Food and Agriculture Organization of the United Nations

MINISTRY OF NATIONAL ECONOMY

Survey Report

Food safety Knowledge, Attitudes and Practices (KAP) among food consumers in the West Bank and Gaza Strip

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Contents

Tables

Figures

Abbreviations

FAO	Food and Agriculture Organization of the United Nations
KAP	Knowledge, attitudes and practices
MoA	Ministry of Agriculture
MoH	Ministry of Health
MoNE	Ministry of National Economy
NGO	Non-governmental organization
PCBS	Palestinian Central Bureau of Statistics
PSI	Palestine Standards Institution
SPS	Sanitary and phyto-santiary
UNICEF	United Nations Children's Fund
UNRWA	United Nations Relief and Work Agency for Palestine Refugees
USDA	United States Department of Agriculture
WBGS	West Bank and Gaza Strip
WHO	World Health Organization

SECTION 1

SURVEY OBJECTIVES AND METHODOLOGY

1.1 Introduction

Food-borne diseases are an important cause of morbidity and mortality, and a significant impediment to socioeconomic development worldwide, but the full extent and burden of unsafe food is unknown. Precise information on the burden of food-borne diseases can adequately inform policy-makers, allowing them to allocate appropriate resources for food safety control and intervention efforts.

In 2007, the World Health Organization (WHO) listed food safety as an increasingly important public health issue, hence governments all over the world are intensifying their efforts to improve food safety. A study conducted by WHO to estimate the global burden of food-borne diseases revealed that the most frequent cause of food-borne illnesses were diarrheal disease agents, particularly norovirus and campylobacter spp. Food-borne diarrheal disease agents caused 230,000 deaths, particularly non-typhoidal *salmonella enterica* that causes diarrheal and invasive diseases. Other major causes of food-borne deaths were *salmonella enterica, salmonella* typhi, *taenia solium,* hepatitis A virus and aflatoxin. Forty percent of the food-borne disease burden was amongst children under five years of age (WHO, 2015).

To prevent food-borne illness, it is necessary to understand how food becomes unsafe and what proactive measures can be taken to ensure food safety. In this context, FAO commissioned Al Markaz for Development and Marketing Consultancies (Al Markaz) to conduct this study to identify Palestinian households' knowledge, attitudes and practices (KAP) on food safety and KAP gaps as well as to develop a proper educational program for households.

This report presents the main findings of the study, based on a survey of a representative sample of household consumers in the West Bank and Gaza Strip (WBGS).

1.2 Survey Objectives

The overall objective of this study is to profile and analyze KAP on food safety amongst households in order to obtain a better understanding of current levels of awareness and practices. This will assist FAO and its partners to plan and implement educational and awareness activities to promote best practices in food handling at the household level. The study focuses on specific themes related to food safety KAP. The objectives of the survey are to:

- Ascertain consumers' knowledge of proper food hygiene and sanitation.
- Identify the attitudes of household towards food safety.
- Assess the hygiene practices of households across all stages of the food handling chain. Examine the extent to which food safety KAPs are influenced by socioeconomic factors.
- Establish a benchmark that can be used as a reference point in future assessments to measure the effectiveness of health education activities in changing food safety KAPs.
- Suggest an intervention plan tailored to local circumstances and cultural factors that can effectively influence positive behavior change.

1.3 Methodology

The research is based on a household survey, applied to a representative sample of households in the WBGS. The study began with a literature review on food safety to identify the survey's main variables and provide a referential framework for the study, including an outline of the main information matrix for meeting the KAP survey objectives. The process of designing the survey was participatory: Al Markaz initiated the design, while experts from FAO's team, the steering and technical committees of the project "Capacity building programme in support of the Palestinian National Authority — Sanitary and Phyto-Sanitary (SPS) measures" — and related ministries -

Ministry of Agriculture (MoA), Ministry of Health (MoH), Ministry of National Economy (MoNE), Palestine Standards Institution (PSI) - provided feedback and inputs that were fundamental to the final survey design. Questionnaire development, sample design, field work, data management, analysis and reporting methodologies are described below.

1.3.1 Questionnaire Development

Al Markaz's consultants drafted the questionnaire, then circulated it to FAO's team, the steering and technical committees of the project "Capacity building programme in support of the Palestinian National Authority — Sanitary and Phyto-Sanitary (SPS) measures" — and related ministries (MoA, MoH, MoNE, PSI) for their inputs and feedback on the proposed survey variables. Based on the feedback received, the questionnaire was modified accordingly and then submitted to FAO's team and steering and technical committees, for final approval. Al Markaz's survey team further revised the questionnaire to ensure consistency and flow, to remove possible duplications and to fine-tune various variables. The core survey team then administered a pilot survey interviewing 30 households to identify potential problems and to gather feedback on interviewees' perception towards the questionnaire. The questionnaire was finalized based on the findings of this field test. the final questionnaire was approved by all parties.

1.3.2 Sample Design

The study was based on a household-level survey with a representative sample of household consumers. The sample was proportionally distributed according to the population size of Palestinian governorates (North West Bank, Middle West Bank, South West Bank and Gaza Strip), and later stratified according to the type of locality (urban, rural and refugee camp) according to Palestinian Central Bureau of Statistics (PCBS) categorizations. A dual selection process was then applied according to the above considerations, first to select localities and then to select clusters (neighborhoods) within these localities. Within each cluster, 10-12 households were systematically selected using a "random walk" method with a selection interval of four households. In total, the consumer survey covered 1 135 households distributed across the WBGS. The following table shows the distribution of completed questionnaires in the main geographical regions.

Table 1: Distribution of survey sample by main geographical regions

Region	Number of questionnaires
North WB	348
Central WB	248
South WB	168
Gaza Strip	371
Total	**1 135**

1.3.3 Field Work

After field testing and revision, the survey was implemented during February-March 2017 and consisted of:

- Recruitment, training, assignment and monitoring of field researchers: researchers were mobilized to ensure coverage of targeted areas. Researchers were assigned to various regions according to the sample size in each region. Survey coordinators were assigned to follow-up on researchers' work.
- Researchers were trained on appropriate data collection procedures and techniques. The survey management team conducted two training workshops; one workshop in the West Bank and the other in Gaza. The training was very interactive and included a detailed presentation of the goal of the survey and a discussion on each question.
- Data collection/survey deployment: each data collector was assigned to a specific locality and given a schedule for collecting data. Completed questionnaires were submitted to

coordinators for auditing and verification against a set of guidelines. The completed questionnaires were verified before data entry.

- Editing and data entry: All questionnaires were edited using the same instructions that were used for editing during fieldwork. Data from questionnaires was entered into an MS Access template and then transferred to the Statistical Package for the Social Sciences for analysis.
- A thorough analysis of the data was undertaken to reach findings and conclusions that address the survey's main questions, as defined in the survey's objectives.

1.3.4 Focus Group Discussions

Twelve focus groups of consumers for different consumer sectors were organized in the north, center and south of the West Bank and Gaza Strip. These groups reflected on the issues pertinent to food safety KAP and allowed Al Marqaz to assess qualitative attributes relevant to food safety. The findings of these focus groups were incorporated into the quantitative analysis.

1.3.5 Survey results presentation and discussion workshop

A multi-stakeholder consultation workshop was conducted[1] with the participation of food safety experts from all related ministries (MoA, MoH, MoNE, PSI), consumer protection associations and the Food Industry Union (FIU) as well as relevant FAO staff. The survey findings and recommendations regarding consumers' food safety KAP were presented by Al-Markaz Consultants. The participants discussed the gaps in KAP among the consumer households and discussed/suggested recommendations related to the awareness campaigns and the communication approaches to bridge gaps in consumers' knowledge and practices. The report was finalized based on the discussions and suggested recommendations.

1.3.6 Reporting

Survey results are presented in this report across four main sections. This section (Section 1) provides an outline of survey objectives and methodology. Section 2 details survey findings on the socio-economic profile of households. Section 3 outlines survey findings related to food safety KAP. Section 4 provides conclusions and recommends communication strategies to improve consumers' awareness of food safety and create positive change in their attitudes to food safety best practices.

1. This consultation workshop was conducted on 3 August 2017

SECTION 2

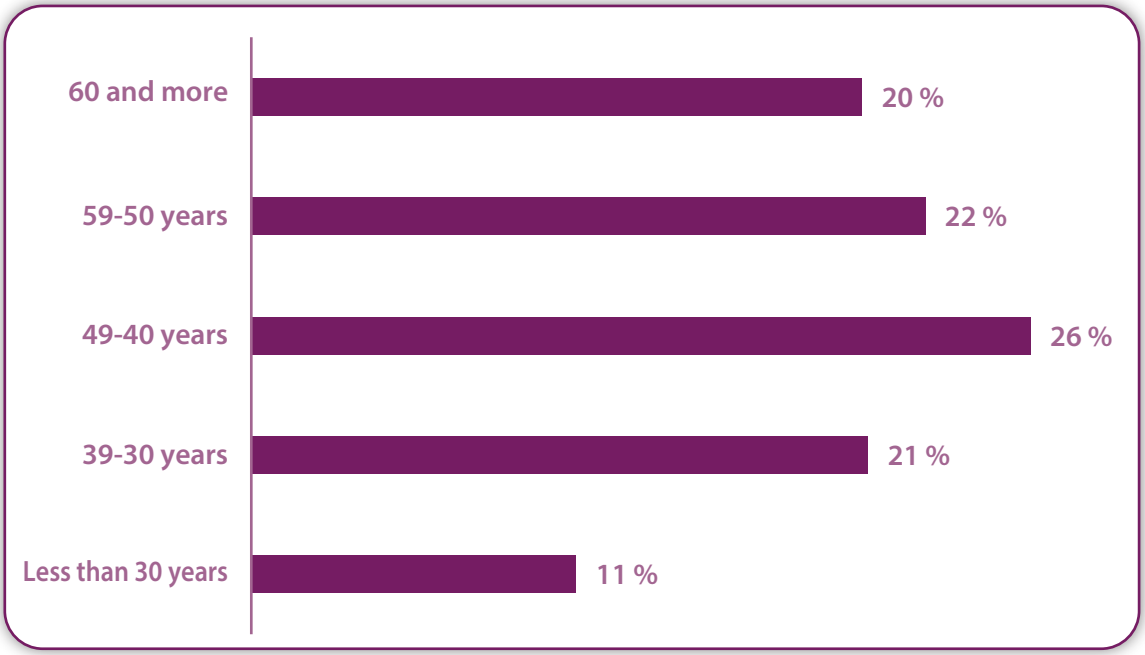
SOCIOECONOMIC PROFILE OF RESPONDENTS

2.1 Demographic profile of household heads

2.1.1 Gender and age distribution of household heads

The survey found that a majority 89.1 percent of households are headed by males, compared to 10.9 percent headed by a female.[2] At the time of the survey, the age distribution of household heads ranged from 21 to 95, while the majority of households heads 66 percent are aged 30 years or more (see Figure 1 below).

Figure 1: Age Distribution of Household heads



In the data and analysis that follow, female and male heads of household are grouped together as 'head of household.' However, as female heads of household are assumed to be without a partner for the purposes of this study, the category of partner refers only to the partners of male heads of household.

2.1.2 Education levels of household heads and their partner

The majority 55.5 percent of the sampled household heads held less than secondary-level education; among them 28.2 percent have completed only elementary education or less, while 9.1 percent are illiterate (see Table 2 below).

Table 2: Level of education attained by household heads and their partner

Educational attainment	Household heads (%)	Partners (%)
Illiterate (can't read or write)	9.1	7.7
Elementary	19.1	14.8
Preparatory	27.3	27.5
Secondary	23.3	23.7
Diploma and above	21.2	26.3

2. For the purposes of this study a female headed household is any household where the female is either a widower, divorced, never married or otherwise required to act as the sole household decision-maker.

To compare with the national level, the PCBS statistics show that 79.5 percent of household heads hold less than a diploma, while 33.3 percent have only completed elementary-level education or less, and 14.1 percent are illiterate (cannot read or write)[3].

2.1.3 Employment status of household heads and their partner[4]

Out of the total sample, 22.8 percent of household heads reported that they are not part of the labor force 77.2 percent are part of the labor force, while 84.6 percent of partners are not part of the labor force 15.4 percent are part of the labor force. The main occupations practiced by employed household heads include crafts and related trades, professionals, technicians, services, sales, market vendors and elementary work. For working partners, about 60 percent work in professional jobs (teachers, nurses and so on) or as technicians. Table 3 below summarizes the main findings.

Table 3: Primary occupation of household heads

Occupation	Primary occupation of employed household heads (%)
Legislators, Managers	2.6
Professionals and technicians	16.1
Clerks and secretarial	1.4
Services, sales and market vendors	15.7
Skilled agricultural and fishery workers	5.4
Crafts and related trade workers	24.3
Plant and machine operators/ assemblers	8.5
Elementary occupations	15.4
Security forces	10.5
Total:	100

More than 12 percent of household heads who are part of the labor force reported being unemployed, as did 39.4 percent of partners (see Table 4).

Table 4: Unemployment rates of economically-active household heads and their partner

Status	Employment status of economically-active household heads (%)	Employment status of economically-active partners (%)
Employed	87.4	60.6
Unemployed	12.6	39.4
Total:	100	100

In comparison with the national level, PCBS statistics show that 14.3 percent of household heads who are part of the labor force reported being unemployed, as did 33.2 percent of partners who are part of the labor force[5].

3. PCBS, Labor Force Survey, 2015
4. Almost all of the female household heads are either widowed, divorced, or have never been married; while almost all of the male-headed households have female partners.
5. PCBS, Labor Force Survey, 2015.

2.2 Characteristics of respondent households

2.2.1 Household size

The survey findings show that the average household size is 5.5 (4.9 in WB, 6.6 in Gaza). The percentage distribution of households with respect to size is shown in Table 5 below.

Table 5: Distribution of households by size (West Bank and Gaza Strip)

Household Size	West bank (%)	Gaza strip (%)	All regions (%)	PCBS statistics (%)
Less than 3 members	30.4	12.4	24.5	23.6
3-4	16.6	10.5	14.6	12.2
5-7	38	42	39.3	44
8-10	13.6	28.3	18.4	17.5
More than 10	1.4	6.7	3.2	2.7
Total:	100	100	100	100

As detailed in the above table, household size is relatively large in the Gaza Strip as well as the north and south West Bank.

2.2.2 Age distribution of household members

More than 41.3 percent of households members are less than 18 years of age, while 5.8 percent are over 60 (Table 6).

Table 6: Age distribution of consumer household members

Age group	Distribution (%)
0–4 years	10.4
5– 9 years	11.1
10–14 years	12.6
15–17 years	7.2
18–59 years	52.8
60+ years	5.8
Total:	100

2.2.3 Household members' education

65.2 percent of households have at least one member who is enrolled in basic or secondary education. Table 7 below details the percentage distribution of households with respect to the number of members enrolled in schools.

Table 7: Distribution of households by the number of members enrolled in school

Number of household members enrolled in school	Percentage of households (%)
0	34.9
1	15.9
2	14.5
3	14.1
4	10.3
More than 4	10.2
Total:	100

Table 7 suggests that communications through schools are likely to have a strong influence on a significant number of Palestinians, as 65.1 percent of households have at least one family member enrolled in school.

2.2.4 Household members' employment

Survey results show that the economic participation rate is 72.4 percent among males; of those 23.5 percent were unemployed at the time of the survey. The female economic participation rate is 17.7 percent, while 44.9 percent of economically-active females were unemployed at the time of the survey.

Survey findings also show that 69.5 percent of households do not have unemployed members, while 20.6 percent have one unemployed member. Only 9.8 percent of households have 2 or more unemployed members. This occupation of the employed persons is detailed in Table 8 below.

Table 8: Primary occupation of employed household members

Occupation	Primary occupation of employed household members (%)
Legislators, Managers	1.5
Professionals and technicians	17.9
Clerks and secretarial	3.4
Services, sales and market vendors	19.7
Skilled agricultural and fishery workers	4.1
Crafts and related trade workers	27.7
Plant and machine operators and assemblers	5.7
Elementary occupations	12.5
Security forces	7.6
Total:	100

2.2.5 Household income

Noting the tendency of respondents to understate their income, the survey reveals that the average income of surveyed households is 2 728 NIS (3 250 NIS in WB, while in Gaza 1 606 NIS). Survey findings show that 52 percent of households have a monthly income that is less than 2 500 NIS; while 7.9 percent of households have a monthly income in excess of 5 500 NIS (see Table 9 below).

Table 9: Monthly household income

Income groups (NIS)	Percentage of households in each income category							
	Main regions				Type of locality			
	North WB (%)	Central WB (%)	South WB (%)	Gaza (%)	Urban (%)	Rural (%)	Refugee camps (%)	Overall (%)
Up to 2,500	48.6	36.1	41.8	78.2	52.3	47.8	60.2	52.0
2,501-3,500	22.6	16.8	28.1	15.1	19.6	20.9	19.6	20.1
3,501-4,500	14.7	16.8	10.5	3.2	10.5	15.1	7.2	11.6
4,501-5,500	9.2	13.5	9.8	1.6	9.2	8.7	5.4	8.4
More than 5,500	4.9	16.8	9.8	1.9	8.4	7.7	7.2	7.9
Total	100	100	100	100	100	100	100	100

The above table shows household income in the Gaza Strip is relatively low in comparison to the West Bank, while the North and South West Bank have lower income levels than the Central West Bank. Most households do not gain sufficient income. According to PCBS, the average monthly consumption of a standard household is 5 290 NIS (1058.4 JD) in the West Bank, and 3 647 NIS (729.3 JD) in the Gaza Strip.[6].

These household consumption figures includes three categories of consumption – home - produced foods; food items directly purchased by households; and food items provided to households as humanitarian assistance.[7]

6 Expenditure and consumption survey, PCBS, 2011

7. The survey was designed to reflect the households' practices rather than the practices of each household member. Accordingly, the field researchers were instructed to ask about the practices of the household member who usually handles food preparation inside the households. Most of the respondents were female household members.

SECTION 3

FOOD SAFETY KNOWLEDGE, ATTITUDES, AND PRACTICES

3.1 Purchasing phase

A main source of risk concerning the quality and safety of food can be found in consumers' purchasing practices. This relates to how consumers purchase, store and transport their food; and the extent to which sellers adhere to appropriate food safety procedures in their stores.

To ascertain the measures that were adopted by consumers to minimize risks to the quality and safety of the food items that they have purchased, respondents were asked about:

- Whether they purchase foods from known (trusted) sources
- Their knowledge and practices regarding the location of food stores and the time needed to access them
- Their knowledge of appropriate storage procedures in food stores
- Whether food safety issues are a concern during purchasing

Survey findings are presented in the following sub-sections.

3.1.1 Chilled/ refrigerated foods

The KAP survey covered four main chilled food groups that must be refrigerated to ensure their quality and microbiological safety at points of sale. Survey findings indicate that almost all West Bank households consume these four food items, however the situation is markedly different in the Gaza Strip, as illustrated in the following table.

