



For a world without hunger

Welthungerhilfe (WHH) Iraq Project IRQ-1016

Minimum Dietary Diversity Score for Women (MDDS-W) Report

Prepared by: Christina Lunt (Junior Expert Nutrition & Partner Coordination)
Verena Donislreiter (Junior Expert MEAL)

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Table of Contents

Acronyms	3
Executive Summary	4
Introduction.....	4
Methodology.....	4
Sampling method	5
Sample size and sub-districts	6
Research Limitations	7
Security Situation.....	8
Demographics and household information	8
Age.....	8
Household size and Head of Household education	8
Food preparation	8
Involvement with Mercy Hands or Welthungerhilfe	9
Minimum Dietary Diversity Score for Women	9
Main food group consumption	11
Additional groups	12
Food availability and access.....	13
Animals and livestock.....	13
Agricultural land	14
Own Processing and Storage	16
Markets.....	17
Drinking water access.....	18
Health and hygiene	18
Iraq health nutrition policies	19
Conclusion.....	19
Annex 1 Food examples	22
Annex 2 Differences in food consumption for those above or below the threshold of five food groups (10 food groups)	27
Annex 3 Differences in food consumption for those above or below the threshold of five food groups (additional food groups)	28
Annex 4 Households processing foods for home consumption during seasonal gaps	29
Annex 5 Households storing foods for home consumption during seasonal gaps	30

Acronyms

FAO	Food and Agricultural Organisation
HH	Household
HoH	Head of Household
IDP	Internally Displaced Person
IED	Improvised Explosive Device
ISIS	Islamic State of Iraq and Syria
MDDS-W	Minimum Dietary Diversity Score for Women
MoH	Ministry of Health
SDGs	Sustainable Development Goals
SFNS	Sustainable Food and Nutrition Security
WHH	Welthungerhilfe
WHO	World Health Organisation
WRA	Women of Reproductive Age

Executive Summary

As a part of the project, “Establishment of sustainable livelihoods for returnees, IDPs and vulnerable host community members in Ninevah Province, Northern Iraq”, the Minimum Dietary Diversity Score for Women assessment is used to reflect micronutrient adequacy as a key dimension of diet quality. By measuring the number of food groups that women of reproductive age consume in the previous day, the results are used to estimate the micronutrient levels of the population.

The assessment was conducted with 196 women across four sub-districts in Hamdaniya, Iraq, in October 2018, using the standard questionnaire format of the FAO, adopted to the country context and including additional livelihood questions. The sampling method and size was mainly restricted by access and security constraints, which in turn inhibits a risk of introducing a positive result bias as the most unstable areas could not be accessed for the survey.

The assessment showed that slightly over half of the women of reproductive age consumed foods from at least five food groups a day and achieved a satisfactory level of dietary diversity. Dietary diversity was lowest among women in Nimrud, the sub-district with the most volatile security situation in Hamdaniya. In contrast, nutrition scores were highest for women whose households engaged in food processing and storage.

Analysing the results within the wider Sustainable Food and Nutrition Framework and its four pillars; food availability, access, use and stability, it is clear that stability, determined by overarching political and security factors, has a major impact on the other three pillars and thus, nutrition outcomes.

Introduction

The Minimum Dietary Diversity Score for Women (MDDS-W) was conducted as part of Welthungerhilfe’s (WHH) project IRQ-1016 “Establishment of sustainable livelihoods for returnees, IDPs, and vulnerable host community members in Ninevah Province, Northern Iraq” to assess the dietary diversity of women of reproductive age in the project area of Hamdaniya. The indicator is part of the standardised set of Welthungerhilfe’s indicators and aims to assess the overall organisation’s performance in its core mandate to end hunger by 2030 in line with the Sustainable Development Goals (SDGs).

The project IRQ-1016 is implemented in Ninevah Province with a focus on livelihoods and agriculture, including home gardening activities and nutrition trainings for women. The assessment of women’s dietary quality is of interest to inform the steering of the scope of the planned nutrition trainings in Hamdaniya.

