establish if something particular was missing in their food compared to the pre-war period(s)*
 - *Any specific foodstuffs*
 - *Any vitamins and nutrients*
 - *Establish what household members were prioritised in feeding*
 - *Examine what they did if food was not enough*
 - ***Similarly, explore the situation with water***
- Tell me about what/how your family ate during the war
 - *Explore frequency of eating*
 - *Describe 'typical' foodstuffs used for cooking in/eating at*
 - *Breakfast*
 - *Lunch*
 - *Dinner*
 - *Clarify where these foodstuffs came from*
 - ***Similarly, examine how water was used and where it came from***

Section 3: Knowledge of 'traditional' foodstuffs and their role during the war

- Tell me how/if you consumed any of the 'traditional' foodstuffs during the war
- Tell me the reason for consuming these foodstuffs
 - *Explore the pattern of consumption e.g. several times a day, daily, weekly*
 - *Examine how these foodstuffs were obtained*
 - *Prepared and stored in advance --> if so, explore why particular foodstuffs were prioritised*
 - *Purchased --> explore from where/who*
 - *Given by someone*
 - *Obtained from elsewhere e.g. from food banks*
 - *Explore why these particular foodstuffs were used, and not others*
 - *Examine how these foodstuffs were used*
 - *Cooking meals*
 - *Eating on their own*

Section 4: Prospects of using 'traditional' foodstuffs

- 86 • As the war is now over, tell me how your eating habits have changed, if at all
- 87 ○ *Explore what foodstuffs they eat now and why*
- 88 ○ *Examine how these foodstuffs are obtained*
- 89 ○ *Explore if they follow any diet*
- 90 ○ *Examine who makes decisions on what to eat/how to cook*
- 91 ○ *Explore if they have enough food and what they do if there is not enough food*
- 92 *in their household*
- 93 ○ *Examine priorities in feeding different household members*
- 94 ○ ***Explore how water is obtained and used after the war***
- 95
- 96 • Now, as the war is over, how do you use ‘traditional’ foodstuffs, if at all?
- 97 ○ *Explore if they still use them*
- 98 ○ *Examine if some of the ‘new’/non-traditional foodstuffs have replaced the*
- 99 *‘traditional’ foodstuffs*
- 100 ○ *Examine if ‘traditional’ foodstuffs are stigmatised and, therefore no longer*
- 101 *used*
- 102 ○ *Examine if they still prepare and store ‘traditional’ foodstuffs (just in case, if*
- 103 *another war strikes)*
- 104
- 105 • Tell me if ‘traditional’ foodstuffs is something you will use in the future
- 106 ○ *Explore the role of ‘traditional’ foodstuffs in day-to-day nutrition*
- 107 ○ *Explore the role of ‘traditional’ foodstuffs in preparing for future crises*
- 108 ▪ *Specifically war-related*
- 109 ▪ *Not necessarily war related, such as drought or other extreme weather*
- 110 *events*

End

113 Would you like to provide any other information related to this project?

114 Do you have any questions about the interview or project?

115 **Thank you for your participation**

Ethical statement

We obtained ethical approval from the ethical review board of the Faculty of Food Science, Al-Qasim Green University (reference number: 2020/09–1).

The data were collected following the acquisition of a signed informed consent form from each participant. Prior to this, all participants were explained the purpose of the study and how its results would be used. All participants were reassured of confidentiality, and the voluntary nature of participation was guaranteed, including the right to withdraw at any time.