Table 10: Distribution of households not purchasing chilled/refrigerated food items

Food items	North WB (%)	Central WB (%)	South WB (%)	Gaza Strip (%)	Country-wide (%)
Fresh meat	2.6	0.8	6.5	52	19
Fish	2.9	3.3	5.3	43.1	16.5
Chicken	0	0	0	6.7	2.2
Frozen foods	2.6	4.5	5.3	13.7	7.1

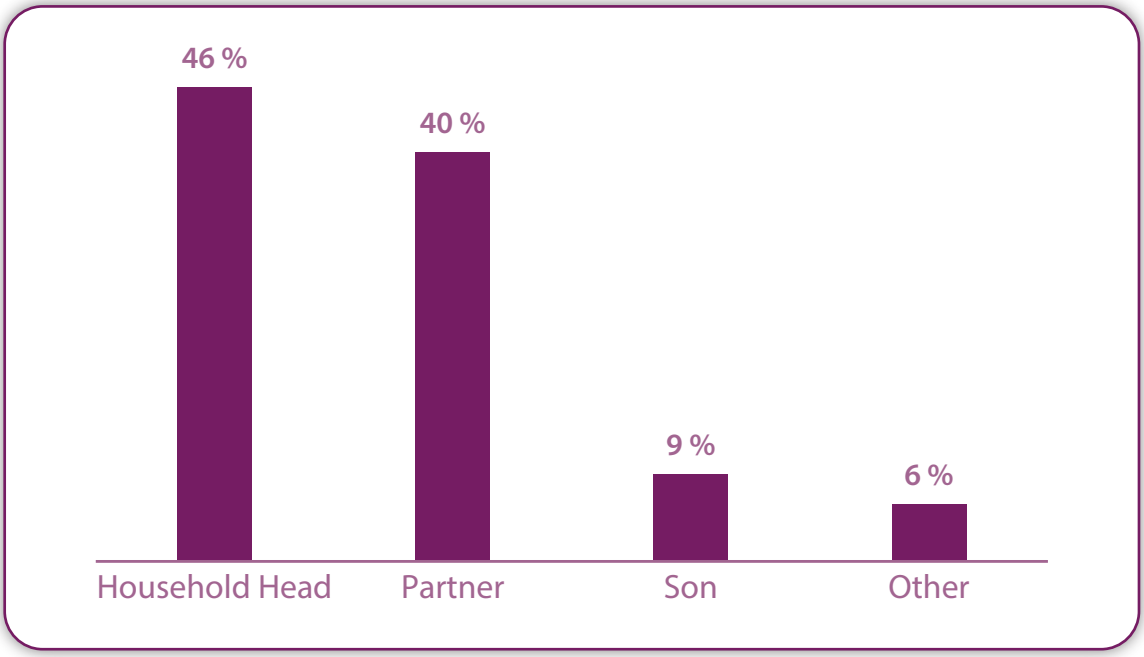
The above table shows that about 52 percent of households in the Gaza Strip do not purchase fresh meat. Instead, frozen meat is purchased as an affordable substitute. Furthermore, a significant portion of Gazan households do not purchase fish, due to supply shortages across the year. The supply of fish is very limited and expensive, except in April-May when the supply of fish (sardines) increases - most households consume fish during these two months.[8]

Who does the p urchasing?

Survey results show that for 46 percent of households, the purchase of chilled/ refrigerated food items is performed by the household head, with 40 percent indicating that these items are purchased by the spouse of the household head.

8. Note that the survey was conducted in February.

Figure 2: Distribution of households according to who purchases chilled/refrigerated foods



As can be observed from the figure above, household heads and their partners are the primary family members who purchase chilled/refrigerated food items. Even if other family members perform this chore, they are expected to obtain the advice and approval of their parents regarding what quantity/quality to buy, and from which outlet.

3.1.1.1 Knowledge and practices regarding source, location and time required to purchase and store chilled/refrigerated foods

The survey findings show that the majority of consumers who consume these food items purchase them from a fixed source, as shown in the following table:

Table 11: Fixed store purc hases of chilled/ refrigerated foods

Food items	Do you buy from a fixed store?					
	Always/ often		Rarely		No	
	WB (%)	Gaza (%)	WB (%)	Gaza (%)	WB (%)	Gaza (%)
Fresh Meat	75.8	83.7	4.5	7.3	19.7	9
Fish	77.8	55.5	8.5	10.9	13.7	33.6
Chicken	77.3	72	4.6	9	18.1	19.1
Frozen Foods	78.7	75.3	7.5	8.8	13.8	15.9

The above table shows that most households buy these food items from the same source, with some variance between the West Bank and the Gaza Strip.

Although some households may buy from different sources, the majority of households buy meat, chicken, fish and frozen foods from specialized stores, as illustrated below:

Table 12: Distribution of households with respect to type of retail outlet

Type of retail outlet	Fresh meat			Fish			Chicken			Frozen food		
	WB (%)	GS (%)	PA (%)	WB (%)	GS (%)	PA (%)	WB (%)	GS (%)	PA (%)	WB (%)	GS (%)	PA (%)
Supermarket/ grocery	6.9	2.2	6	31.7	0.5	24.7	11.9	2.6	9.0	63.1	8.2	46.4
Butcher	89.5	95.5	90.6	6.4	0.5	5.1	5.1	0	3.5	6.1	0.9	4.6
Fishmonger	0.1	0.6	0.2	38	68.7	44.9	0.1	0	0.1	0.3	0	0.2
Frozen foods' shop	2.4	0	2	18.2	0	14.1	5.5	0.9	4.1	23.5	89.3	43.5
Street vendors	0	0	0	0.1	5.2	1.3	0.1	0.3	0.2	0.1	0	0.1
Chicken shop	0.7	0	0.5	5.1	0.57	4.0	74.9	96	81.5	6.4	1.3	4.9
Neighbors/ friends	0	1.7	0.3	0	3.8	0.8	0.3	0.2	0.3	0	0.3	0.1
Others	0.4	0	0.4	0.5	20.8	5.1	2.1	0	1.3	0.5	0	0.2
Total	100	100	100	100	100	100	100	100	100	100	100	100

The above table shows that the majority of households buy meat, chicken, fish and frozen foods from specialized stores, while a significant number buy from 'mixed' stores that sell various types of food.

Moreover, survey results show that when purchasing chilled/refrigerated food items, the clear majority of household heads and their partner buy from one fixed location.

Table 13: Distribution of fixed store purchases by household member who purchases chilled/refrigerated foods

Food items	Do you buy chilled/ refrigerated foods from a fixed (known) store?					
	Always/ often			Rarely/ no		
	Household head (%)	Partner (%)	Others (%)	Household head (%)	Partner (%)	Others (%)
Fresh meat	73.4	79.5	83.2	26.6	20.5	16.8
Fish	66.7	79.7	71.2	33.3	20.3	28.8
Chicken	72.5	77.8	79.9	27.5	22.2	20.1
Frozen foods	72.1	83.3	79.6	27.9	16.7	20.4

Focus group discussions revealed that some consumers buy from a known (fixed) source as they believe that such retail outlets have a good reputation and can be trusted to source high-quality food. In the Nablus focus group specifically, several participants explained that they prefer to buy from the same trustworthy store, as this allows them to build a strong relationship with the seller who will have more incentive to satisfy their needs given that they are loyal customers. Additionally, some of the respondents who buy from a known (fixed) source are of the opinion that their vendor sources high-quality produce, applies rigorous hygiene procedures and provides good customer care. In the Hebron focus group, some participants explained that prior knowledge of the source gives them a feeling of safety, even if food items are purchased over the phone.

Other participants (in the Ramallah, Nablus, Gaza and Hebron focus groups), who tend to buy from different retail outlets, indicated that they buy from multiple sources as they cannot locate one single source to satisfy all their consumption needs. Several participants indicated that they prefer to keep their options open: buying from multiple sellers allows them to examine differing qualities and prices offered by different vendors, while benefiting from savings when certain vendors run sale offers. This also allows them to compare products offered by various shops and bargain for better prices. A participant in Beitunia indicated that he seeks the best food products from different sources for these reasons.

As for buying chicken, some participants in the Hebron focus group indicated that they tend to buy chicken from the same trusted source if it is located very close to their homes, or if the shop is managed by one of their relatives. Others in Hebron mentioned that there are no significant differences between sources, since all of them slaughter chickens that are purchased from the same farms. A significant numbers of participants in focus groups indicated that they consistently buy freshly slaughtered chicken, which they perceive to be of better quality than frozen or refrigerated chicken – these are only purchased in exceptional cases. They also buy from the same source in order to build a relationship of trust with vendors. A participant in the Bethlehem focus group said that she buys from the same reliable source; another said that when looking for a reliable poultry store, the hygiene of the store is of paramount importance. Therefore, she makes sure that she sees the slaughtering process, and then the water used to wash the slaughtered chickens. In the Beitunia focus group, some participants mentioned that they buy chicken that bears the stamp of the municipal slaughterhouse.

When buying fish, most participants prefer fresh fish to frozen fish. However, some participants pointed out that frozen fish is cheaper - some families are forced to buy frozen fish as they cannot afford the price of fresh fish. Moreover, the number of retail outlets that offer fresh fish is very limited in the main West Bank cities. In the Gaza Strip however, the majority of participants indicated that they buy from different sellers due to numerous reasons: which seller has the freshest fish, the type of fish that looks most appetizing, its price, and the availability of specific types of fish that they are looking for (different outlets source different kinds of fish).
Several participants in village-based focus groups explained that they buy from one source as it is the only one in their locality which sells meat or chicken or fish. For example, in Haja village, participants mentioned that there is only one store selling meat in the village, and it is considered reliable by almost all residents as it slaughters the animals and follows good hygienic practices. In Beit Rush village, some participants explained that they tend to select one source as this allows them to buy on credit.

Even in the cities, there could be a limited number of stores that sell specific food items. For example, participants in Nablus explained that there are only two stores that sell fresh fish, as is the case with Ramallah and Hebron.

In Askar refugee camp, focus group participants indicated that they believe that it is better to buy food from one clean store, where health and safety measures are reliable. Many emphasized that stores should be carefully selected, as some sell meat with little attention to health and safety measures. For example, a woman mentioned an incident where she saw a cat in a butchery eating leftover meat on one of the counters, while the butcher was busy outside the store.

The same issues were mentioned in Gaza focus groups: most participants indicated that they buy fresh meat from the same source because they trust its cleanliness.

Few participants in various focus groups indicated that they buy from a variety of sources. The main reason is that they go to a market which is not in their area of residence, and buy from a shop that they find suitable. Yet, if a new meat shop opens close to their homes, they start to buy from this shop. With regards to chicken, participants indicated that they buy live chicken from different sources, for price reasons (they buy from the one offering the lowest prices), and according to the look of the chicken. They said that they buy from sellers whose chickens look good and healthy, others mentioned that they are more concerned with the weight of the chicken. A participant buys from a seller who has chickens with the required weight. As for buying fresh fish, a significant number of participants indicated that they feel it is best to buy from different sources, always looking for the freshest fish.

Finally, for frozen products, almost all the same factors are mentioned. Participants buy from a seller who has a good reputation, who sources quality products and has high product turnover (i.e. products are not stored for a long time). Additionally, across all focus groups some participants indicated that they freeze vegetables themselves, since it is cheaper and healthier.

3.1.1.2 Knowledge and practices regarding critical time periods for storing purchased food items

Respondents were asked to report on their means of transportation when shopping for food items. The findings are shown in the following table:

Table 14: Distribution of households regarding means of transportation used in shopping

Type of transportation	Fresh meat (%)	Fish (%)	Chicken (%)	Fruits and vegetables (%)	Cans and legumes (%)	Frozen foods (%)
Private Car	23.2	22.5	18.7	18.8	18	19.4
Public transport	25.7	26.1	22.4	24	19	22.1
On Foot	46.2	46.5	53.1	51	57.9	54.8
Special Taxi	3	2.8	2.3	2.6	2.3	2.4
Others	1.1	1.5	1.3	1.5	2.6	1
Home Delivery	0.8	0.7	2.2	2.2	0.3	0.4

As the above table shows, most people walk, while a few (15-20 percent) use their private cars. Around one-half of all consumers walk to buy foods items. In the same context, respondents were asked to report on how far the shopping area is from their location, and how much time it usually takes them to go shopping. The findings are summarized in the following table:

Table 15: Distribution of households regarding distance and time to access retail outlets

	Distance/ time	Fresh meat (%)	Fish (%)	Chicken (%)	Fruits and veg. (%)	Cans and legumes (%)	Frozen food (%)
Distance from purchasing site	Up to 3 Km	82.7	80.7	86.7	85.3	87.1	85.2
	3-5 Km	8.8	10.8	8.5	8.5	8.1	8.6
	5 km +	8.5	8.5	4.9	6.3	4.8	6.2
Time elapsed between purchase and home	Less than 1 hr	71.9	71.3	74.8	65.3	72.6	74.1
	1-3 hrs	24.9	24.8	23.7	31.7	25.3	23.6
	3 hrs+	3.2	3.9	1.5	3	2.1	2.3

The main issue regarding transportation is the time that elapses between purchasing food items and reaching home (to store or cook purchased items). Taking into consideration that reaching home after shopping within an hour is generally appropriate in terms of food safety, survey findings show that the vast majority of respondents reach home within 1 hour after shopping, while a significant proportion of respondents require more than one hour to reach home (to store or process purchased food items).

In a related context, survey findings show that around 60 percent of consumers purchase meat at the end of their shopping trip, as shown in the following table:

Table 16: Distribution of households with respect to timing of food purchase during shopping

Time of purchase	Fresh meat (%)	Fish (%)	Chicken (%)	Frozen food (%)
At the start of shopping	21.8	20.9	22	20
At the end of shopping	60.4	59.6	58.8	58.1
Whenever I pass by the shop/store	11.8	13	11.9	13.5
I don't care	4.0	3.7	4.5	6.7
Others	2	2.8	2.7	1.7

In order to determine the decision-making habits of different members of households, survey findings are presented in the following table:

Table 17: Distribution of households regarding timing of chilled/ refrigerated food purchases during shopping trips, by purchaser

Time of purchase	Who does the purchasing?	Food group			
		Fresh meat (%)	Fish (%)	Chicken (%)	Frozen food (%)
At the start of shopping	Household head	21.3	21.4	22.2	19.8
	Partner	31.7	29.1	29.7	28.1
	Son/ daughter others	33.6	32.3	32.5	30.6
At the end of shopping	Household head	59.4	58	57.7	56.5
	Partner	51.3	51.9	51.5	51.4
	Son/ daughter others	51.2	50.4	50.6	49
Whenever I pass by the shop/store	Household head	15.5	16	13.8	15.6
	Partner	9.6	12	11.5	11.6
	Son/ daughter others	6.4	6.8	7.1	12.2
I don't care	Household head	2.8	2.9	4.1	7.3
	Partner	4.8	4	4.3	6.1
	Son/ daughter others	5.6	5.3	6.5	6.8
Others	Household head	1	1.7	2.2	0.8
	Partner	2.5	3	3.1	2.8
	Son/ daughter others	3.2	5.3	3.2	1.4

The above table shows that there is little difference in decision-making by household members: the majority of them purchase these food items at the end of their shopping trip.

Food storage at places of purchase

According to the WHO's recommendations, fresh meat, poultry, and fish should only be stored in refrigerators and the temperatures should be checked frequently. Especially hazardous is the range between 5°C-60°C, which represents the ideal temperatures for microorganisms to multiply at rapid rates. (WHO, 2006)

The respondents were asked about storage conditions at the shops from which they buy their food items. They were asked (unprompted) about their opinions regarding the best way of storing meat, fish, chicken and frozen foods at the stores.
Survey results are presented in the following table:

Table 18: KAP of appropriate storage conditions

Food group	Distribution of households by their perceptions and practices of appropriate storage methods				
Fresh meat	Storage method (%)	In refrigerator (%)	Hanging inside the shop, but outside refrigerator (%)	Hanging in front of the shop (%)	Others (%)
	Storage conditions at shops/ stores	51.4	38.6	9.1	1
	Perceived correct storage method (unprompted)	79.9	15.5	3.4	1.2
Fish	Storage method	In refrigerator (%)	In freezer (%)	Outside Refrigerator (%)	Others (%)
	Storage conditions at shops/ stores	33	40.8	20.7	5.5
	Perceived correct storage method (unprompted)	43.9	35.1	8.5	12.5
Chicken	Storage method	Freshly slaughtered (%)	In refrigerator (%)	Outside refrigerator (%)	Others (%)
	Storage conditions at shops/ stores	75.8	23.6	0.3	0.4
	Perceived correct storage method (unprompted)	71.6	27.9	0.2	0.4
Frozen foods	Storage method	In refrigerator (%)	In freezer (%)	Outside refrigerator (%)	Others (%)
	Storage conditions at shops/ stores	17.6	81.9	0.4	0.1
	Perceived correct storage method (unprompted)	22.5	76.4	0.2	0.9

As the above table shows, the majority of consumers have the right knowledge of storage conditions for meat, fish, chicken and frozen foods.

However, more than 20 percent of consumers believe that meat can be stored outside refrigerators, and about 21 percent believe it is possible to store fish outside the refrigerators. The situation is relatively good with regards to chicken and frozen foods.

However, in spite of the fact that consumers have the right knowledge on required food storage

conditions in retail stores, some of them buy such foods from stores that do not adhere to appropriate food storage methods. When respondents were asked about storage conditions at shops and retail outlets, results show that 47.7 percent of consumers buy meat that is hanging outside the refrigerator (inside or outside the shop) and 8.5 percent of consumers buy fish that is stored outside a refrigerator or freezer. For chicken and frozen foods, the situation is less risky as can be observed in the above table.
The tables below present survey findings regarding household members' perceptions on correct storage conditions at shops from which they purchase fresh meat and chicken.

Table 19: Perceptions of appropriate storage conditions for fresh meat, by purchaser

Storage conditions at shops/ stores	Who does the purchasing?			Total (%)
	Household head (%)	Partner (%)	Others (%)	
In refrigerator	43	59.6	52	51.3
Hanging inside the shop, but outside refrigerator	44.5	33.2	36.8	38.6
Hanging in front of the shop	11.8	5.9	10.4	9.1
Others	0.8	1.3	0.8	1
Total	100	100	100	100
Perceptions of correct storage methods (unprompted)				
In refrigerator	75	82.7	81.9	79.1
Hanging inside the shop, but outside refrigerator	18.5	14.6	15	16.4
Hanging in front of the shop	5.2	1.3	2.5	3.3
Others	1.3	1.3	0.6	1.2
Total	100	100	100	100

Table 20: Perceptions of appropriate storage conditions for chicken, by purchaser

Storage conditions at shops/ stores	Who does the purchasing?			Total (%)
	Household head (%)	Partner (%)	Other (%)	
Freshly slaughtered	79.2	72.4	74.7	75.8
In refrigerator	20.8	26.5	24	23.6
Outside refrigerator		0.4	0.6	0.3
Others		0.7	0.6	0.4
Total	100	100	100	100
Perceptions of correct storage methods (unprompted)				
Freshly slaughtered	76.7	65.7	70.6	71.5
In refrigerator	23.1	33.2	29.4	28
Outside refrigerator	0.2	0.2		0.2
Others		0.9		0.4
Total	100	100	100	100

3.1.1.4 Knowledge and practices of the health certification of fresh meat

Findings show that only 17 percent of respondents always check the stamp.

Table 21: Distribution of consumers who check health/quality verification stamps on fresh meat

Frequency	North WB (%)	Central WB (%)	South WB (%)	Gaza Strip (%)	Country-wide (%)
Always	13.6	15.4	11.3	30.9	17.0
Sometimes	18.1	11	7.5	18.5	14.4
Never	51	58.5	63.8	49.4	54.9
No stamps on meat	17.2	15	17.5	1.1	13.6
Total	100	100	100	100	100

Table 22: Distribution of consumers who check health/quality verification stamps on fresh meat, by the level of education of household heads and partner

Responses	% of responses segmented by level of education of household head		% of responses segmented by level of education of partner		Total (%)
	Less than secondary (%)	Secondary and above (%)	Less than secondary (%)	Secondary and above (%)	
Yes	27.3	30.8	29.8	26.5	17
No/Don't Care	72.7	69.2	70.2	73.5	14.4
Never	54.7	55.3	0	0	54.9
No stamps on meat	14.6	12.4	0	0	13.6
Total	100	100	100	100	100

Among those who responded that they do check the stamp, only a few of them recognize the meaning of different types of stamps on meat that they have purchased.

3.1.1.5 Attitudes towards purchasing inappropriately stored food items

It must be noted that it is not easy to distinguish between practice and attitude, since peoples' attitudes are strongly correlated to their knowledge and practices on the one hand, and their health awareness on the other. Bearing this in mind, attitudes are examined through the indicators detailed below.