The MDDS-W covers women of reproductive age as respondents due to their generally higher vulnerability to insufficient nutrition intakes. This is due to the cultural norm of women usually eating last in the family and their increased nutritional requirements in times of pregnancy and lactation. The MDDS-W is a proxy to measure the food group diversity to reflect micronutrient adequacy as a key dimension of diet quality. The MDDS-W tells us the proportion of the target population whose diet is sufficiently varied, meaning it meets the requirement of including at least 5 food groups.

The survey was conducted from 3rd-15th October 2018 as a baseline and should be repeated after one year. Because of seasonal deviations and to make sure data sets are comparable, the second survey should be conducted in the same month, i.e. October 2019.

Methodology

The survey was conducted in Hamdaniya district, Iraq, with a sample size of 194 women of reproductive age (WRA) between 15 and 49 years of age. The survey questionnaire is based on the guidelines of the FAO and adapted to the country context of Iraq. The questionnaire covers 10 different food groups and asked respondents to recall all foods they ate within the previous 24 hours. The open-recall method is

combined with rigorous probing of different foods to ensure that information received is complete. The 10 food groups are:

1. Grains, white roots and tubers
2. Pulses
3. Nuts and seeds
4. Dairy
5. Meat, poultry and fish
6. Eggs
7. Dark green leafy vegetables
8. Other vitamin A-rich fruits and vegetables
9. Other vegetables
10. Other fruits

The ten food groups above are mutually exclusive, meaning, no food or ingredient is placed in more than one food group.

There are also optional categories added to the questionnaire, that are not used in the final indicator calculation. The categories added were:

11. Other oils and fats
12. Savoury and fried snacks
13. Sweets
14. Sugar sweetened beverages

Further, these categories are also required:

15. Condiments and seasoning
16. Other beverages and foods

The rationale for including both the optional and required categories is that some of these categories are of interest in the context of the nutrition transition, while other categories are included primarily to provide a place for enumerators to mark each food and to avoid falsely classifying items into one of the ten MDDS-W groups. The “condiments and seasonings” category contains diverse foods and ingredients and is designed to avoid allowing foods consumed in very small quantities to “count” in the MDDS-W indicator.

The survey questionnaire was tested for its validity from 26th to 30th August 2018 and adapted correspondingly as necessary.

It was conducted from 3rd October to 15th October 2018 by six trained, female enumerators, working in pairs of two. Each interview took around 40 minutes to complete. The enumerators participated in a comprehensive 1-day training on the survey methodology and data collection process in Erbil on 2nd October 2018.

The enumerators used Kobo toolbox to collect data, combined with a paper-based food group table where foods could be recorded by the enumerator and coded into the electronic Kobo questionnaire at the end of each interview. This method is recommended by the FAO in their Measurement Guide¹ and allows for more comprehensive probing by the enumerator. Annex 1 provides an overview of the foods and meals categorised under each of the categories.

Sampling method

The sampling options are heavily limited due to the volatile security situation in the survey area and lack of recent census data. Random probability sampling methods are not feasible due to impeded access to certain areas for security reasons and the unavailability of establishing accurate primary sampling units to create a sample frame from which to select households. As a result, this survey resorted to non-probability sampling and employed the random walk sampling technique for household selection as

¹ FAO and FHI 360 (2016). Minimum Dietary Diversity for Women: A Guide for Measurement. Rome. FAO.

further described below. For village selection, three villages were chosen proportionally from each of the four sub-districts of Hamdaniya district, which are Hamdaniya sub-district, Bartella, Nimrud, and Bashiqa, on the grounds of accessibility and security. This introduces a bias towards assessing villages in more stable, accessible and safe areas, which show different nutritional values under the given conditions. The security situation is further elaborated on page 7.

In the random walk approach, households were selected by the enumerators on the spot, starting from a designated central point in the village and choosing every fifth household. The direction was determined at random by spinning a pen. The benefits of this household sampling strategy are its fast and practical implementation on the ground but comes with the limitations of a non-probability sampling approach, meaning that not all households have an equal chance of being selected.