When respondents were asked whether they would be willing to buy food items that are not stored appropriately, the survey returned the findings summarized in the following tables (23-27):

Table 23: Consumers willing to purchase inappropriately stored meat (outside refrigerator)

Responses	Region		Type of Locality			
	WB (%)	Gaza (%)	Urban (%)	Rural (%)	Camp (%)	Country-wide (%)
Yes	21.2	76.8	31.7	28.4	40.9	32
No	76.5	23.2	67.4	68.4	57.7	66.2
Don't care	2.3	0.0	0.9	3.3	1.3	1.9
Total	100	100	100	100	100	100

Table 24: Distribution of consumers willing to purchase inappropriately stored meat (outside the refrigerator) by the level of education of household heads and partner

Responses	% of responses segmented by level of education of household head		% of responses segmented by level of education of partner	
	Less than secondary (%)	Secondary and above (%)	Less than secondary (%)	Secondary and above (%)
Yes	27.3	30.8	29.8	26.5
No	72.7	69.2	70.2	73.5
Total	100	100	100	100

Table 25: Consumers willing to purchase inappropriately stored frozen-fish (outside freezer, or no ice)

Responses	Region		Type of Locality			
	WB (%)	Gaza (%)	Urban (%)	Rural (%)	Camp (%)	Country-wide (%)
Yes	3.8	5	3.5	4.8	4.9	4.2
No	95.35	93.7	95.5	94.1	94.6	94.8
Don't care	0.8	1.3	1	1.1	0.5	1
Total	100	100	100	100	100	100

Table 26: Distribution of consumers willing to purchase inappropriately stored frozen fish (outside freezer or stored without ice) segmented by the level of education of household heads and partner

Responses	% of responses segmented by level of education of household head		% of responses segmented by level of education of partner	
	Less than secondary (%)	Secondary and above (%)	Less than secondary (%)	Secondary and above (%)
Yes	2.7	4.3	4.1	3.2
No	97.3	95.5	95.9	96.8
Total	100	100	100	100

Table 27: Distribution of consumers willing to purchase inappropriately stored fresh fish (outside refrigerator/ or stored without ice)

Responses	Region		Type of Locality			
	WB (%)	Gaza (%)	Urban (%)	Rural (%)	Camp (%)	Country-wide (%)
Yes	6.3	39.3	15.1	6.2	25.1	13.92
No	93.3	60.7	84.7	93.5	74.3	85.7
Don't care	0.4	0	0.2	0.3	0.6	0.3
Total	100	100	100	100	100	100

As can be observed from the above tables, consumers in Gaza tend to be more concerned with storage conditions when buying fish relative to buying fresh meat. In the West Bank, the findings show that consumers are equally concerned with storage conditions when buying fish and meat.

In focus group discussions on these issues, participants agreed that there is insufficient public awareness, as many suppliers do not publicize the food safety measures that they follow. Focus group participants in Hebron explained that even if consumers try to assess food safety and quality through observation, they are often unable to determine whether the supplier is safe or not. In Asker refugee camp, participants explained that storage methods are generally unsafe and unhealthy, as most stores do not preserve foods at the proper temperature for each kind of food, but rather store them all in one place at one temperature. Some vendors tend to turn off refrigerators for short periods of time in order to save electricity, which can affect the quality of food products. In the Beitunia focus group, some participants indicated that they recognize the quality of refrigerated foods from their color and smell, as well as through the refrigerators and air conditioners that the store uses.

A participant said that many stores separate foods, but not wholesalers who neglect order and cleanliness in their stores. She also said that some people pay more attention to the price of food than the quality of these products.

In some cases, the Ministry performs inspections, but these are not frequent enough to cover the entire markets for time spent shopping, most participants seem to be aware of the need to buy meat while minimizing the amount of time that the meat spends outside refrigeration. Therefore, they either buy them at the end of their shopping, or store them in a fridge until they have completed their shopping.

As can be concluded from all focus groups, in general, the time required to visit (access) shopping locations is reasonable, if these are in the same village or in adjacent towns. The same is true in refugee camps and cities, since most participants purchase their goods locally. When shopping in the city, they purchase meat last before commuting back to their village, as is the case in Haja. Under normal conditions, the time required for travel is short enough to ensure that meat does not spoil; however, extended stoppages at Israeli checkpoints could result in meat not being stored within acceptable time spans. In the Qalandia focus group, some participants spend around two hours shopping for food: they buy vegetables first and meat last in order to preserve food from spoiling. Some participants pointed out that they insert ice-cubes in packages when buying fish.

Several focus group participants in Askar refugee camp explained that they buy meat, fish and chicken at the end of their shopping trip, as these are more prone to spoilage if they are not

stored quickly and properly. Usually, they place such items on car seats or floors, but not in car-boots to avoid their exposure to high heat, which can damage the food items. Most participants indicated that shopping takes one to two hours, but for those who do not have private cars, they face the problem of limited transportation. Some participants buy food items during a specially-timed shopping trip. For example, a participant in the Beitunia focus group mentioned that she assigns a specific day for buying meat and fish only, and performs the shopping trip during the hours when the temperature is not very high.

The same behaviors apply to Gaza. Participants explained that generally, they spend 1-2 hours at the market. First, they buy vegetables and fruits, then meat and chicken, and then fish. The last items they buy are frozen products. Thus, they keep the meat, chicken, fish and frozen products in good condition until they reach home.

3.1.2 Fresh dairy products

The KAP survey included domestic dairy products that are typically handled by farmers and consumers outside retail stores.

The survey findings show that about 48.1 percent of surveyed households - always or sometimes - buy fresh dairy products from farmers/herders, as shown in the following table.

Table 28: Distribution of households purchasing fresh dairy products by locality type

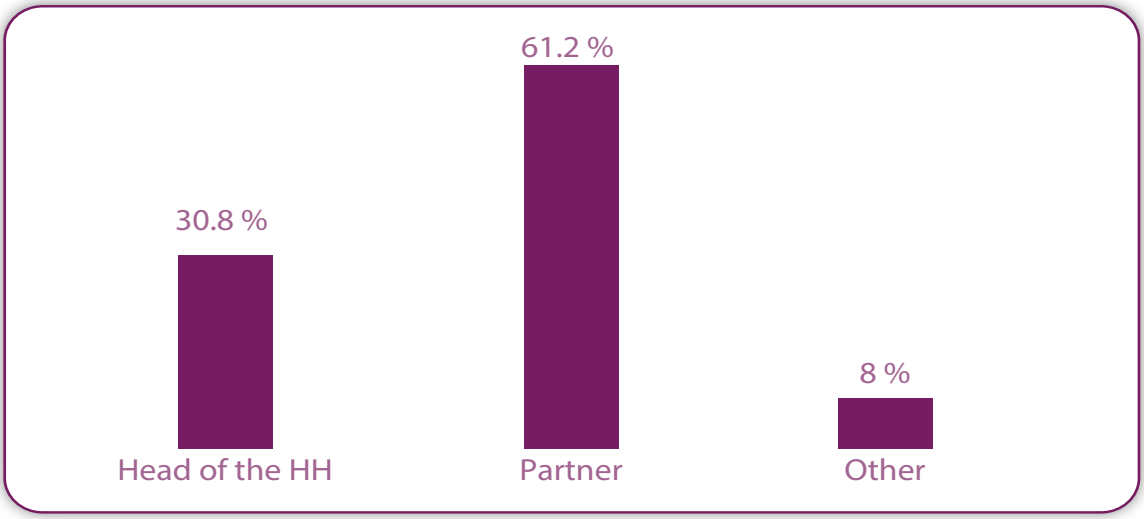
Do you purchase fresh dairy products?	Urban (%)	Rural (%)	Refugee Camps (%)	Overall (%)
Yes	44.2	54.8	45.1	48.1
Rarely	7.1	8.2	8.8	7.8
No	48.7	37.1	46.1	44.1
Total	100	100	100	100

A About half of the households 48.6 percent do not purchase fresh dairy products, while about 64.7 percent of households in North WB purchase fresh dairy products, while less than one-third of households in Gaza purchase fresh dairy products (see table below).

Table 29: Distribution of households purchasing fresh dairy products by region

Do you purchase fresh dairy products?	North WB (%)	Central WB (%)	South WB (%)	Gaza (%)	Overall (%)
Yes	64.7	60.4	43.1	23.8	48.1
Rarely	8.3	5.5	13.8	6	7.8
No	27	34	43.1	70.2	44.1
Total	100	100	100	100	100

Figure 3: Distribution of households by member purchasing fresh dairy products

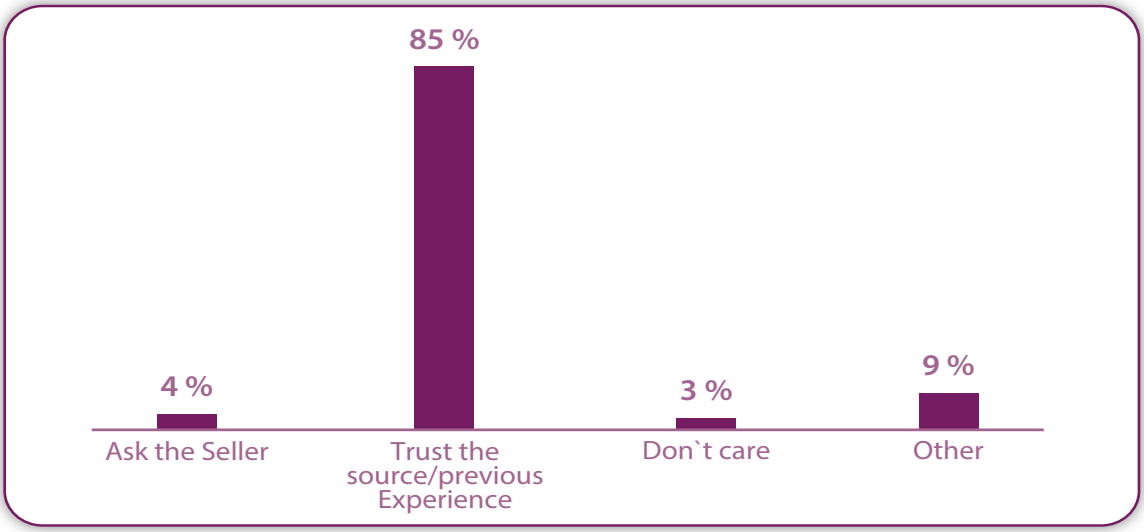


Partners are mainly responsible for purchasing fresh dairy products, while a significant portion of household heads are responsible for purchasing fresh dairy products.

3.1.2.1 Knowledge and practices with respect to the health and safety of fresh diary items

With respect to the type of containers/packages that are used to deliver fresh dairy products, survey findings show that 51.1 percent of households check the safety of these containers/ packages. Furthermore, survey findings show that the majority of consumers who do purchase fresh dairy products do not have a proper inspection mechanism to ensure the safety of these products, as shown in the following figure:

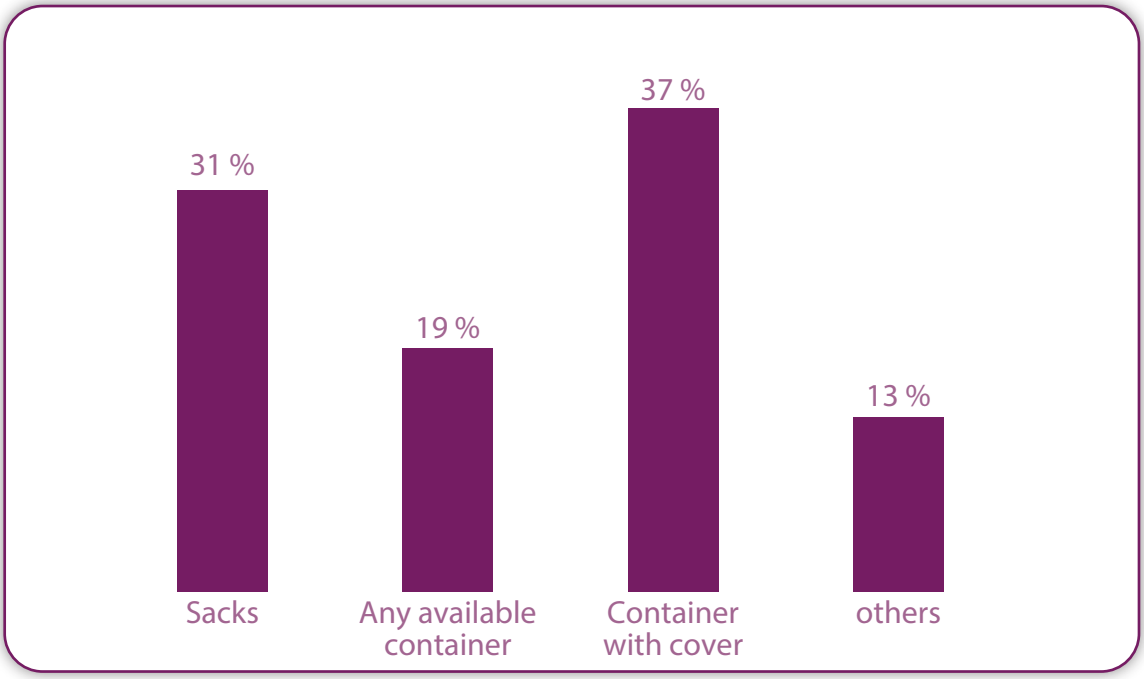
Figure 4: Distribution of households applying safety measures when purchasing dairy products



As illustrated above, amongst those who buy fresh dairy products from farmers, about half of them do not check product safety, with 85 percent indicating that trusting the supplier or having a good experience with them (ease of transaction) is sufficient.

With respect to the type of packages that are used to deliver fresh dairy products, survey findings are outlined in the figure below:

Figure 5: Distribution of households with respect to the type of packaging



Around 35 percent are using inappropriate containers/packages such as random plastic bottles, while almost half of the surveyed consumers 48.9 percent do not check the safety of containers/ packages used to store these products. Furthermore, 39.7 percent mentioned that when purchasing these products, the supplier keeps these products outside a refrigerator, with a further 12.1 percent indicating that they do not know where the supplier keeps such products.

3.1.2.2 Knowledge and practice of safety of manufactured/pasteurized dairy products

Survey findings show that the majority of households have a positive attitude in that they check the production and expiry dates of the pasteurized dairy products, as shown in the tables below:

Table 30: Households' attitudes to safety pasteurized dairy products

Do you believe that it is necessary to check the expiry dates of pasteurized dairy products?	Urban (%)	Rural (%)	Camp (%)	Overall (%)
Yes	96.7	95.3	98.9	96.6
No	1.9	3.5	1.1	2.3
Don't care	1.4	1.2		1.1

Table 31: Household practices regardinz safety pasteurized dairy products

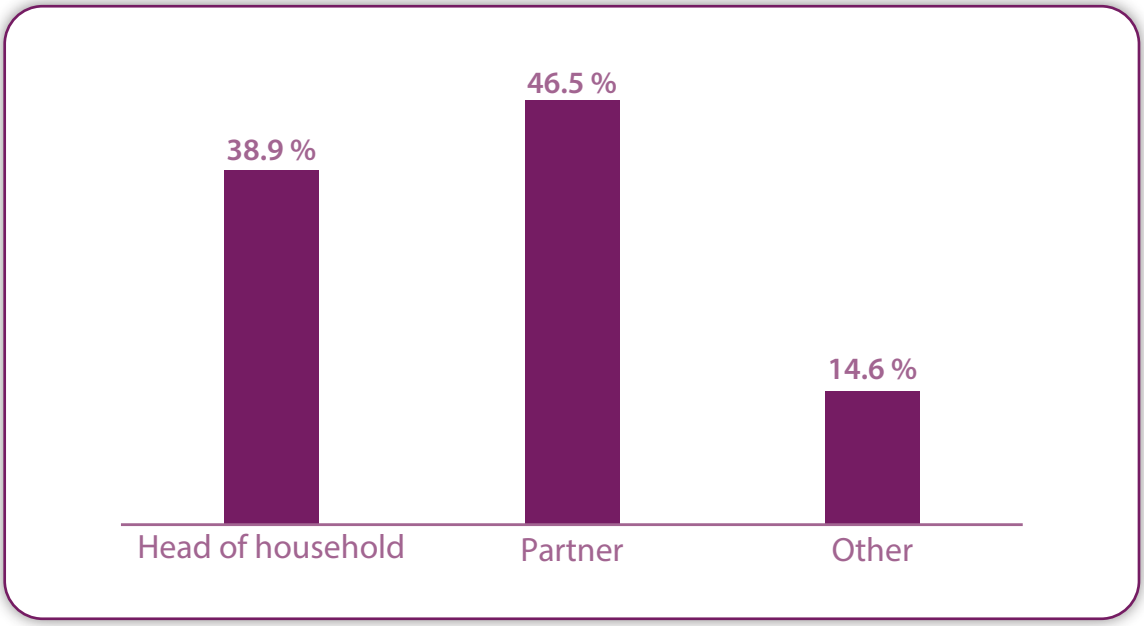
Do you check the expiry dates of pasteurized dairy products?	Urban (%)	Rural (%)	Camp (%)	Overall (%)
Yes	83.8	82.6	80.1	83.5
No	10.7	11	18.3	11
Don't care	2.9	3.7	1.3	2.9

While 93.3 percent of surveyed households said that it is important to check the production and expiry date of pasteurized milk and milk products, only 83.5 percent regularly undertook this action.

3.1.3 Canned and dried products

Survey findings show that household heads and their partner are the main family members who are responsible for purchasing dried and canned products, as shown in the following figure:

Figure 6: Distribution of household by member purchasing canned and dried products



3.1.3.1 Knowledge and practice on safety measures of the canned and dried products

Respondents were asked to report on their knowledge and practices with respect to canned and dried food. Survey findings are illustrated in the following tables:

Table 32: Distribution of households' attitudes towards checking expiry dates of canned/ dried foods

Do you believe that it is necessary to check the expiry dates of canned/ dried foods?	Packaged food (%)	Canned food (%)	Dried food (legumes) (%)	Frozen food (%)
Yes	92.3	93.2	65.1	83.1
No	4.2	1.2	19	3.8
Don't care	2.6	1.7	11.6	3
Don't purchase these products	0.9	3.9	4.3	10.1

Table 33: Distribution of households checking expiry dates of canned/ dried foods

Do you check the expiry dates of canned/dried foods?	Packaged food (%)	Canned food (%)	Dried food (legumes) (%)	Frozen food (%)
Always	73.4	76.9	36.8	56.9
Sometimes	14	11.2	13.8	16.6
Rarely	6.1	4.5	8.7	6.4
Never	6	3.9	36.6	10.3
Others	0.5	3.	4.1	9.8

Although people believe that it is necessary to check the expiry date for most products that they buy from grocery stores, they are not putting this into practice. Legumes and grains are the least-checked for expiry: only 68.8 percent of surveyed households indicated the importance of checking such products.

Survey findings reveal that partners have better practices in checking the expiry dates of canned/ dried foods relative to other family members.

Table 34: Practices for checking expiry dates of canned/ dried foods segmented by purchaser

Food item	Do you believe it is necessary to check the expiry dates of canned/ dried foods?				Do you check the expiry dates of canned/ dried foods?			
		Household head (%)	Partner (%)	Others (%)		Household head (%)	Partner (%)	Others (%)
Packaged food	Yes	94	90.8	89.4	Always	72.1	78.5	67.9
	No	3.9	5.3	7.5	Sometimes	17.6	10.1	16
	Don't care	2.1	3.8	3.1	Rarely/No	10.3	11.4	16
Canned food	Yes	97.4	97.3	95.5	Always	78.8	84.3	72.6
	No	1.9	1.2	1.3	Sometimes	14.6	8.8	15.9
	Don't care	0.7	1.6	3.2	Rarely/No	6.6	6.9	11.5
Dried food (legumes)	Yes	72.4	73.5	68.2	Always	44.7	54.5	35.1
	No	17.5	18.5	24	Sometimes	15.8	13.8	18.8
	Don't care	10.1	8.1	7.8	Rarely/No	39.5	31.7	46.1
Frozen food	Yes	91.9	92.3	86.5	Always	61.5	73.4	58.5
	No	4.4	4.2	8.8	Sometimes	20.6	14	19
	Don't care	3.7	3.6	4.7	Rarely/No	17.9	12.6	22.4

As shown in the above mentioned table, the overwhelming majority of household heads and, when applicable, partners believe that it is necessary to check the expiry date of most products they buy from stores, although a significant number of them do not adhere to this practice. Partners generally show higher levels of adherence to checking expiry dates.

3.2 Preparation and cooking phase cooking and preparation

if not performed appropriately - are responsible for a large proportion of food-borne diseases. In order to ascertain whether consumers followed appropriate measures to minimize the risk of quality and safety of food items during preparation and cooking, respondents were asked to report on their practices with respect to cleaning, preparation, cooking and eating. Survey findings are presented in the following sub-sections.

3.2.1 KAP related to cleaning fruit and vegetables

Respondents were asked unprompted questions to describe the methods they use to clean leafy and un-leafy fruits and vegetables. Only some mentioned that they adhere to all four critical steps: separating the leaves to allow for better cleaning; soaking the leaves in water; washing the leaves with clean water; and leaving them to dry by placing them in a kitchen drainer basket. Others only mentioned that they perform two or three of the required steps, as show in the table below:

Table 35: Distribution of respondents adhering to critical steps for cleaning fruit and vegetables

How do you clean non-leafy fruits and vegetables?			How do you clean leafy vegetables?		
Method	Mentioned (%)	Not mentioned (%)	Method	Mentioned (%)	Not mentioned (%)
Soak in water	36	64	Separate leaves	76	24
Wash with running water	89	11	Soak leaves in water	66	34
Scrub well with water	75.3	24.7	Wash leaves with running water	70.7	29.3
Soak in water and vinegar	3.4	96.6	Rinse leaves and leave them to dry	79	21
Soak in sterilizing solution	0.7	99.3	Soak leaves in water and vinegar	5	95
			Soak leaves in sterilizing solution	1.2	98.8

3.2.2 Attitudes related to cleaning fruit and vegetables

When respondents were prompted to report on their attitudes in relation to following the critical steps required for cleaning fruits and vegetables, the majority reported positive attitudes in this regards, as shown in the following table:

Table 36: Distribution of respondents adhering to critical steps for cleaning fruit and vegetables

Do you believe it is necessary to clean non-leafy fruits and vegetables using these methods?				Do you believe it is necessary to clean leafy vegetables using these methods?			
Method	Necessary (%)	Not necessary (%)	Don't know (%)	Method	Necessary (%)	Not necessary (%)	Don't know (%)
Soak in water	62.6	37	0.4	Separate leaves	96	4	
Wash with running water	95.5	4.5		Soak leaves in water	83.3	16.2	0.6
Scrub well with water	93.7	5.7	0.6	Wash leaves with running water	82.1	17.9	
Soak in water and vinegar	17.3	79.5	3.2	Rinse leaves and leave them to dry	94.7	5.2	0.1
Soak in sterilizing solution	60	40		Soak leaves in water and vinegar	12.4	82.9	4.8
				Soak leaves in sterilizing solution	5.7	90.2	4.1

The survey examined whether the level of education of partners influences their practices in adhering to critical steps when washing fruit and vegetables. Findings are presented in the table below:

Table 37: Partner's perceptions of critical steps for cleaning fruit and vegetables by level of education

Partner's level of education	Percentage distribution of wives who believe that it is necessary to clean non-leafy fruits and vegetables according to the methods below:				
	Soak in water (%)	Wash with running water (%)	Scrub well with water (%)	Soak in water and vinegar (%)	Soak in sterilizing solution (%)
Less than secondary	64.8	96.2	91.9	15	6.7
Secondary and above	63.1	95.6	94.2	16.5	7.6

Partner's level of education	Percentage distribution of wives who believe that it is necessary to clean leafy vegetables according to the methods below:					
	Separate leaves (%)	Soak leaves in water (%)	Wash leaves with running water (%)	Rinse leaves and leave them to dry (%)	Soak leaves in water and vinegar (%)	Soak leaves in sterilizing solution (%)
Less than secondary	96.2	83.2	84.2	92.1	9.5	3.9
Secondary and above	94.6	84.9	86.5	95.2	11.6	4.8

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Table 38: Partner's adherence to critical steps for cleaning fruit and vegetables by education level

Partner's level of education	Partners who practice the following methods in cleaning non-leafy fruits and vegetables:				
	Soak in water (%)	Wash with running water (%)	Scrub well with water (%)	Soak in water and vinegar (%)	Soak in sterilizing solution (%)
Less than secondary	42.3	88.5	71.7	3.8	0.8
Secondary and above	38.8	89	78.7	3.4	1

Partner's level of education	Partners who practice the following methods in cleaning leafy vegetables:					
	Separate leaves (%)	Soak leaves in water (%)	Wash leaves with running water (%)	Rinse leaves and leave them to dry (%)	Soak leaves in water and vinegar (%)	Soak leaves in sterilizing solution (%)
Less than secondary	80.4	67.2	72.1	74.9	4	1
Secondary and above	72.9	68.1	74.3	82.1	5.4	0.8

As can be observed in the above two tables, a partner's education level makes little difference in the cleaning behavior of households. Instead, cleaning practices appear to be adopted without correlation to partner's education level.

3.2.3 Practices and attitudes related to thawing frozen meat and chicken

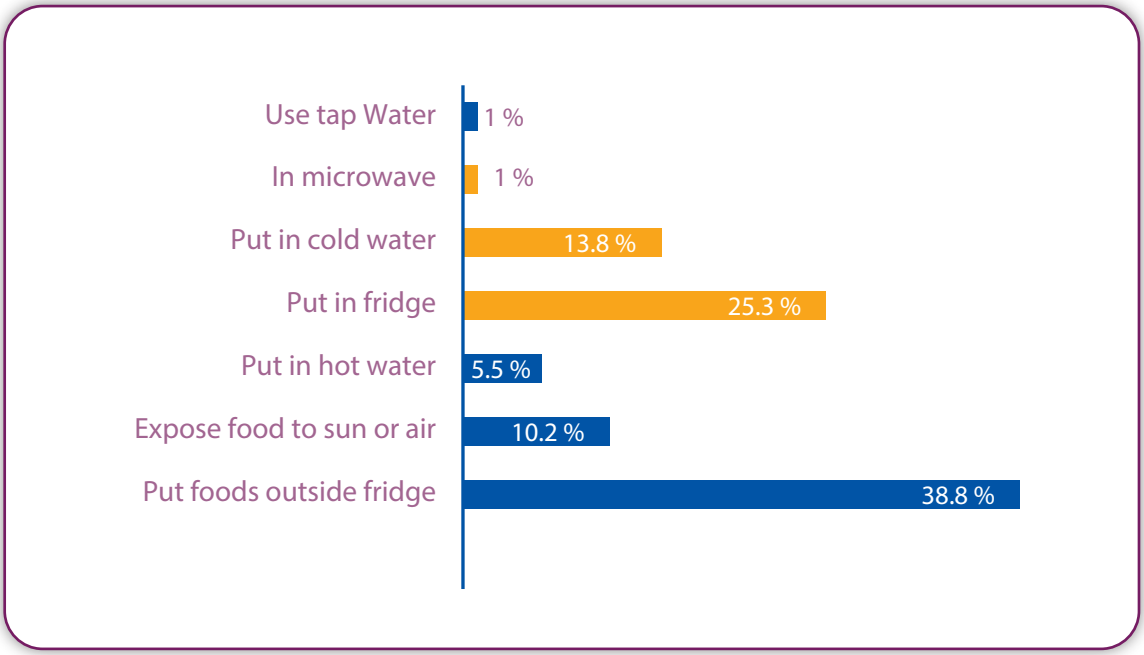
When preparing frozen foods, it is best practice to thaw the foods in the refrigerator at a constant temperature before starting the cooking process. According to the United States Department of Agriculture (USDA), the safest three ways to thaw frozen foods are thawing in the refrigerator, in cold water, and using microwaves. Perishable foods should never be thawed on the counter, or in hot water and must not be left at room temperatures where bacteria can multiply rapidly (USDA, 2013).

In the focus group discussions, some women in Bethlehem and Beit Anan village indicated that they follow the proper procedures when thawing frozen meats by placing the meat overnight in the fridge. Others, however, did not follow the proper practices and indicated that they put they put the meat outside the fridge to defrost. In the focus group in Askar refugee camp, participants indicated that they take meat/chicken out of the freezer at night and then place it in a refrigerator; in the morning they take it out for half an hour, before carving and cooking it. Lastly, they prepare the salad, as preparing it at an earlier stage will cause it to lose its nutritional value quickly and accelerate the spread of germs. Some participants stated that they place the frozen meat in boiled water, while one participant uses a microwave. Some participants in the Beitunia focus group said that they take the chicken out of the freezer for an hour, and then wash it with water and salt before cooking it. A participant indicated that during winter, she takes chicken out of the freezer and then places it in a bowl filled with water. In the summer, she puts it on the top shelf of the refrigerator instead. Another participant in the Qalandia focus group explained that she puts the frozen chicken in the refrigerator to defrost, and then washes it and marinades it with vinegar, lemon and olive oil.

In Gaza, some participants indicated that they remove frozen chicken from the freezer and place it in a container with tap water for around 10 to 15 minutes. After that, they clean the chicken, cut it with a meat knife and prepare it for cooking. Other participants in Gaza focus groups indicated that their method for thawing frozen chicken depends on whether it is winter or summer. In winter, they take the frozen chicken out of the freezer at night and put it in an empty container until the morning. Then they cut it with a special knife. If it is summer, they remove the frozen chicken from the freezer and put it in the refrigerator (the lower part) until the morning. When they wake up in the morning, they take it out of the refrigerator and prepare it in the same way.

The quantitative survey indicated that with regards to thawing frozen meat and chicken, respondents follow different practices, some of which align with recommended procedures while others do not as illustrated in Figure 7 below. Orange bars represent percentage of participants following practices aligned with international and WHO's standards on food safety, while the blue bars refer to the percentage of participants following incorrect practices (WHO, 2006).

Figure 7: Thawing procedures



To determine whether there are differences in thawing procedures practiced by employed and unemployed female partner, survey findings are summarized in the following table:

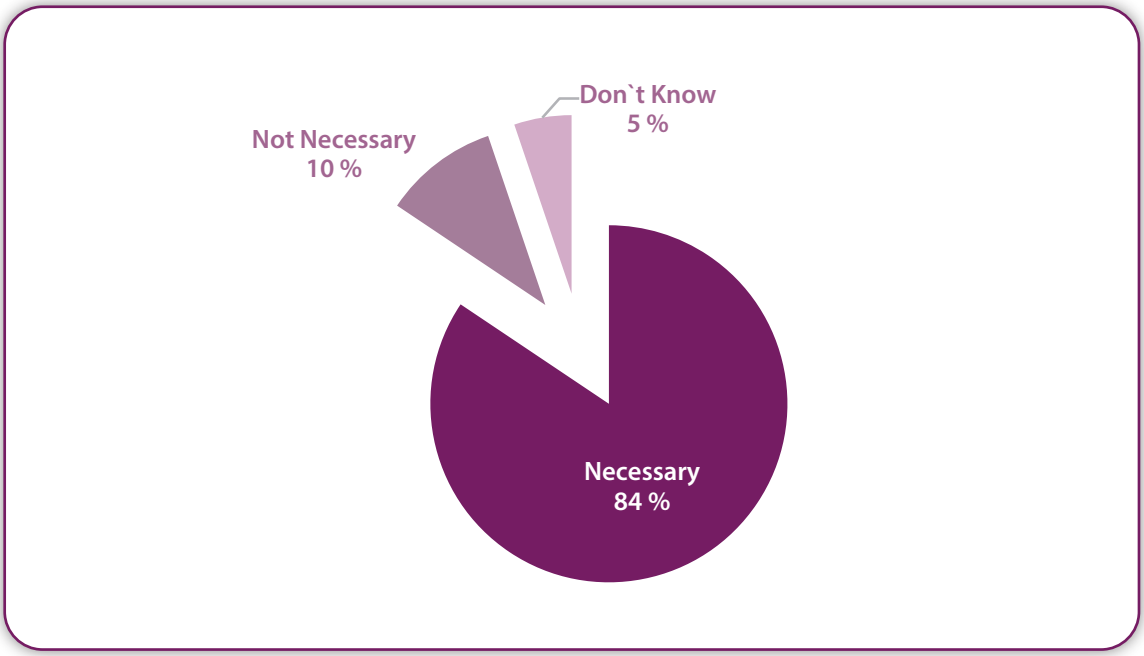
Table 39: Distribution of thawing practices by the employment status of partners

Thawing procedures	Employment status of partner	
	Employed (%)	Unemployed (%)
Put outside the refrigerator	34.1	38.5
Expose to sun or air	9.9	10.8
Put in hot water	12.1	5
Put in the refrigerator	25.3	24
Put in cold water	14.3	14.9
In microwave	0	1.3
Use tap water	0	1.2
Other	4.4	4.3
Total	100	100

As demonstrated in the table above, differences in thawing procedures used by employed and unemployed partners are insignificant.

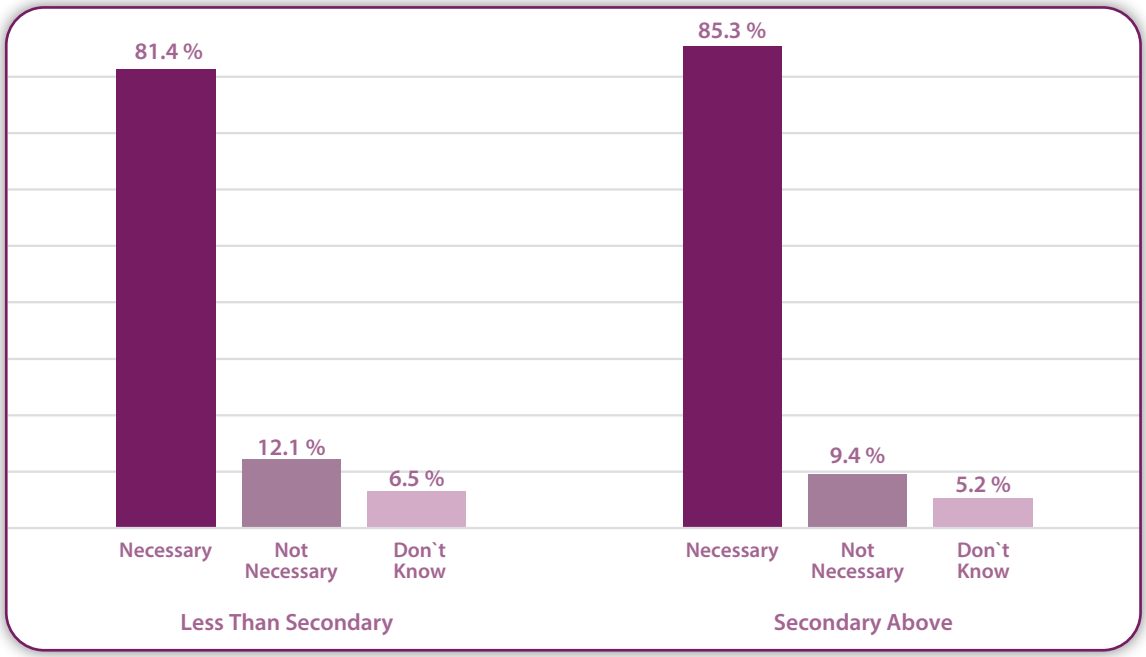
To ascertain respondents' attitudes about following appropriate methods for thawing frozen meat and chicken, respondents were asked whether they felt that it was necessary to adhere to these appropriate methods. The majority of respondents agreed that it was necessary to adhere to such methods.

Figure 8: Respondents holding a positive attitude towards adhering to appropriate thawing methods



Survey findings also show that education level makes little difference in a partner's attitude to adhering to correct thawing procedures.

Figure 9: Partner's attitudes about adhering to correct thawing procedures, by education level



3.2.4 KAP related to using unwashed cutting board and knife

Cross-contamination can happen directly when raw chicken or meat comes into contact with cooked foods, or when using an unwashed cutting board and knife that have been used to carve raw chicken/meat to prepare food that does not need to be cooked. Cross contamination may also happen indirectly if cutting boards and knives are not washed properly. Proper cleaning requires using antibacterial soap and warm-to-hot water. Wooden cutting boards are not recommended as they are harder to clean. Such practices can reintroduce disease-causing organisms – it is always the preferred option to use separate knives and boards.

3.2.4.1 Knowledge and practices related to using and cleaning cutting boards and knives

Respondents were asked (unprompted) how they clean utensils when preparing raw meat, chicken and fish. Survey findings are shown in figures 10 and 11:

Figure 10: Methods for cleaning utensils used in preparing raw meat, chicken and fish

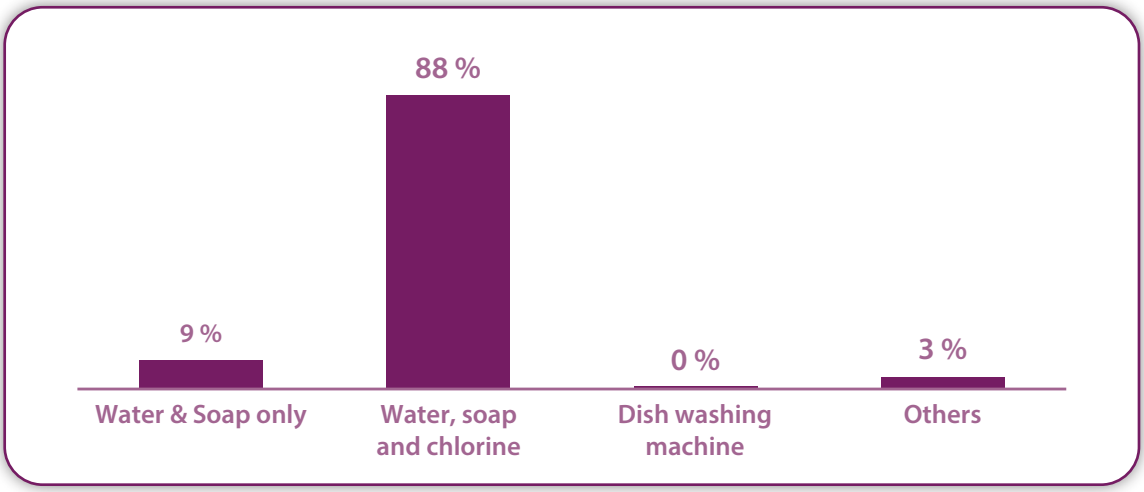
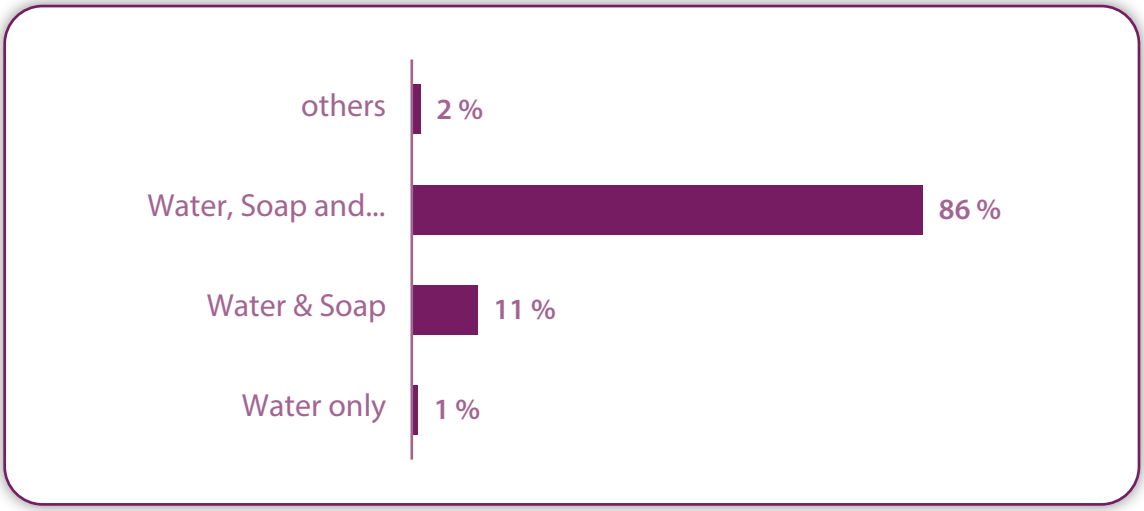