The intra-household selection of female respondents was done under a stratified convenience sampling approach, based on age to include females across all eligible age ranges and account for the age-based hierarchy system found in the area under study. Respondents were proportionally selected from three different age groups 15-24, 25-34, and 35-49, as available for the interview. Parental permission was required for female respondents under the age of 18. Surveys were also conducted across all days of the week, as different eating patterns throughout the week reflects normal overall eating patterns. Due to the constraints in time and resources for the survey and therefore survey scope, this sampling approach was deemed feasible and inclusive of possible deviances between age ranges.

Sample size and sub-districts

The initial sample size was calculated with a 95% level of confidence and an error margin of 8% based on a sampling unit of 15,000 households in Hamdaniya district. This equated to 149 surveys and was rounded to 164 surveys to ensure even coverage between the four sub-districts. Due to severe constraints in time, resources, and access, it was not feasible to calculate with an error margin of 5%, as usually applied by WHH. Also, efforts were made to restrict the number of interviews as much as possible to avoid over-surveying of the target area while still ensuring valid research findings. These efforts to restrict the number of interviews stem from the recent recognition that the target area was heavily surveyed by different humanitarian actors in recent months, raising major ethical concerns and contributing to reluctance of respondents to participate in any further research activities as well as governmental authorities to permit assessments to take place. Local authorities have even gone as far to put a temporary freeze on data collection in these areas.

Unexpected efficiency when conducting the surveys meant that the final number of surveys increased to 196. This equates to a sample size with a 95% level of confidence and error margin of 7% based on a sampling unit of 15,000 households in Hamdaniya district. This number is an estimate from a recent assessment² conducted in the area, as up-to-date census data is not available for Iraq with the latest census taken place in 1987.

The number of selected survey locations across the four sub-districts of Hamdaniya is illustrated in Table 1 below, and the village locations covered in this survey are displayed in the following map (Figure 1).

Table 1 Sampling size & breakdown per location in Hamdaniya district

Sub-district	Village	Households interviewed	Total households interviewed per sub-district	Overall total of household interviews
Nimrud	Ibrahim Alkhaleel	16	46	
	Kani Harami	13		
	Shanaf	17		
	Bartella center	17		

² ACTED, Mercy Hands, People in Need & Welthungerhilfe, Agriculture and Livelihoods Needs Assessment Report – Hamdaniya District (August 2018).

Bartella	Basekhra	17	51	196
	Tahrawa	17		
Bashiqa	Al-Darawish	16	47	
	Tiskhrab	15		
	Baybokht	16		
Hamdaniya	Hamdaniya center	17	52	
	Shekh Ameer	18		
	Karemles	17		