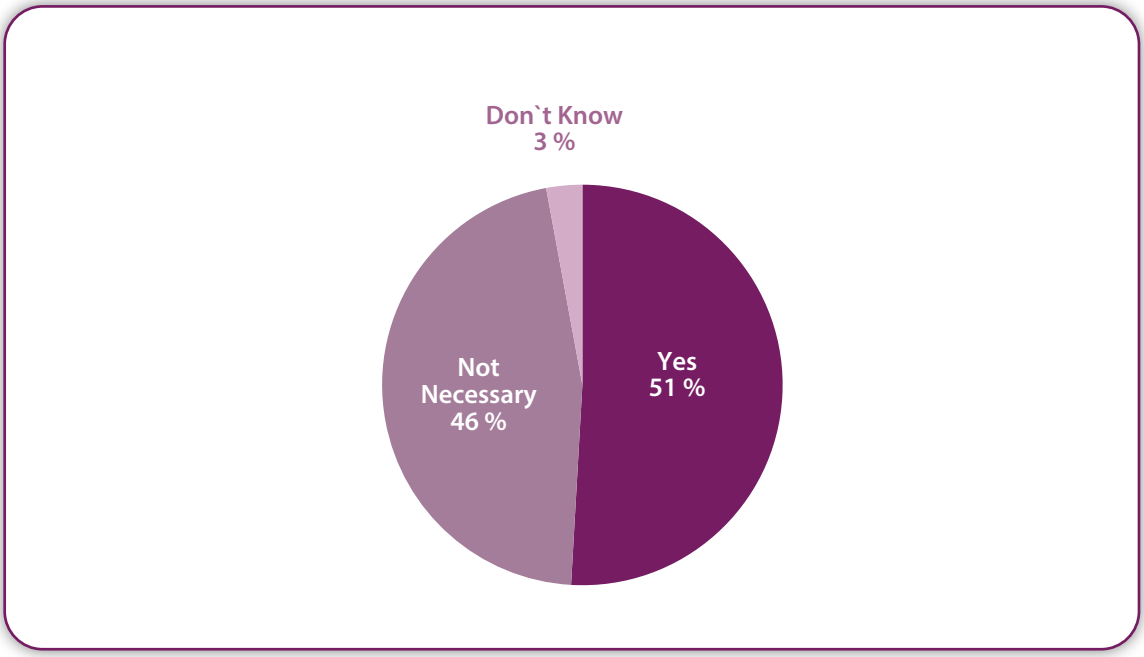
Figure 11: Methods for cleaning cooking surfaces and tools before and after handling raw meat, chicken and fish



3.2.4.2 Practices and attitudes related to using unwashed cutting board and knives

Respondents were asked if they believe that it is necessary to use separate cutting boards, knifes and utensils when preparing raw meat, chicken and fish. Survey findings are shown in the following figure:

Figure 12: Methods for cleaning cooking surfaces before and after handling raw meat, chicken and fish



Respondents were asked about critical safety measures that should be adhered to when preparing food for cooking. Survey findings are presented in the following table.

Table 40: Respondents' attitudes to critical safety measures in food preparation

	Do you adhere to the following steps in food preparation?				Do you think this step is:		
Food preparation steps	Always/ Often (%)	Sometimes (%)	Rarely (%)	No (%)	Necessary (%)	Unnecessary (%)	Don't Know (%)
Use separate equipment/utensils for preparing raw meat, chicken and fish	42.1	7.9	5.9	44.1	58.9	34.6	6.5
If using the same cutting boards for raw meat, fish, chicken and other foods, these boards should be cleaned thoroughly with water, soap and detergent such as chlorine	98.7	0.6	0.6	0	98.8	0.5	0.7
Surfaces should be cleaned and sterilized after preparing raw meat, fish and chicken	99.6	0.4	0.4	0	99	0.5	0.4

Wash hands thoroughly with water and soap when 'shifting' between the preparation of raw meat, fish, chicken and other foods	99.5	0.3	0.1	0	98.8	0.7	0.5
Plates used for raw meat, chicken and fish must not be used to serve other foods until they have been cleaned properly	99.4	0.4	0.1	0.1	99.2	0.2	0.6
Get rid of any bags used for raw meat, chicken and fish and never reuse them	98.7	0.8	0.3	0.2	97.3	1.6	1.1

Moreover, survey findings revealed that partner's level of education bears little influence on the extent to which they adhere to critical safety measures in food preparation.

Table 41: Respondents' attitudes to critical safety measures in food preparation, by partner's education level

Food preparation steps	Partner' level of education	Do you adhere to the following steps in food preparation?				Do you think this step is:		
		Always/ often (%)	Sometimes (%)	Rarely (%)	No (%)	Necessary (%)	Unnecessary (%)	Don't know (%)
Use separate equipment/utensils for preparing raw meat, chicken and fish	Less than secondary	40	6.5	8.3	45.3	58	33.5	8.5
	Secondary and above	48.5	6	6	39.4	64.8	28.4	6.8
Use separate equipment/utensils for preparing raw meats, chicken and fish	Less than secondary	97.6	1.4	0.8	0.2	98.6	1	0.4
	Secondary and above	98.6	1	0.2	0.2	96.6	2	1.4
Surfaces should be cleaned and sterilized after preparing raw meat, fish and chicken	Less than secondary	98.8	1	0.2	0	98	1.8	0.2
	Secondary and above	99.6	0.4	0	0	97.8	1.6	0.6
Wash hands thoroughly with water and soap when 'shifting' between the preparation of raw meat, fish, chicken and other foods	Less than secondary	98.8	0.6	0.6	0	99	0.8	0.2
	Secondary and above	99.6	0.4	0	0	97.8	1.6	0.6

Plates used for raw meat, chicken and fish must not be used to serve other foods until they have been cleaned properly	Less than secondary	99	0.6	0.4	0	98.8	1	0.2
	Secondary and above	99	0.6	0.2	0.2	98	1.2	0.8
Get rid of any bags used for raw meat, chicken and fish and never reuse them	Less than secondary	96.8	2	0.4	0.8	96.8	1.4	1.8
	Secondary and above	97.8	1.2	0.6	0.4	95.4	3.2	1.4

When cooking and food preparation were discussed during focus groups, almost all participants across all focus groups agreed on the need to use different utensils when preparing meat vis-à-vis other foods (especially vegetables), and on the need to marinate meat before cooking it. Some mentioned that they use different utensils when cooking meats and vegetables. However, others use the same utensils, while cleaning them after each usage.

Focus groups in Gaza emphasized the same behaviors. All participants indicated that they use different knives for cutting meat and vegetables for various reasons, such as the need to use a different kind of knife to carve meat as opposed to chopping vegetables. Carving meat requires special, large and sharp knives; while vegetables can be chopped using small, 'normal' knives. Additionally, meat might hold bacteria that could be transferred to vegetables, potentially causing diseases. Some participants added that cutting meat and then vegetables with the same knife will spoil the vegetables (especially their smell). In very rare situations where there is only one knife available, participants indicated that they will start with meat first, since it takes a longer time to prepare. Then, they will wash the knife very carefully before using it to cut vegetables.

3.2.5 KAP related to heating and storing cooked foods

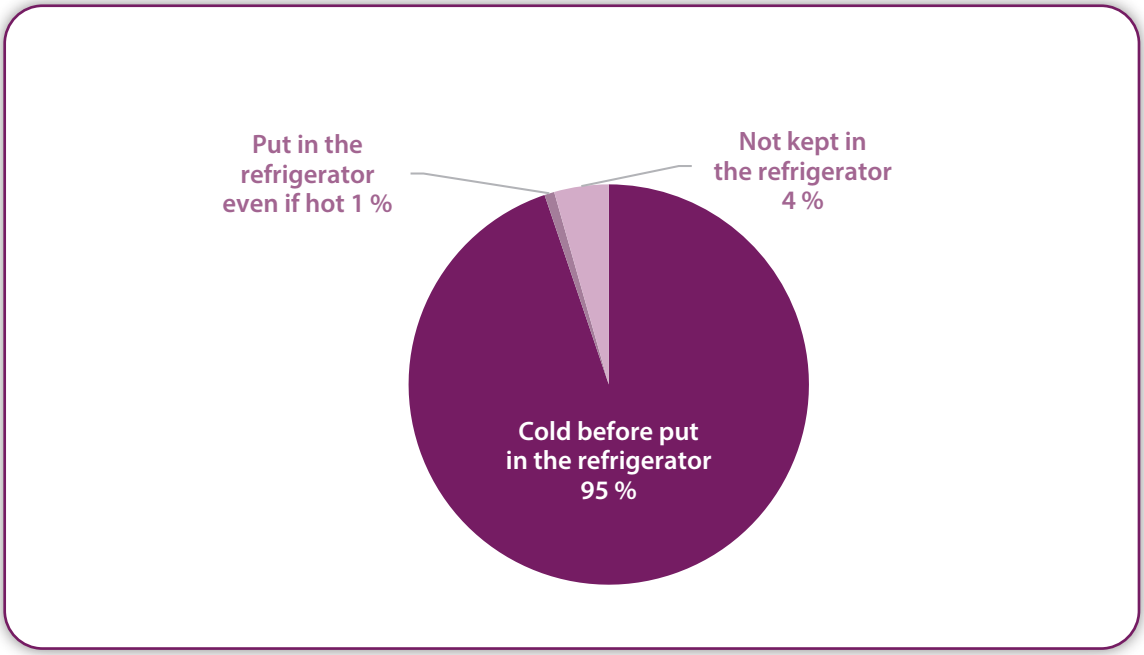
Cooked foods should be eaten immediately after cooking, and leftovers should be stored in a refrigerator directly after the meal. When cooked foods cool to room temperature, microbes begin to proliferate and the longer the wait, the greater the risk (WHO, 2006). Respondents were asked to explain how they store leftover foods. Survey findings are illustrated in the following figure:

Table 42: Respondents' practices in storing cooked food

Where do you store cooked food?	North WB (%)	Central WB (%)	South WB (%)	Gaza (%)	WBGS (%)
In fridge/freezer	99.4	99.7	97.9	91.7	95.2
Outside fridge (uncovered)	0	0	0.2	0.1	0.1
Outside fridge (in closed space)	0.5	0.3	0.1	2.2	1.3
Others	0	0	1.8	6	3.4
Total	100	100	100	100	100

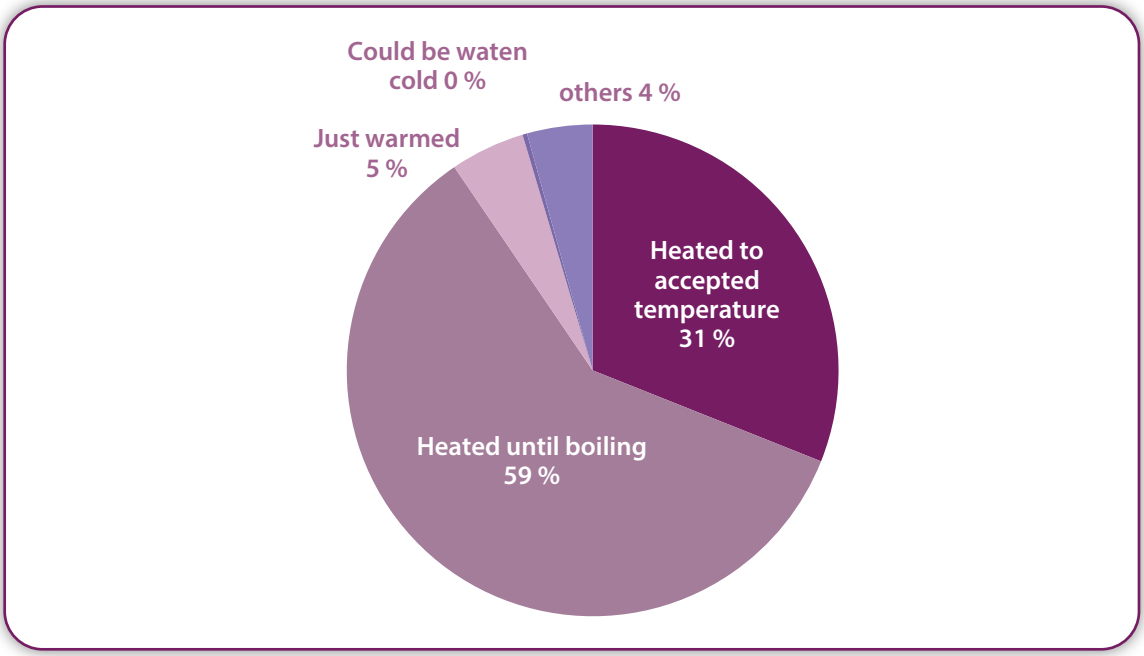
Furthermore, survey findings show that 95 percent of respondents refrigerate cooked food after waiting for it to become cold, while the correct measure is that cooked food should be refrigerated directly. The survey results are shown in Figure 13.

Figure 13: Respondents who refrigerate cooked food after it becomes cold



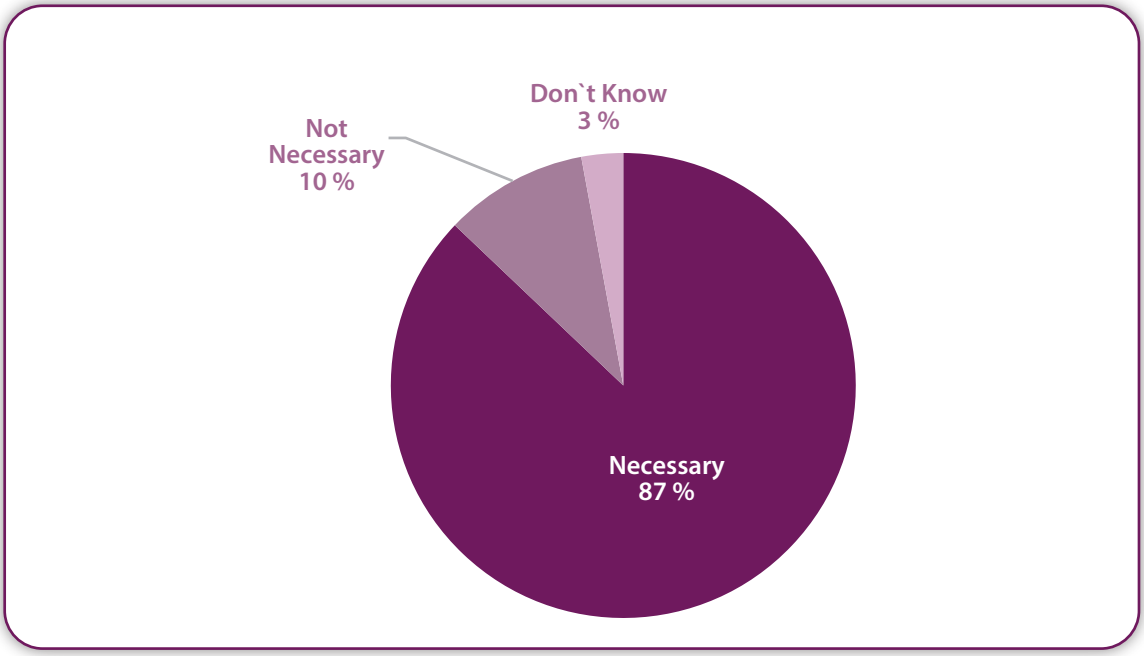
As a rule, cooked foods should be reheated thoroughly. This is an important step in protecting against microbes that may have developed during storage (proper storage slows down microbial growth but does not kill the organisms). Thorough reheating means that all parts of the food must reach at least 70°C (thorough boiling). (WHO, 2006) Respondents were asked to indicate the extent to which they adhere to such measures when reheating cooked food that has been stored. Survey findings are illustrated in the following figure.

Figure 14: Respondents who reheat refrigerated cooked foods



Respondents were asked if they believe that it is necessary to adhere to proper reheating measures. Survey findings are shown in the following figure.

Figure 15: Respondents' attitudes regarding appropriate reheating measures



Almost all focus groups emphasized that the right way to store leftover cooked food is to wait until it becomes cold and put it in a refrigerator. This was mentioned in almost every focus group. A significant number of participants mentioned that they tend to cook the amount of food required to ensure that nothing is leftover.

In Gaza, focus groups participants gave different answers to the issue of storing leftovers. Some mentioned putting food in a refrigerator and not in a freezer, as it will be consumed over the course of the day. Due to electricity cuts, one participant does not put food in a refrigerator or freezer. Another participant said that she feeds leftovers to her chickens; other participants said they do not put leftover food in a freezer as it loses its nutritional value.

Different opinions were raised by participants concerning the issue of reheating refrigerated cooked food. In the Bethlehem focus group, some participants indicated that they only warm leftovers; others make sure that it comes to a boil in order to kill germs. Others, depending on the kind of food, may warm it at different temperatures: e.g. rice would be warmed to a medium temperature. Notably, some participants accumulated beliefs regarding food safety that are not based on scientific evidence but rather on unreliable sources and personal experiences. For example, a participant indicated that she tends not to freeze pastries because of bad health consequences, such as cancer. In Nablus, some participants reheat refrigerated foods at low temperatures, and some foods are not reheated for long periods of time (e.g. spinach). Some women use a microwave. Focus group participants in Haja village explained that they prefer to wait for some time after removing food from a refrigerator, before heating it on a stove. Others do not wait and heat it immediately. The group emphasized, however, that different foods need to be reheated at different temperatures; and sometimes at boiling temperatures. In Beitunia, a participant said she heats food directly after removing it from the fridge, on a high flame for cooked vegetables and a low flame for rice. Another participant indicated that she microwaves rice using a white plate while covering it with another plate. In Gaza, most participants explained that they bring food to a boil in order to ensure its safety.

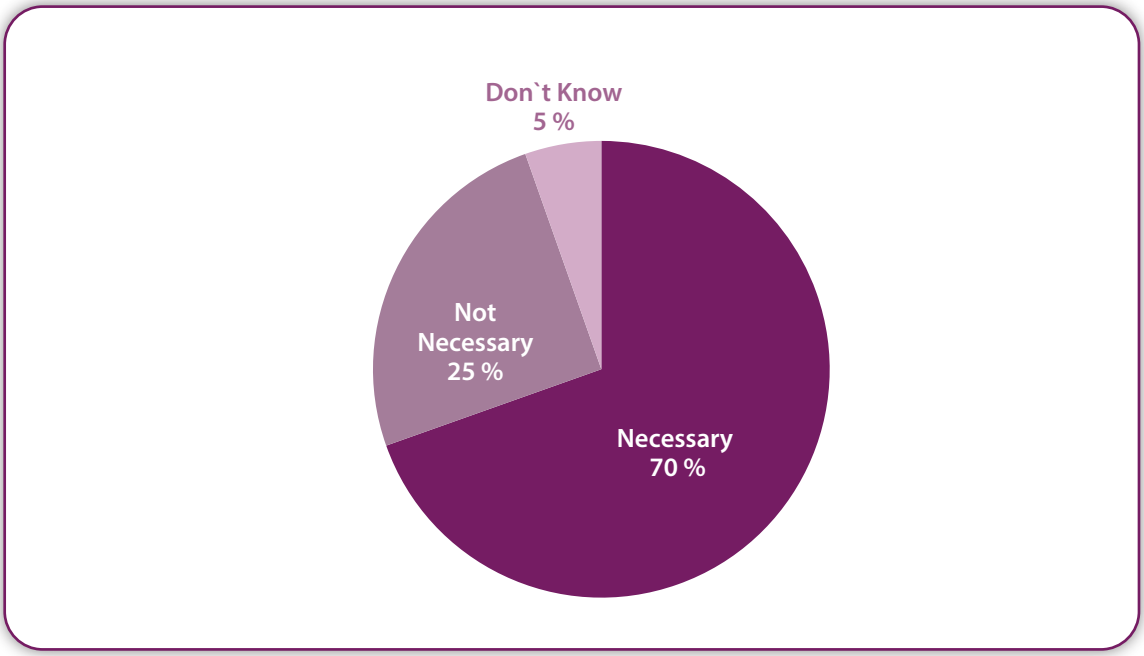
3.2.6 KAP related to cooking eggs

Eggs are considered to be very sensitive to contamination. Although the inside of an egg may appear to be normal, it may contain a germ called *salmonella* that can cause serious illness. Eggs are safe if they are cooked and handled properly. Furthermore, eggs should be washed before their use in cooking, and they should be cooked until both the yolk and the white become firm. Respondents were asked to explain how they cook eggs. Survey findings are presented in the following table:

Table 43: Respondents who wash eggs before cracking eggshells

Do you wash eggs before cracking eggshells?	North WB (%)	Central WB (%)	South WB (%)	Gaza (%)	Country-wide (%)
Yes	37.8	44.5	33.8	57.4	48.4
Sometimes	2.1	0.5	6.8	15	9.3
Rarely	6.5	14.4	8.7	6.3	7.9
No	53.5	40.7	50.7	21.3	34.4
Total	100	100	100	100	100

Figure 16: Respondents' attitudes to washing eggs before cracking eggshells



Survey findings on consumers' practices when cooking eggs show that 76.6 percent of respondents adhere to correct practices - i.e. they cook the egg until the yolk is completely solid. Survey findings also show that with regards to consumers' attitudes, 79.1 percent of respondents are willing to behave properly once they have the correct information.