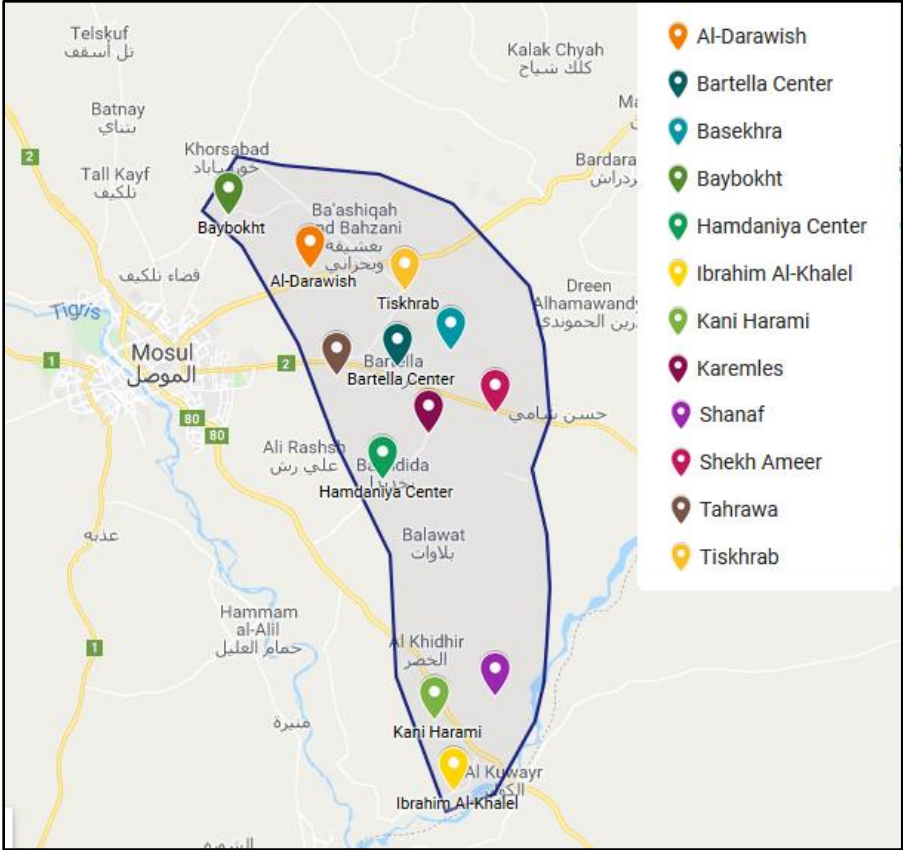


Figure 1 Map of surveyed villages

Research Limitations

The limitations of this survey include the restricted sample size which resulted from severe constraints in resources and time, as well as from realising the recent heavy over-assessment in the target area. This means that the results of this survey cannot be generalised across the overall population but are instead indicative of the population within Hamdaniya district. Also, due to security and access constraints, there is the risk of introducing a bias through excluding villages of high insecurity.

An important factor that needs to be considered in analysing the survey results is seasonality which might heavily impact the availability and consumption of certain food types. Furthermore, the quality of data might be inhibited by the ability of respondents to recall over a 24-hour period. As a mitigation method, the enumerators used probing, also of food consumed outside the home. Mixed dishes and classification of ingredients still pose a particular challenge but were covered in depth in the enumerator training.

Security Situation

In January 2018, ISIS was announced as being defeated in Iraq. However, sympathisers remain; some in a military capacity and others hiding out. Small scale attacks continue to occur on a weekly basis and its estimated that the number of current ISIS members in Iraq is between 10,000-15,000 persons³. Internal security assessments show that whilst the situation in Hamdaniya district is stable, there are weekly reports of assaults, military searches and arrests, airstrikes, and IED discoveries, explosions and sweeps. For Welthungerhilfe staff Nimrud sub-district is off limits due to ongoing security activities in the area. Mercy Hands continue to access the area at their own risk, however data collection was halted temporarily in Nimrud due to military operations during the survey period.

Demographics and household information

Age

To ensure that the respondents represented all women of reproductive age (15-49 years), enumerators were instructed to try and request a respondent from a different age range during each interview, as was described in the methodology. The results show that a people of all ages within the desired range were reached in the survey. The average age of respondents was calculated to be 30.9 years.

Household size and Head of Household education

The majority (95%) of the respondents stated that they were returnees. The remaining 5% was equally made up of IDP and stayee households. The households ranged in size from 2 to 20 persons. The average household size was 7.6, and the average number of females of reproductive age in these households was 1.9.

Of the surveyed households, 9% revealed a female head of household (HoH). The educational status of the majority (78%) of these females is less than a high school diploma. The few that had higher educational statuses had participated in vocational trainings, and one individual held a diploma and another a bachelor's degree. Figure 2 compares the educational statuses of male and female HoH's. Whilst the sample of female HoH's was only 18, the figure shows that the majority of both male and female HoH's hold less than a high school degree, however higher percentages of female HoH's held had participated in vocational trainings or held a diploma or bachelor's degree.

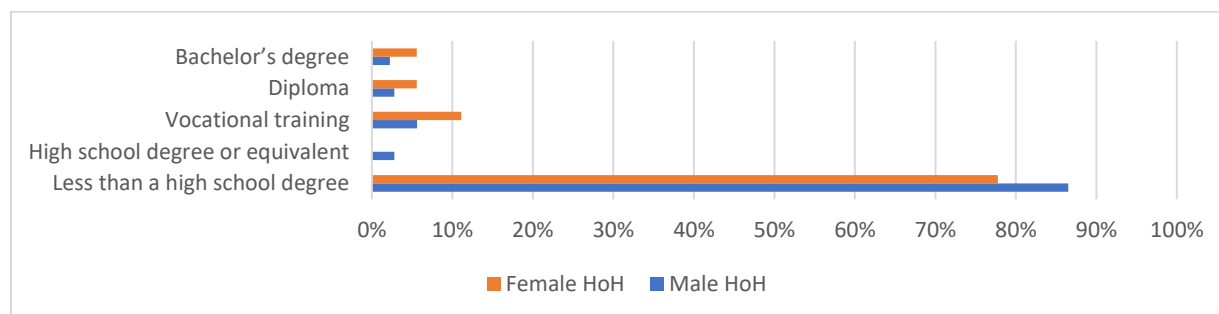


Figure 2 Educational status of male and female heads of household (%)