Table 44: Respondents' attitudes and practices with respect to washing eggs before cracking eggshells, by partner's education level

Do you wash eggs before cracking egg-shells?	Partner's education level		Do you think this step is:	Partner's education level	
	Less than secondary (%)	Secondary and above (%)		Less than secondary (%)	Secondary and above (%)
Yes	41	42.1	Necessary	58.6	63.2
Sometimes	44.2	43.1	Unnecessary	36.2	29.8
Rarely	7.9	8.7	Don't know	5.3	7
No	6.9	6.2	Total	100	100
Total	100	100			

The above table provides additional evidence that food safety practices are correlated to prevailing habits in the family environment and have little correlation to the education level of the female spouse.

3.2.7 KAP related to canned food products

Cans are susceptible to numerous microbes during storage. Therefore, using canned foods without cleaning cans may transfer these contaminants to the contents of cans when they are opened, which can cause poisoning. Survey findings show that 46.6 % of respondents always wash cans before opening them.

Table 45: Respondents who wash cans before opening them

Do you wash cans before opening them?	North WB (%)	Central WB (%)	South WB (%)	Gaza (%)	WBGS (%)
Yes	35	52.2	38.6	51.4	46.6
Sometimes	3.2	0.8	3.6	12	7.5
Rarely	5.8	9.5	10.7	4.1	6.2
No	56	37.5	47.1	32.6	39.7
Total	100	100	100	100	100

While only 47 percent of respondents said they washed cans before opening them, 71 percent of respondents are aware of the need to clean cans before opening them, for the reasons outlined above.

Figure 17: Distribution of respondents' attitudes about washing cans before opening

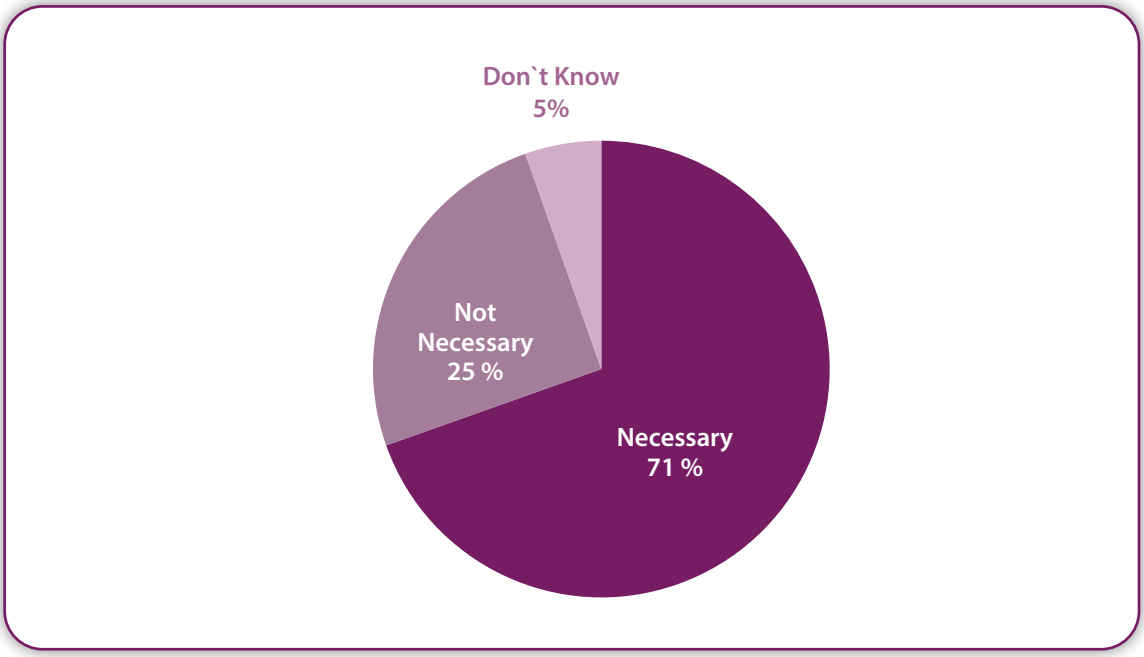


Table 46: Distribution of respondents' attitudes and practices with regards to washing cans before opening them, by partner's levels of education

Do you wash cans before opening them?	Partner's Level of Education		Do you think this step is:	Partner's Level of Education	
	Less than secondary (%)	Secondary and above (%)		Less than secondary (%)	Secondary and above (%)
Yes	38.8	42.1	Necessary	63.4	66
Sometimes	49.7	45.7	Unnecessary	33.1	28
Rarely	6.7	7	Don't know	3.4	6
No	4.8	5.2	Total	100	100
Total	100	100			

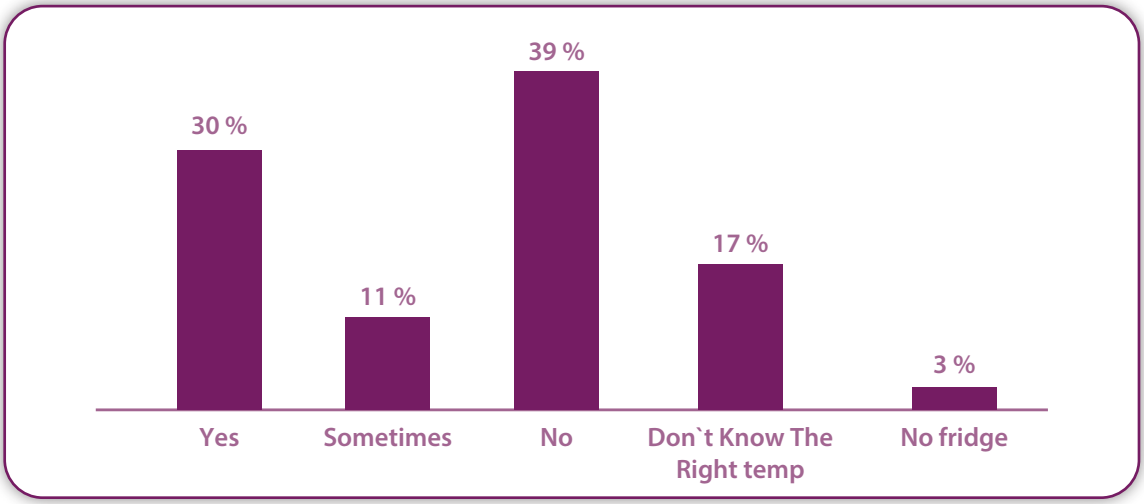
3.3 Storage conditions

Storage conditions are a major health hazard that must be dealt with appropriately to avoid risks to food safety. In order to ascertain the extent to which consumers adhere to appropriate storage practices, respondents were asked to report on how they refrigerate vegetables and meat. Survey findings are presented in the following sub-sections.

3.3.1 KAP in relation to the temperature of refrigerators/ freezers

Respondents were asked whether they check the temperature of their refrigerator. Survey findings show that only 41 percent of surveyed households check the temperature of their refrigerator and freezer on a regular or irregular basis and that 39 percent do not check at all, as shown in the table below.

Figure 18: Distribution of respondents who check fridge/ freezer temperature



Amongst those who check the temperature, only a few are aware of the correct refrigerator and freezer temperatures, as indicated in the below tables.

Table 47: Respondents' knowledge of correct refrigerator temperature

Area	Don't know (%)	Correct response (%)	Wrong response (%)
West Bank	31.9	5.4	62.8
Gaza Strip	71.6	0	28.4

Table 48: Respondents' knowledge of correct freezer temperature

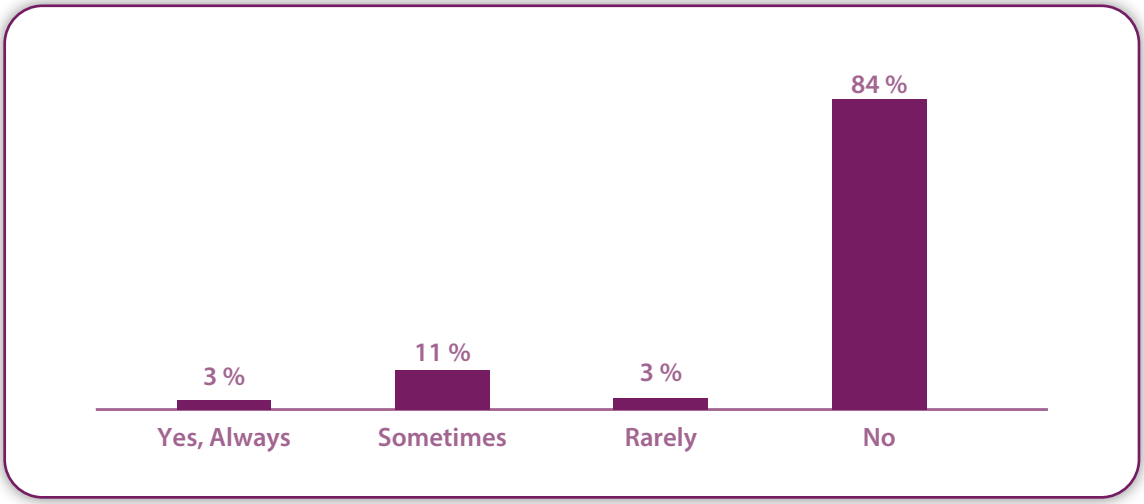
Area	Don't know (%)	Correct response (%)	Wrong response (%)
West Bank	46.3	3.4	50.3
Gaza Strip	72.3	1.4	26.4

3.3.2 KAP of safe-time limits and organization of food in refrigerators

The WHO Manual on Food Safety recommends not to leave perishable foods at room temperature for more than 2 hours. All cooked and perishable foods should be refrigerated promptly, at a temperature below 5°C. However, foods should not be stored for too long even when frozen or refrigerated. Furthermore, cross-contamination during storage is another critical issue when storing foods. It can be prevented through separating raw foods from cooked foods in containers that are safe and prevent leakages; it is important to store meat, sea food, and poultry in the lower shelves to avoid dripping on other foods (WHO, 2006).

With regards to the maximum time allowed for refrigerating food items after their purchase, survey findings show that the majority of interviewed households 93 percent are aware of safe-time limits between food purchase and storage in a refrigerator or freezer. The majority mentioned that food items must be stored no later than two hours after purchase, with little differences across areas and localities. As illustrated in the figure below, 84 percent do not label food products before storing them in the freezer; only 3 percent practice this consistently.

Figure 19: Respondents who label food before storing it in the freezer



Participants in focus groups generally agreed that vegetables and bread should be separated from meat and chicken in fridges. In Gaza, focus group participants explained that storage should follow the following order: bread on the upper shelves, vegetables on the middle shelves, and meat/chicken on the lower shelves. Fish should be stored on the lowest shelf. They further explained that this ensures that juices dripping from meat or chicken will not spoil bread and vegetables. A participant mentioned that she has a special freezer, divided into several sections, in order to preserve different kinds of foods. Another participant uses Styrofoam plates to keep meat and fish in the freezer. A majority of participants in Hebron indicated that they store vegetables on the highest shelves, while others explained that they insert food items in a freezer according to available space, without any considerations for proper organization.

Survey findings show that 43.2 percent of respondents pay no attention to how they organize foods in a refrigerator/freezer, as shown in Figure 20.

Figure 20: Distribution of respondents who follow incorrect refrigeration practices

The lowest rates were in Gaza 37.2 percent, while 65.4 percent in the West Bank mentioned that they organize refrigerator shelves.

The above findings are worrying due to the fact that when raw meats are kept on the top shelves, raw foods on the lower shelves may be contaminated with liquids dripping from the meats, potentially causing serious illness. (WHO, 2006)

With regards to the type of packages used to store food items in refrigerators, respondents were asked (unprompted) what type of packages they use. Survey findings are summarized in the following table:

Table 49: Distribution of households by type of packaging used to store food in refrigerators

What food packages you used for food in refrigerator		Region				Overall (%)
		North WB (%)	Central WB (%)	South WB (%)	Gaza Strip (%)	
Type of package	Any Bags	26	17.2	27.4	52.6	43.2
	Sandwich bags	61.6	55.8	43.5	23.4	45
	Special freezer bags	45.1	50.5	58.3	29.4	43
	Glass containers	12.4	5.2	5.4	2.9	6.8
	Any plastic container	27.5	21.4	59.5	59.7	42.1
	Specialized plastic containers for freezing	10.4	7.8	37.1	31.5	21.2
	Others		1.6	3.6	75	6.5

Finally, respondents were asked about the appropriate length of time for storing food items in a freezer or refrigerator. Survey findings show that almost all households store food within safe time-limits for home refrigeration or freezing. Households usually store food in the freezer for a reasonable period of time, although a significant number of households do not keep meat, chicken and fish in refrigerators.

Focus group participants are not aware of proper procedures for storing or freezing chicken. Regarding the storage of meat, most participants across all focus groups agreed that chicken lasts from one to three weeks in a refrigerator, while meats (especially red meat) usually last longer. In Haja village, some participants believe that vegetables can be stored for long periods of time - up to one year. Meats, on the other hand, can be stored for no longer than one month. Some participants in Askar refugee camp indicated that food should be frozen if it is to be preserved for several months. If the period is only a few days, then vegetables can be put on the top shelves of the refrigerator, while meats should be preserved in the freezer, especially during summer. They stated that meat should not be stored for more than a month. In Betunia and Qalandia, the same opinions were repeated, as well as the belief that seasonal produce (such as peas and vine leaves) can be stored for several months, while meat, on the other hand, can be stored in a freezer for no longer than one month. In the Nablus focus group, participants explained that when they themselves freeze vegetables, they boil them first and add some sugar, then let them cool and cover them afterwards, before finally putting them in the freezer.

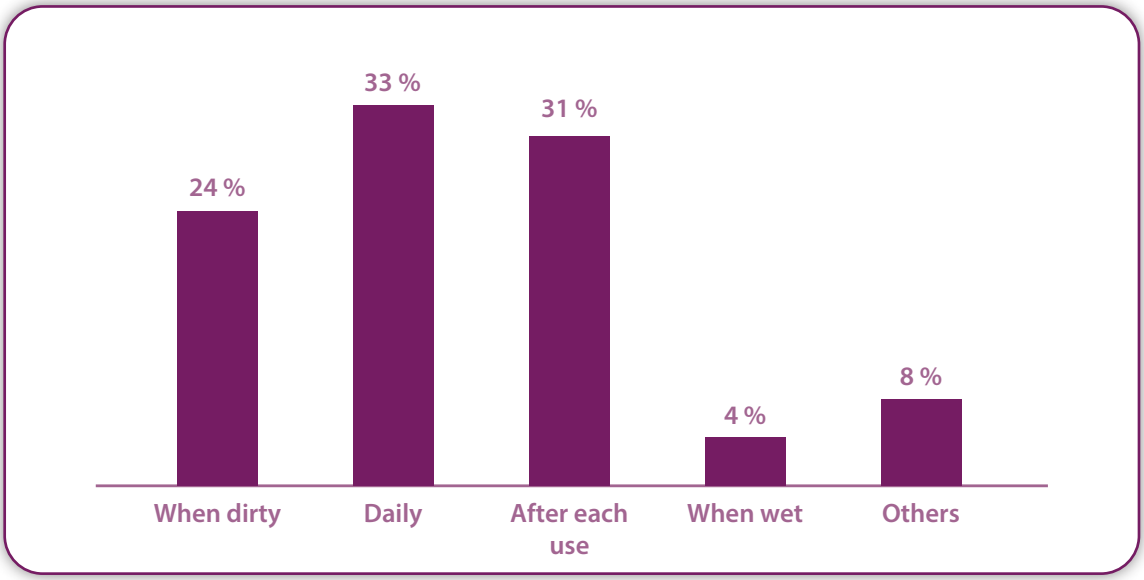
3.4 Hygiene and food poisoning

Since food can be easily contaminated, any surface used for food preparation must be kept absolutely clean. Every scrap of food, crumb or spot can be a potential reservoir of germs. Cloths that come into contact with dishes and utensils should be changed frequently and boiled before re-use. Separate cloths must be used for cleaning floors, and these also require frequent washing. Survey findings with regards to consumers' practices regarding kitchen cloths, sponges and personal hygiene practices are presented in the following sub-sections.

3.4.1.1 Knowledge and practices related to kitchen cloths

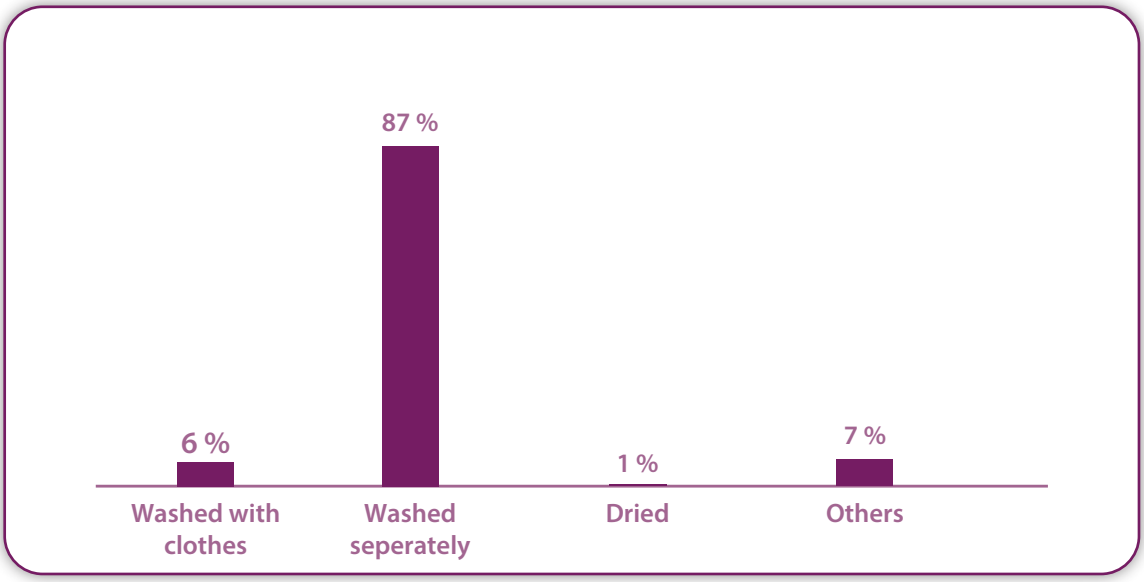
As summarized in Figure 21, respondents were asked (unprompted) when they clean kitchen cloths.