Food preparation

It is assumed that by targeting females of reproductive age that they are also those responsible for or involved in household food preparation. The survey showed that in 85% of responses that the females were either responsible, or partially involved in the household food preparation. Of those that responded they were not involved, there is a correlation between age and household responsibility. Figure 3 shows that respondents aged between 15-17 years were less likely to be involved in food preparation. From the age of 22 it seems that the responsibility of females to prepare food becomes greater.

³ OCHA, 2019 Iraq Humanitarian Needs Overview, November 2018

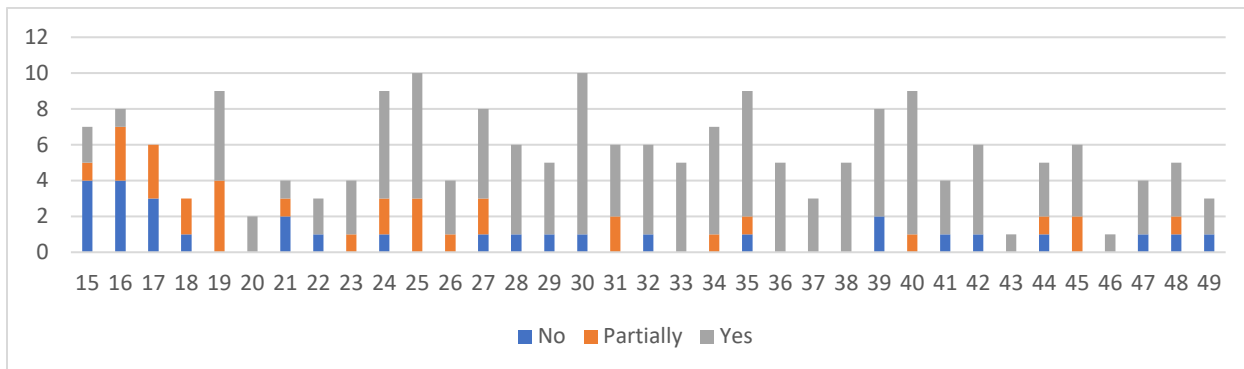


Figure 3 Age of respondents and their involvement in household food preparation

Involvement with Mercy Hands or Welthungerhilfe

All surveyed stated that they had not been a project beneficiary of Mercy Hands or Welthungerhilfe.

Minimum Dietary Diversity Score for Women

The Minimum Dietary Diversity Score for Women (MDDS-W) is developed as a proxy indicator reflecting the micronutrient adequacy of women' diets, used mainly at national and subnational levels. It is a population-level indicator, so although the data is collected from individual women, the indicator cannot be used to describe the diet quality of an individual woman. This is because of normal day-to-day variability in individual intakes.

When groups of women of reproductive age consume food from at least five of the ten food groups, they are likely to have a higher micronutrient adequacy than other groups that have a lower proportion of women achieving the threshold of food items from at least five groups.

Analysis of the results show that 55% of the respondents achieved minimum dietary diversity, as shown in Figure 4. When broken down to sub-districts, Bashika had the highest percentage of HH's achieving dietary diversity (64%), followed by Hamdaniya (61.5%). Nimrud showed the poorest results with under half of the respondents (41%) achieving dietary diversity.