Figure 21: Respondents' practices regarding frequency of cleaning kitchen cloths



With respect to methods for cleaning kitchen cloths, survey findings are shown in the following figure:

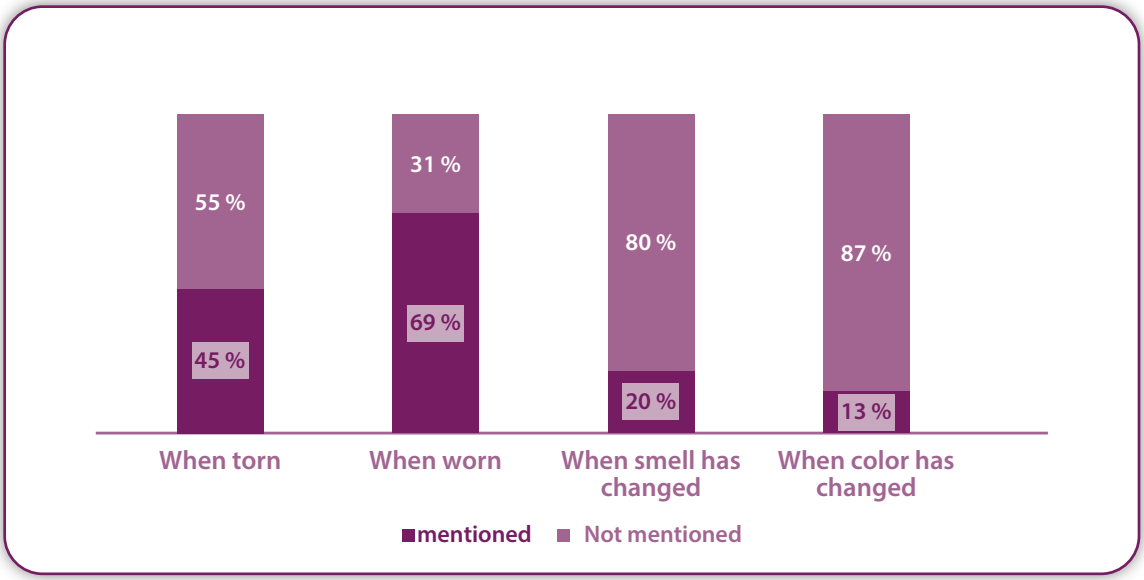
Figure 22: Respondents' practices for cleaning kitchen cloths



3.4.1.2 Knowledge and practices related to kitchen sponges

With regards to washing sponges, survey findings are presented in the figure below:

Figure 23: Respondents' practices regarding replacing kitchen sponges



A high percentage of respondents are not aware of when they should replace sponges, with 22.1 percent mentioning that they replace sponges when they become dirty; 32.6 percent on a daily basis; 36.6 percent after each use; and 3.2 percent when sponges become wet.

Illnesses can be caused by germs on kitchen sponges, as they easily collect bacteria from food items and from dirt when sponges are used to wipe surfaces. Germs can be transported from the sponge to the hands and body. Sponges generally become dirtier the more they are used, especially as they are used to wipe down kitchen counters, chopping boards and sinks, or when they are stored in certain conditions. Smelly sponges, color changes and sponges that tear are all obvious signs of contamination, requiring these sponges to be replaced.

To properly disinfect kitchen sponges, they should be soaked in a mixture of warm water and bleach (¼-½ of a teaspoon of bleach per quart of water, then soaked for a minute or so before wringing and drying). Sponges should not be kept wet: wet sponges on a counter-top allow bacteria to multiply at a much faster rate. In addition to soaking, microwaves and dishwashers can be used to sanitize sponges before use (UDSA, 2007).

3.4.1.3 Attitudes related to personal hygiene

Nearly all interviewed households 99 percent reported positive attitudes with respect to washing their hands at critical times, such as after using the toilet; before preparing food; after touching raw meat, chicken or fish; before and after eating; after getting rid of garbage; and when they are disturbed during cooking (e.g. to answer a phone).

3.4.2 Food poisoning

Only 3.3 percent of interviewed households reported that they suffered food poisoning during the last year. In fact, it is difficult for respondents to identify the symptoms of food poisoning, since these symptoms are similar to other health disorders. The differences in such symptoms cannot be diagnosed without a laboratory test. Resultantly, only acute cases of food poisoning are reported. About 90 percent of reported cases were referred to medical care, where the cause and diagnosis of food poisoning was determined. Out of the 82.4 percent of those who were infected and sought professional care, 89.3 percent of those who sought medical care were diagnosed and the cause of the food poisoning was determined. In contrast, 62.5 percent of those who did not seek medical help used herbal drinks as an alternative; 12.5 percent used home remedies and

25 percent used normal painkillers. Households in general are not aware of all food poisoning symptoms, with only 30 percent of West Bank and 8 percent of Gazan households identifying five or more out of the 12 critical symptoms, as shown in the following table:

Table 50: Respondents' knowledge of food poisoning symptoms

Symptom	Percentage of respondents who mentioned the symptom (%)	Percentage of respondents who did not mention the symptom (%)
Abdominal cramps and pains	73.7	26.3
Nausea and vomiting	82.4	17.6
Migraine/ headache	20.3	79.7
Diarrhea	59.1	40.9
Fever with chills and sweating	32	68
Muscle Pains	5	95
General weakness/ fatigue potentially leading to paralysis	4.5	95.5
Blurred vision	95.3	4.7
Dehydration	5.8	94.2
Continuous vomiting possibly accompanied by blood	17	83
Dizziness	21.7	78.3

3.5 Modes of communication with consumers

Survey findings show that most respondents learn about general health topics from the different sources listed in the table below.

Table 51: Sources of general health information

Information source	Respondents who occasionally obtain information from this source (%)	Respondents who always obtain information from this source (%)
Social media	44	65.7
TV	67.8	54.2
Radio	16.5	49.4
Newspapers	2.3	28
Magazines	3	41.9
Street announcements	4.7	43.1
Internet	43.5	55.1
Family members/ neighbors	44.1	40.3
Institutions	13	23.6
Others	13.4	47.5

As illustrated in the above table, TV is the main source of health information for more than two-thirds of respondents, followed by word of mouth (family/neighbors/relatives) and the internet, including social media. Other sources were mentioned by a minority of respondents.
When respondents were asked about their opinion regarding the availability and accessibility of food safety information, about 38 percent of them mentioned it is sufficiently available, while 37 percent consider it to be somewhat available, albeit insufficiently and 25 percent indicated that this information is unavailable or inaccessible, as outlined in the following table:

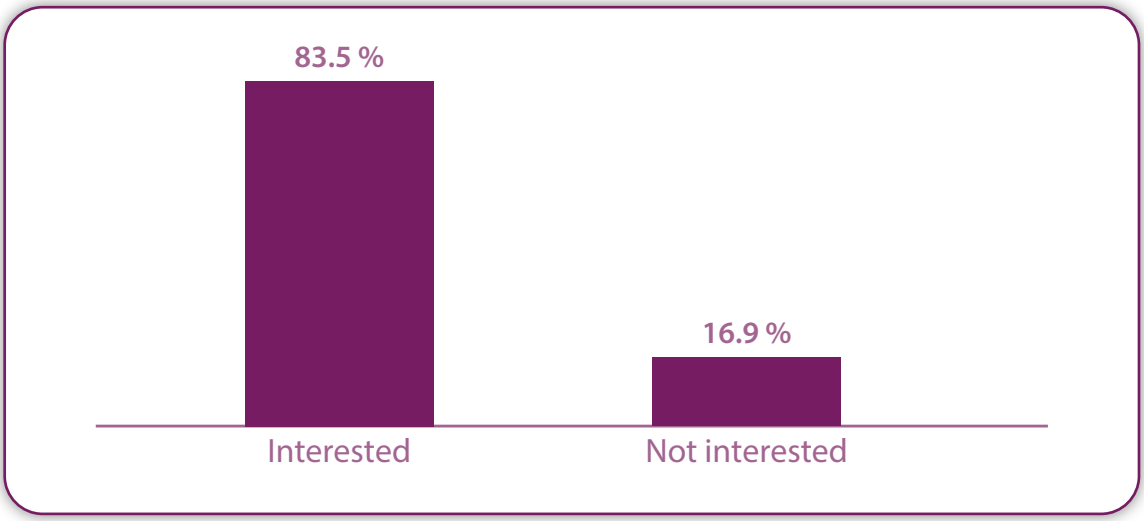
Table 52: Respondents' assessment of the availability and sufficiency of food safety information

Responses	Type of locality			Overall
	Urban (%)	Rural (%)	Camps (%)	
Yes, sufficient	39.9	33.8	40.7	37.9
Yes, but insufficient	39.2	37.8	30.2	37.1
No	17.7	20.7	24.1	19.9
Don't know	3.2	7.7	5	5.1
Total	100	100	100	100

As can be observed from the above table, a slightly higher percentage of respondents in urban areas are of the opinion that food safety information is fully or partly available.

Around 56 percent of respondents indicated that the food safety information that they receive is either non-existent (not available) or insufficient. Promisingly, 83.5 percent of respondents indicated that they would like to learn more about food safety, indicating that food handlers at households are interested in receiving such information, as outlined in the following figure:

Figure 24: Respondents interested in receiving further information on food safety



Household members suggested several sources that they believe can help in this area, including awareness-raising sessions, educational materials and traditional/social media.

Focus group participants, particularly those in Bethlehem, emphasized that the most effective means for raising food-safety awareness was through a central role for relevant public institutions in promoting and enforcing food safety; as a complementary action to spreading public knowledge about this issue through different media outlets (online or offline). Focus group participants in Bethlehem mentioned holding workshops and awareness campaigns on television and social media, especially with respect to school students. Focus group participants in Nablus mentioned awareness campaigns through radio and television broadcasting, social media and leaflets, as well as targeted workshops, sharing personal experiences and the knowledge of dietitians. Social media was mentioned by several focus groups in the WBGS. While participants in Qalandia suggested field visits to retail outlets and households; those in Haja suggested media campaigns.

SECTION 4

CONCLUSIONS AND RECOMMENDED INTERVENTIONS

4.1 Results synopsis

4.1.1 Purchasing phase

- Despite the fact that the majority of households have proper knowledge of how meat, chicken, fish and frozen foods should be stored; almost half of them still follow inappropriate practices as they may buy these food items from stores that are not storing them appropriately. Furthermore, the majority lack proper knowledge of the purpose of meat stamps.
- Most consumers buy factory-made dairy products (pasteurized), which indicates good practice since these products are heat-treated to kill harmful bacteria and prevent bacteria-induced diseases. Survey findings show that households (especially in rural areas) who buy fresh milk and milk products from farmers are not aware of safety standards and depend on their experiences with the supplier.
- Most households believe that checking the expiry date for dry foods is not necessary, and less than half do so.
- With respect to the time elapsed between purchasing food stuffs, particularly meat and fish, the majority of consumers reach home within an acceptable time-limit after purchasing these products.
- Around less than half of interviewed households adhere to correct practices when purchasing meat, chicken, fish and frozen foods.

4.1.2 Cooking and preparation

Although some consumers do not follow safe procedures while food preparation and cooking procedures, they do hold a positive attitude towards changing their practices. Some consumers lack the proper knowledge to do so, and their current practices are based on what they learned from their families. Providing proper learning opportunities is expected to make considerable positive change to their practices.

- Appropriate (safe) thawing procedures are practiced by only 39 percent of households. The remainder mentioned using unsafe methods; however, 83.8 percent have positive attitudes towards following safe thawing procedures.
- 41 percent of interviewed households in the West Bank and 21.8 percent in the Gaza Strip mentioned critical steps on how to properly clean green, leafy vegetables. 69.5 percent of households in the West Bank and 59.8 percent in the Gaza Strip have positive attitudes towards following critical steps for the proper cleaning of leafy, green vegetables.

4.1.3 Food storage and hygiene practices

Food storage was identified as a critical issue that needs further attention. In spite of the fact that consumers have the right knowledge on required food storage conditions in retail stores, some of them buy foods from stores that do not adhere to appropriate food storage methods. Findings suggest that 47.7 percent of consumers buy meat that is hanging outside of the refrigerator (inside or outside the shop), while 8.5 percent of consumers buy fish that is stored outside a refrigerator or freezer. For chicken and frozen foods, the situation is less risky. Furthermore, about one third of the consumers are willing to buy fresh meat that is not stored appropriately, with a majority in Gaza. Only a small percentage of consumers are willing to purchase inappropriately (outside the freezer or without ice) stored frozen-fish. The findings show that there are no significant differences with respect to the level of education of the head of household or partner when it comes to these practices.

- Critical issues related to storage at home are: correct freezer/refrigerator temperatures; the use of inappropriate packages for storage; and inappropriate ordering (organizing) of food stuffs on freezer/refrigerator shelves.
- Households have a positive attitude towards issues related to hygiene, but since they lack

the proper knowledge, they do not always follow the right practices. Unsafe practices were identified mainly in relation to the usage of kitchen towels and sponges.

4.1.4 Survey findings with respect to the socio-economic profile of households

- The results show that household heads and, if applicable, their partnerpartners are primarily responsible for purchasing chilled/refrigerated food items and canned/dried food products, while partner are primarily responsible for purchasing fresh dairy products. Should other family members buy food items, they are expected to obtain the advice and approval of their parents regarding what quantity to buy, and from which store/outlet.
- Survey results show that partnerpartners tend to buy from a fixed source. When purchasing meat products, there is little difference in the purchasing habits of decision-makers: the majority tends to buy these food items at the end of their shopping trip, with a higher percentage in the case of household heads.
- Consumers in Gaza are more concerned with hygiene practices when buying fish compared to fresh meat. In the West Bank, findings show that consumers are equally concerned with hygiene practices when buying fish or fresh meat.
- The education level of female partner bears little impact on food safety attitudes and practices, which tend to be uniform irrespective of education level. Food preparation and cooking is based on accumulated knowledge in the family, without correlation to female partner' levels of education. Furthermore, there is little difference in adhering to correct thawing practices between employed and unemployed partner. With respect to cleaning methods for non-leafy and leafy fruits and vegetables, levels of education reveal slight differences in KAPs.

4.1.5 Survey findings with respect to geographical location (West Bank or Gaza Strip)

Consumers in Gaza reported better habits in some food safety practices, while in other areas West Bank respondents returned more positive results. For example, survey findings show that the majority of consumers purchase chilled food items from a fixed source, while in Gaza a slightly higher proportion buy meat from a fixed source, while a smaller percentage buy fish from a fixed source. When respondents were asked whether they check the stamp on fresh meat, 30 percent in Gaza reported that they do check the stamp while about 50 percent do not; however, about 52 percent of households in Gaza do not purchase fresh meat. Consumers in Gaza tend to be more concerned with hygiene practices when buying fish compared to fresh meat. In the West Bank, findings show that consumers are equally concerned with hygiene practices when buying fish or fresh meat. The vast majority of consumers in Gaza about 77 percent - compared to 21percent of consumers in the West Bank - are willing to purchase inappropriately-stored fresh meat. Almost all consumers in the West Bank and Gaza are not willing to purchase inappropriately stored frozen fish. In terms of purchasing fresh fish, those in Gaza are more willing to buy it even if it is not stored in a refrigerators, as recently caught fish can be bought in Gaza without being cooled first.

- About half of households 48.6 percent do not purchase fresh dairy products; about (68 percent) of households in the northern West Bank purchase fresh dairy products; less than one-third of households in Gaza purchase these products.
- Almost all respondents reported that they tend to store cooked food in a refrigerator, while many households in Gaza indicated that they rarely have leftover food for storage.
- With respect to knowledge and practices related to the consumption of eggs, more than half of the consumers in Gaza reported washing eggs before cracking the shells, compared to one-third in the West Bank. The same trend applies to canned products, where a higher percentage of consumers in Gaza reported washing cans before opening them, relative to respondents in the West Bank.
- With regards to the type of packages used to store food items in refrigerators, a higher

percentage of consumers in the West Bank use appropriate types of packaging to store food items. In Gaza, the majority use any available type of packaging.

- Finally, despite some differences in food safety KAPs, it would be plausible to communicate key food safety messages in the West Bank and Gaza in the same manner and frequency.

4.1.6 Availability of information on food safety

It is clear that the availability of information on food safety is lacking and insufficient: households do not have appropriate, reliable sources of food safety information.

4.2 Main conclusions and messaging

More than 56 percent of respondents mentioned that the information they receive on food safety is either non-existent (not available) or insufficient. The vast majority 83.5 percent of respondents indicated that they are interested in learning more about food safety. This suggests that household level food handlers are interested in receiving food safety information. Drawing on the main conclusions of this KAP study, the main messages for future awareness campaigns are as follows:

Purchasing phase:

The results of the purchasing phase clearly indicate that a significant portion of consumers buy meat, chicken, fish and frozen foods from any supplier, while others buy from stores without proper storage conditions (inappropriate temperature). In addition, a majority of consumers buy fresh milk and milk products from any supplier, without checking the safety of the product and the containers that are used to store it. Accordingly, there is a need to emphasize the following messages in awareness-raising campaigns:

- Meat, chicken, fish and frozen foods should be purchased from licensed stores.
- Check for the presence of a health stamp (slaughter house stamp) on fresh meat
- Meat, chicken, fish and frozen foods should be purchased from stores that store these items at an appropriate temperature. The temperature of refrigerators should be set at 4°C or below. The temperature of freezers should be set at -18°C or below.
- The time that elapses between purchasing these food items and returning home should not exceed two hours in the winter and one hour in the summer. Foods should be placed in the fridge or freezer immediately upon arriving home.
- Fresh milk and milk products should only be purchased from licensed suppliers who use clean and appropriate containers for storing these products.

Cooking and preparation phase:

the results show that a significant percentage of consumers use the same cutting board for meat, chicken and other raw foods. They eat soft or runny eggs (not cooked to complete solidity) and leftovers that are not properly heated (either cold or inadequately reheated). They thaw meat and chicken by placing these outside a fridge, subjecting them to sunlight or soaking them in hot water. They let food cool before storing it in the fridge. Green, leafy vegetables are cleaned using water only. Canned foods are opened without cleaning; while eggs are cracked open without first cleaning the egg-shells. Accordingly, the following messages should be emphasized in awareness-raising campaigns:

- If wooden or plastic cutting boards are used, it is imperative to have separate boards for meat/chicken; and other raw foods.
- All cutting boards should be cleaned thoroughly with hot water, detergent and appropriate disinfectants (such as chlorine).
- Eggs should be eaten only when both the yolk and the white are completely solid.

- Leftovers should be reheated by bringing them to a rolling boil.
- Meat and chicken should be thawed by moving these items from the freezer to the refrigerator; or by soaking them in very cold water that is changed frequently.
- Foods should be stored in a fridge directly after eating, even if they are still hot.
- Green leafy vegetables should be cleaned as follows: (1) separate the leaves to allow for better cleaning; (2) soak the leaves in water; (3) wash the leaves in clean water; (4) leave them to dry by placing them in a kitchen drainer basket.
- Cans must be cleaned with water and soap before they are opened.
- Egg-shells should be cleaned with water and soap before cracking them open to cook eggs.

Food Storage:
The results show that some consumers do not store food items properly, organize freezer shelves correctly or separate food items by type. Some consumers will use any random, unlabeled bag to store foods in a refrigerator/freezer, and pay little attention to fluctuating freezer/ fridge temperatures. Accordingly, the following messages should be emphasized in awareness campaigns:

- Freezer shelves should be organized such that the same food-groups are placed in separate shelves. The upper shelves should be used for vegetables and bread; the lower shelves for meat and chicken.
- Containers or bags should be appropriately labeled when storing food in refrigerator/ freezer.
- Refrigerator and freezer temperatures should be monitored and set at (or below) 4°C for fridges and -18°C for freezers.

Hygiene Practices:
With respect to hygiene, many consumers use kitchen cloths multiple times before washing them, or use unclean, smelly and torn washing sponges. Others do not clean kitchen sponges after each use, leave wet sponges on countertops or follow inappropriate hand washing practices.

4.3 Recommendations

The findings of this study identified major gaps in food safety KAPs. Survey findings and conclusions serve as a useful starting point in defining strategies for the development of a comprehensive and effective awareness campaign to promote food-safety best practices across the entire food-handling life cycle. Assessing the impact of these campaigns in the future can be conducted by measuring changes in KAP indicators relative to KAP measurements in this survey.