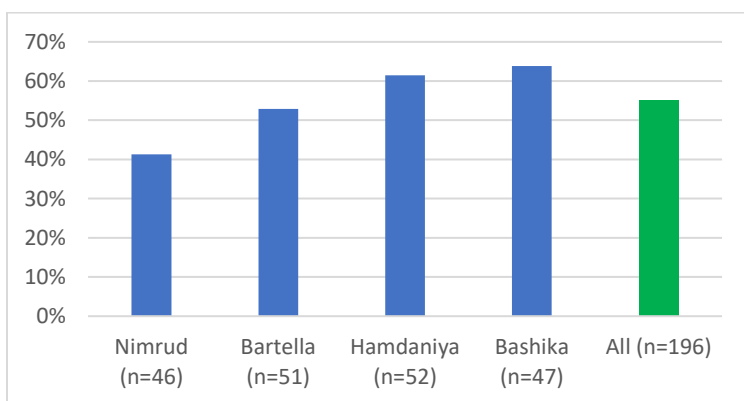


Figure 4 Percent achieving Minimum Dietary Diversity for Women of Reproductive Age (MDD-W) (≥5 food groups in the day prior)

The average number food groups consumed in Hamdaniya district was 4.8, under the recommended minimum of five food groups. In Bashiqa and Hamdaniya sub-districts, both achieved an average of slightly above five groups. Whilst Bartella and Nimrud were on average consuming 4.6 and 4.2 food groups respectively (Figure 5).

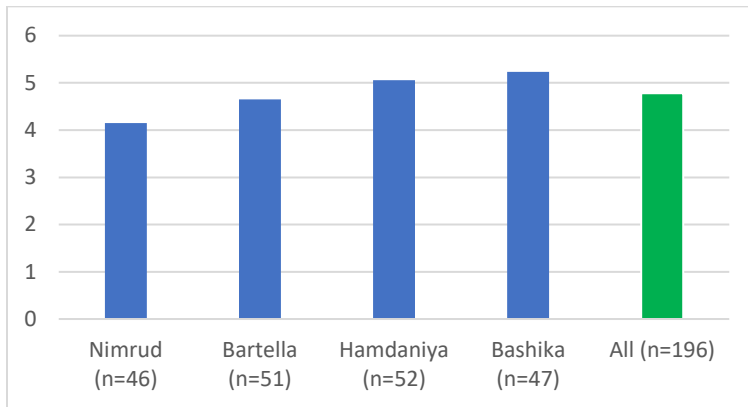


Figure 5 Mean number of food groups in the day prior

The frequency of the results is shown below in Figure 6. Five food groups were the most frequently achieved score, followed by 4 food groups. There were a few outlying cases where >7 food groups were consumed, or ≤ 2 food groups were consumed, however in general the results were most commonly between 3 and 7 food groups. Those women consuming foods from five or more food groups have a greater likelihood of meeting their micronutrient needs than women consuming foods from fewer food groups.

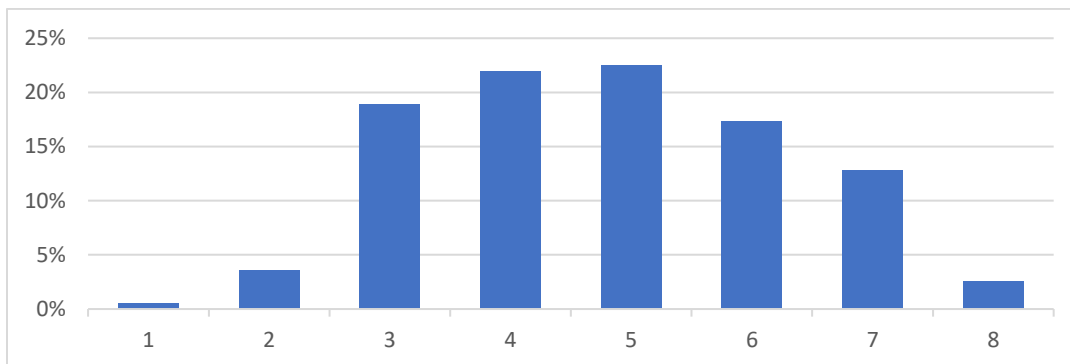


Figure 6 Food group diversity scores for yesterday (out of 10 groups)

To assess whether there is a relationship between the MDDS-W and age of the respondent, the average score for each age was calculated. Figure 7 shows that there is no obvious pattern, the results fluctuate. The highest and lowest results seen at ages of 43 and 46 were calculated based on single respondents. However, in most instances the results can be seen the hover between the 4-5 score range.

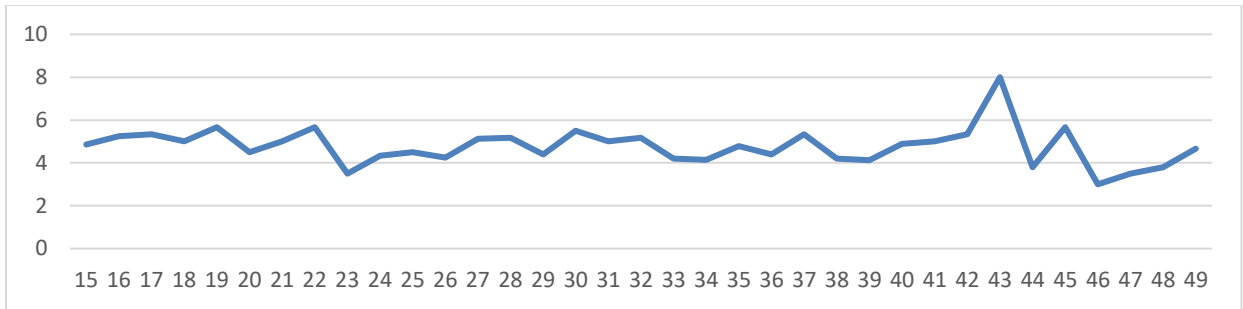


Figure 7 Average MDDS-W across the ages

Main food group consumption

The most frequently consumed food groups are shown in Figure 8. The category of grains, white roots and tubers, was consumed in the previous day by 97% of the respondents. Vegetables and dairy were the next most frequently consumed. Vitamin-A rich fruit and vegetables were the least frequently consumed food group, followed by dark green leafy vegetables.

Within the Vitamin-A rich fruit and vegetable group, there were very limited food options that are available in Iraq. The foods available in this category are carrot, pumpkin, red pepper (sweet), apricot, cantaloupe melon, peaches and persimmon. The small percent of respondents (all less than 40%) consuming dark green leafy vegetables, pulses and nuts and seeds is unexpected due to the prevalence of all in country.

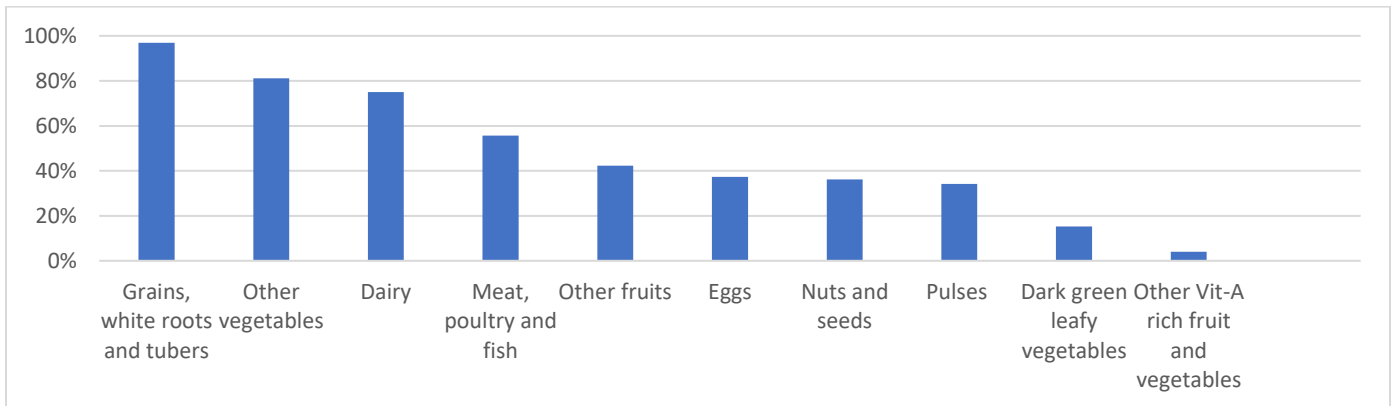


Figure 8 Percent consuming nutrient rich foods yesterday

In Figure 9 below, the food group responses are broken down further to sub-district. Respondents in Nimrud showed consistently lower responses in seven of the ten groups. The exceptions are pulses, dairy and Vitamin-A rich fruit and vegetables categories, where the Nimrud respondents consumed the greatest percentage out of all sub-districts.