Based on survey results, discussions with FAO experts, in the workshop with related ministries (MoA, MoH, MoNE, PSI) and other stakeholders, the following subsections present a set of recommendations for the development of an awareness campaign, as well as a set of activities to address important food safety issues. It must be noted that there are numerous stakeholder groups that need to be engaged in addressing food safety KAPs.

4.3.1 General Recommendations

It is recommended to use public awareness campaigns to positively influence consumers' attitudes and practices, encouraging them to exercise caution when buying, storing, handling and preparing food. This should cover chilled food, dairy products, dried foods and canned food products. Moreover, special emphasis should be given to households that purchase fresh dairy products from farmers or middlemen.

In addition to awareness raising campaigns, the findings indicate that there is a need for public health enforcement authorities to monitor the adherence of food stores to the required safety standards, as consumers can only judge the quality and safety of various food products based on their limited knowledge: they are not always capable of judging the potential risk of microbial contamination.

Moreover, the current enforcement of regulations is not always effective. For example, some butchers in the Hebron area indicated that more than (80 percent) of livestock slaughtering happens outside the formal slaughterhouse facility (i.e. with no veterinary oversight). Raising consumers' awareness of food safety issues should be integrated with enforced public control mechanisms. These mechanisms should monitor and regulate the food safety measures practiced by retail outlets across the supply chain in the sale of raw and cooked foods to Palestinian consumers. For example, survey findings show that only (20.5 percent) of consumers always check the Health Certification stamp on fresh meat that they have purchased. Amongst those who do check the stamp, only a few understand the meaning of different types of stamps on fresh meat. Despite the importance of food safety regulations, they are not being communicated effectively.

Furthermore, public awareness campaigns should encompass the training of food handlers on food safety and hygiene practices and procedures in order to reduce the risk of possible contamination; identify the most effective approaches for the awareness campaigns to target the different socioeconomic groups in the Palestinian context; engage relevant stakeholders in the development of awareness campaigns and related activities; support grassroots organizations in their efforts to educate the public on food safety best practices; and establish media platforms and channels through which targeted audiences can be reached directly.

It is extremely important to develop and implement an effective capacity building component for the employees who work in consumer protection and food safety awareness and others to upgrade their skills and capacities in the fields of public health, communication and awareness campaigns.

4.3.2 Main Messages

Several international and regional parties can be engaged in the process of developing key messages on food safety. Recommendations on the most important messages, based on survey findings, are outlined below. These can complement other messages recommended by other stakeholders.

It is recommended that messages be tailored to encompass the required content and the appropriate means of communication for reaching targeted audiences. Messages should be comprehensive and detailed. Although there are noticeable differences in KAP amongst different groups, depending on region and type of locality, there are some widespread and critically unsafe practices.

The table below summarizes the content for proposed messages

Table 53: Food-borne Illnesses – awareness raising topics

Risky behaviors that lead to food-borne illnesses/ food poisoning	Promotional Messages
Purchasing and Transportation Phase	
Buying meat, chicken, fish and frozen foods from any supplier.	Meat, chicken, fish and frozen foods should be purchased from licensed stores.
Buying meat, chicken, fish and frozen foods from stores/ suppliers that store these items at an inappropriate temperature.	Meat, chicken, fish and frozen foods should be purchased from stores that store these items at an appropriate temperature. The temperature of refrigerators should be set at 4°C or below. The temperature of freezers should be set at -18°C or below.
Purchasing meat, chicken, fish and frozen foods without consideration of the time required to transport these items back home.	The time that elapses between purchasing these food items and returning home should not exceed two hours in winter and one hour in summer. Foods should be placed in a fridge or freezer immediately upon arriving home.
Buying fresh milk and milk products from any supplier, without checking the safety of the product and the containers that are used to store it.	Fresh milk and milk products should only be purchased from licensed suppliers who use clean and appropriate containers for storage.
Buying fresh meat without checking the health and quality stamp	All fresh meat should be slaughtered at a slaughter house and stamped with a health and quality stamp
Cooking and Preparation Phase	
Using the same cutting board for meat, chicken and other raw foods.	If wooden and plastic cutting boards are used, it is imperative to have separate boards for meat, chicken and other raw foods. If glass cutting boards are used, then these should be cleaned thoroughly with hot water, detergent and appropriate disinfectants (such as chlorine).

Eating soft or runny eggs (not cooked to completely solid).	Eggs should be eaten only when both the yolk and the white are completely solid.
Eating leftovers that are not properly heated (either eaten cold or with insufficient reheating).	Leftovers should be reheated by bringing them to a rolling boil.
Thawing meat and chicken by placing these outside a fridge, subjecting them to sunlight, or soaking them in hot water.	Thawing meat and chicken should be done either by moving these items from the freezer to the refrigerator; or by soaking them in very cold water that is changed frequently.
Letting food cool before storing it in the fridge.	Foods should be stored in a fridge directly after eating, even if they are still hot.
Green, leafy vegetables are cleaned using water only.	Green leafy vegetables should be cleaned as follows: (1) separate the leaves to allow for better cleaning; (2) soak the leaves in water; (3) wash the leaves in clean water; (4) leave them to dry by placing them in a kitchen drainer basket.
Opening canned foods without cleaning the cans.	Cans must be cleaned with water and soap before they are opened.
Eggs are prepared without cleaning egg-shells before cracking them open.	Egg-shells should be cleaned with water and soap before cracking them open to cook eggs.
Food Storage	
Freezer shelves are not organized correctly, and food items are not separated by type.	Freezer shelves should be organized such that the same food-groups are placed in separate shelves. The upper shelves should be used for vegetables and bread; the lower shelves for meat and chicken.
Using any random, unlabeled bag to store foods in a refrigerator/ freezer.	Containers or bags should be appropriately labeled when storing food in refrigerator/ freezer.
Fluctuating freezer/ fridge temperatures.	Fridge and freezer temperatures should be monitored and set at - or below 4°C for fridges and -18°C for freezers.
Hygiene Practices	
Using a kitchen cloth multiple times before washing it.	Kitchen cloths must be replaced after each use, and should be washed separately.
Using unclean, smelly and torn washing sponges.	Smelly and torn food sponges with food residues should be replaced.

Not cleaning kitchen sponges after each use, or keeping wet sponges on countertops.	Kitchen sponges should be cleaned appropriately after each use. To properly disinfect kitchen sponges, they should be soaked for at least one minute in a mixture of warm water and bleach (¼-½ of a teaspoon of bleach per quart of water), and then wrung dry).
Inappropriate hand washing practices.	Hands should be washed thoroughly with water and soap at the following critical times: after using the toilet; before preparing food; after touching raw meat, chicken or fish; before and after eating; after getting rid of garbage; when cooking is resumed after interruption (e.g. to answer the phone).

4.3.3 Target groups

Despite the fact that a significant proportion of respondents indicated that male heads of household usually purchase chilled food items, the storage of these items at home and their preparation is usually managed by partnertheir partner. This implies that messages related to food purchasing should be directed at household heads and their partnerspartner. Messages related to food preparation should be directed predominantly to their partnerspartner.

The following sub-groups need to be targeted in food-safety awareness campaigns:

Female heads of households and partners:

Women are the most likely to be engaged in food preparation and storage at home; and, where relevant, they bear influence on male heads of household regarding purchasing needs and locations. Slightly more than one-quarter of the partnerpartners that participated in this survey have post-secondary education, while about half of them failed to complete secondary education and 7.7 percent are illiterate. Furthermore, about 15 percent are part of the labor force.

As such, it is important to focus on communication channels that can reach directly into homes and that include audiovisuals tools with a minimal amount of text, in order to facilitate the delivery of messages to women with low educational attainment levels. Local radio and TV stations can also be used. Messages should include information related to the entire food handling chain.

Heads of household:

Survey findings show that about 90 percent of household heads are men aged 21 years or more. More than half of them have not completed secondary education, while 77.2 percent are part of the labor force. Aside from partnertheir partners, men are the other primary decision-makers in selecting retail outlets and assessing their hygiene conditions. For this group, messaging should focus on the purchasing phase of the food handling chain.

Students/ youth:

Some participants in focus groups indicated that they still recall the information that they gained during their school days when they were exposed to food safety issues in a class called "Health and Environment." Youth do bear some influence on their families.

Interventions in this regard should be coordinated with the Ministry of Education (MoE), as it has a specialized school health unit, which focuses on developing and improving students' mental, physical, psychological and social well-being. Typically, the Ministry implements such activities with the cooperation of partners: NGOs and international aid agencies. Partnering with the MoE should aim to educate students (and hence their families) on basic food safety practices and the adoption of healthy lifestyles. However, there is a need for awareness-raising and capacity-building programs for school staff, so that they can positively influence their students' attitudes and behaviors on food safety.

Health/ social workers and teachers:
Awareness campaigns should include public and primary health workers who can serve as agents of change, through their daily interaction with households at social service centers and clinics.

4.3.4 Communication channels

A wide range of communication channels should be utilized to effectively disseminate information on best practices in food safety. In the field of public health, there is significant potential in building a network of stakeholders to drive awareness campaigns, as collaboration with the partners indicated above is a core factor in achieving envisaged outcomes.

Communication strategies are more effective when they utilize multifaceted communication methods, adapted to each target group to stimulate their interest and obtain their feedback. The survey results show that consumers rely on various modes of communication that serve as sources for food safety information. Two-thirds of respondents pointed to TV as their main source of health information, followed by word of mouth (family/neighbors/relatives) and the internet, including social media. Other sources were mentioned by a minority of respondents.

When respondents were asked to identify TV stations they watch for health programs, most of them mentioned regional (international) channels such as MBC and other stations in Egypt and the Gulf. Others mentioned local stations such as Ma'an TV, Palestine TV, Wattan TV and Al Fajer TV among others. Apart from TV, respondents mentioned radio stations as an important source of health information, identifying local stations such as Ajyal, Amwaj, Voice of Palestine, Aqsa Radio and other local radio stations.

Participants in focus group discussions emphasized that public institutions have an important role to play in promoting and enforcing food safety standards. They emphasized that public institutions should be fully involved in awareness-raising campaigns, as implementing these campaigns with their coordination and participation will make them more trustworthy to citizens.

Such campaigns could include extensive coverage and media attention on food-borne illnesses such as diarrheal disease agents, salmonella and invasive diseases. This could be a very powerful means of enhancing people's readiness and willingness to receive information on food-safety best practices.

The involvement of governmental institutions in such campaigns can help to stimulate public opinion and increase interest in food-safety information relayed by campaigns. Furthermore, public institutions (such as the Ministry of Health and Palestine Standards Institution) have enforcement power over retail outlets. Awareness-raising activities can be implemented directly at these stores, for example, by placing posters on correct storage conditions for chilled food

items, in addition to providing advice on safe food handling and preparation practices at home. Such initiatives should be integrated with messaging through different media outlets (TV and social media) and the establishment of platforms for sharing personal experiences and knowledge.

Participants in the focus group also emphasized the importance of community-based campaigns and events in specific localities across Gaza and the West Bank. This could be facilitated through community-based organizations such as women's centers/societies or local committees. Finally, some participants in focus group discussions indicated that their food safety behaviors are largely influenced by their exposure to food safety issues during their school days.

Survey findings confirm the need to diversify the communication tools used to reach different target audiences. Messages must be formulated to suit specific target audiences and utilize appropriate communication channels. These messages need to be revised regularly, and communication techniques should complement one another. It is essential to use a combination of communication channels. For some groups, the most effective way to approach them is through interactive communications, while for others one-way communications from reliable sources could be more effective.

4.3.4.1 Media communications

Various forms of media need to be used (internet, radio, advertising, TV, local press) depending on the type of information that needs to be disseminated and the primary target groups to be reached. TV is the most popular form of communication identified by respondents. Although a majority of respondents watch regional TV stations, utilizing these channels for campaigns is very expensive. It would be more suitable to use local TV stations, especially Ma'an TV, Palestine TV and Wattan TV.

The survey also shows that there are various sub-groups of target audiences (partnerpartners vs. heads of household; illiterate or basic education vs. post-secondary education). TV and radio are highly effective in reaching inside the home. Messages must include audiovisuals tools with a minimal amount of text, in order to ensure that messages are also accessible to women with low educational attainment levels.

Overall, it is recommended that TV and radio are used to target the general public, but in particular illiterate people or those who are not familiar with digital communications. There are many, diverse forms of media, but local TV and radio stations present the best options. A specialized advertising agency could be contracted to design and implement the campaign through these media channels.

In addition to the above, it is crucially important to involve frontline health practitioners in educating the general public and in communicating messages through face to face meetings with their patients.

4.3.4.2 Digital communications

Survey findings show that 44 percent of respondents obtain some health information through social media, including Facebook and Twitter. Social media is effective since it can reach large audiences. Concise messages can include links to more detailed explanations. Social media is interactive with spontaneous feedback, and content can be shared between users. However, the survey shows that a significant portion of the target group (28.2 percent and 22.5 percent of the

heads of household and partnerpartners respectively) are either illiterate and/or only completed elementary education.

Respondents in this category are not expected to be familiar with social media. Furthermore, there is also a limitation on using social media to target consumers with low educational levels. It is difficult to deliver detailed information on food safety risks through social media, since messages tend to be short. Moreover, there is a huge volume of information that is posted on social media, which can cause food safety messages to be 'drowned out'.

The internet was mentioned by 43 percent of respondents as a source of health information, to include online publications, websites and links, newsletters and so forth. This is practical for detailed discussions of food safety risks, and as information can easily be updated and expanded to suit different groups of people. Animation and graphic design can also be used to develop eye-catching and interesting ways to deliver messages.

Some local developers have formulated smart-phone health applications that can be used to relay information to smart-phone users. However, this is limited to small groups, and it is possible that only those who are very interested in the subject matter would download the application.

4.3.4.3 Direct and personal contact

Despite the merits of traditional and digital media, these means usually provide a flood of information on many different subjects, which may dilute the impact of media campaigns, especially when there are numerous topics of interest to audiences.

Therefore, direct personal contact with target groups could be very effective in terms of awareness-raising, influencing practices and building positive attitudes, despite limitations on the number of people who can be reached in this way, it is important to reach a range of audiences in urban, camps and rural regions.

In this regard, it is strongly recommended that information provided by public health institutions and schools is further developed; and relevant stakeholders (such as public health practitioners and teachers) are trained in order to standardize the understanding of key concepts and streamline guidance messaging.

This could be combined with posters relaying key messages related to food safety practices, and disseminating them to relevant institutions.

4.3.4.5 Community-based awareness campaigns

Community-based organizations in various localities can help organized localized awareness-raising workshops, field visits to households and other impactful activities at the community-based level. Different approaches can be followed to create effective results, including house visits by locally-trained community activists to explain issues related to food safety.

Workshops can be organized within local forums to explain issues related to food safety, and to allow for feedback on the effectiveness of these sessions. Training on food safety issues should be provided to local community organizations and activists, as well as presentation and communication skills. Local community-based organizations and health NGOs have wide outreach otential and can involve their partners in carrying out these important interventions.

Awareness raising activities should happen in healthcare clinics and centers, where physicians, nurses, caregivers and others can be trained to deliver messages to their patients. Furthermore, word of mouth was noted as a highly-effective method by various target groups, suggesting that forums for informal talks and experience-sharing between multiple groups could be highly effective tools for awareness raising.

4.3.4.6 Awareness campaigns at schools

These can be implemented by partnering with the school health unit at the MoE in order to train teachers, school administrators and caretakers. Training in food safety and hygiene could be gradually scaled-up to cover all schools.

Raising awareness at the school level, while also reaching families, can be done through in-class lessons, student-peer learning, health workshops, meetings and discussions with students and their parents, and the staging of plays on issues related to health and food safety.

This could also be expanded to higher education institutions. Food safety awareness-raising in schools is a form of learning in which the KAP of students can be transformed through teaching and training.

4.3.5 Coordination with others

Raising awareness and influencing practices on food safety issues must include supply-chain intermediaries (such as food industries, wholesalers and retailers) and public health organizations (governmental, NGOs and international agencies).

Raising awareness needs a coordinated effort to 'get things moving'. It is crucial for relevant stakeholders to establish a network in order to coordinate efforts regarding results-oriented awareness campaigns. This should include the active participation of international health-related agencies, governmental and non-governmental organizations, consumers' community leaders and others who should lead such campaigns at the national level.
Collaboration, experience-sharing and feedback from stakeholders help to maximize the effectiveness and impact of communications in a variety of ways. It enhances public trust and the public's willingness to accept messages and adhere to correct practices.

Cooperation with key stakeholders over the long-term is crucial for the effective transformation of awareness and practices related to safe food handling and consumption.
All communication materials should be collectively developed and shared for the benefit of the whole community. Coordination must take into consideration organizations that have overlapping interests and who are willing to participate in awareness campaigns.

This will help in reaching a wider target audience, while also lending more resources. Such partners could include WHO, UN Women, UNICEF, Palestinian ministries (Ministry of Health, Ministry of Education and Standards Institute), health sector NGOs, community-development NGOs and women's NGOs.

Finally, achieving significant positive change on different levels of food safety will require continuous, coordinated long-term efforts. Otherwise, any progress made will be temporary, coming to an end when activities associated with such awareness campaigns end.

4.3.6 Implementation tasks

Formulating and launching awareness-raising campaigns requires several activities and steps, as outlined below:

- Organization: Initiate contacts with potential partners and establish a coordination mechanism to discuss and agree on campaign objectives as well as expected outcomes and anticipated changes in the behavior of target audiences. Agreement must also be reached on quantitative and qualitative performance indicators, campaign activities, timeline, deadlines, budget allocation and distribution of responsibilities and resources.
- Establishing a steering committee for the whole campaign: this committee should assume accountability for campaign implementation and should include subject-matter experts in food safety, public health and communications, as well as representatives of partners and nominated experts.
- Sign memoranda of understanding with:
- Partners who will contribute to the campaign
- Ministry of Education, to organize roles and responsibilities for the training of teachers and school management and for the roll-out of awareness campaigns at schools and institutes of tertiary education
- Ministry of Health, to review and approve the campaign's technical contents, facilitate work with retail outlets and organize the utilization of primary-care clinics and their health practitioners
- United Nations Relief and Work Agency for Palestine Refugees (UNRWA), to ensure the inclusion of UNRWA-operated schools and health facilities
- Finalize campaign objectives with partners, to include key messages for each targeted sub-group and key performance indicators for future measurement.
- Subcontract an advertising agency to design and undertake a media campaign, selecting the most effective media outlets, in view of time and budget limitations. This should include establishing a clear description of the best ways to reach sub-groups of the targeted audience.
- Subcontract social media and content development specialists (companies or individuals) to design, implement, update and follow-up on digital media campaigns.
- Subcontract a group of NGOs to work with community-based organizations to train and supervise personnel for the implementation of localized awareness-raising campaigns.
- Subcontract an evaluator (NGO or firm) to continuously monitor, evaluate and report on the performance of the campaign across its various work-streams.

4.4 References

Palestinian Central Bureau of Statistics. 2011. Expenditure and Consumption Survey (p.59), Ramallah-Palestine, 156 pages. (available at: www.pcbs.gov.ps/Downloads/book1899.pdf)

Palestinian Central Bureau of Statistics. 2015. Labor Force Survey (p.128), Ramallah-Palestine, 136 pages. (available at: www.pcbs.gov.ps/pcbs_2012/Publications.aspx)

WHO. 2006. Five Keys to Safer Food Manual. France. 28 pages.
(available at: www.who.int/foodsafety/publications/consumer/manual_keys.pdf)

WHO. 2015. Estimates of the Global Burden of Foodborne Diseases. Switzerland. 255 pages.
(available at: www.who.int/foodsafety/areas_work/foodborne-diseases/ferg/en/)

USDA. 2007. Best Ways to Clean Kitchen Sponges.
(available at: www.ars.usda.gov/news-events/news/research-news/2007/best-waystoclean-kitchen-sponges/)

USDA. 2013 Food Safety Fact Sheets.
(available at: www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/getanswers/food-safety-fact-sheets)

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