Only the categories of grains, white roots and tubers, dairy, and other vegetables were consumed by more than half of all respondents in each sub-district. The differences in food consumption for those above and below the five-food group threshold are broken down further in Annex 2.

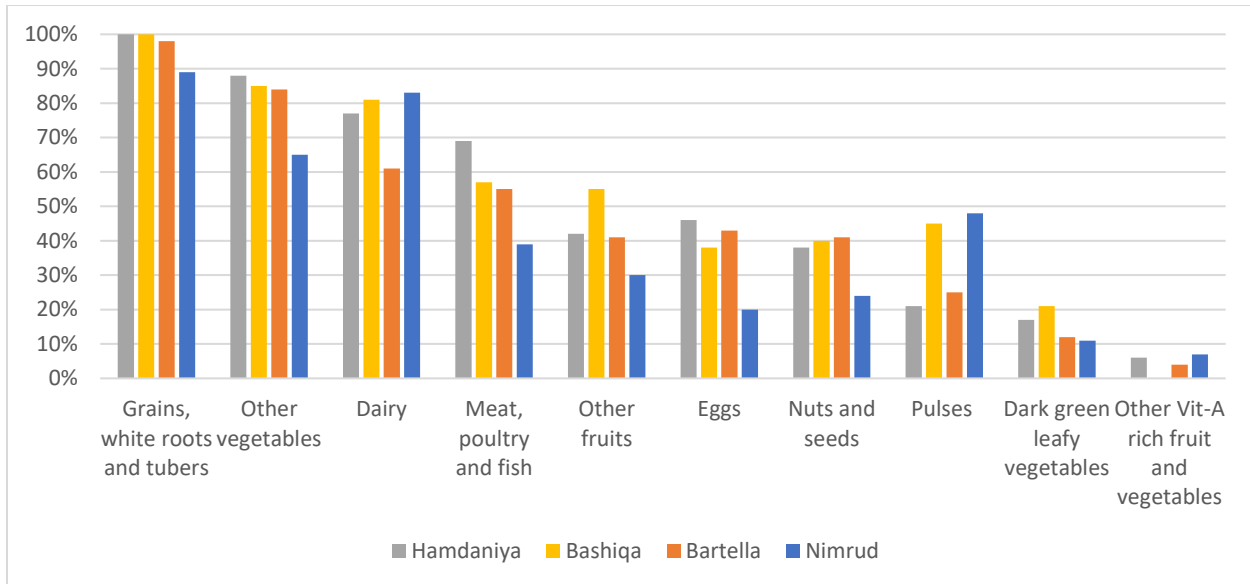


Figure 9 Percentage of food groups consumed, disaggregated by sub-district

Additional groups

In addition to the 10 food groups used to measure micronutrient adequacy in women, food categories of oils and fats, savoury and fried snacks, sweets, sugar sweetened beverages, condiments and seasoning and other beverages and foods, were added to capture a more complete picture of the consumption patterns in Hamdaniya.

By including these categories, the proportion of women consuming high fat, nutrient-poor and energy-dense foods can be estimated. It's particularly useful in high poverty areas where fat consumption is considered too low, and to provide enumerators with a section to record the ingredients when mentioned in mixed dishes.

Figure 10 shows that in all sub-districts sugar sweetened beverages such as tea with sugar, coffee with sugar, fruit juice and soft drinks, were consumed by most respondents. Condiments and seasoning, such as spices, flavourings, or other foods consumed in a quantity of less than one tablespoon, and oils and fats such as solid and liquid oils and fats of both plant and animal origin and high fat dairy products, were consumed by almost all respondents in the sub-districts of Bartella, Bashiqa and Hamdaniya. Nimrud was the clear exception, with only 28% of respondents consuming oils and fats, and only 20% using condiments and seasonings. In the sugar sweetened beverages category, Nimrud respondents consumed the highest percentage, while in all other categories they consumed the least or below average.

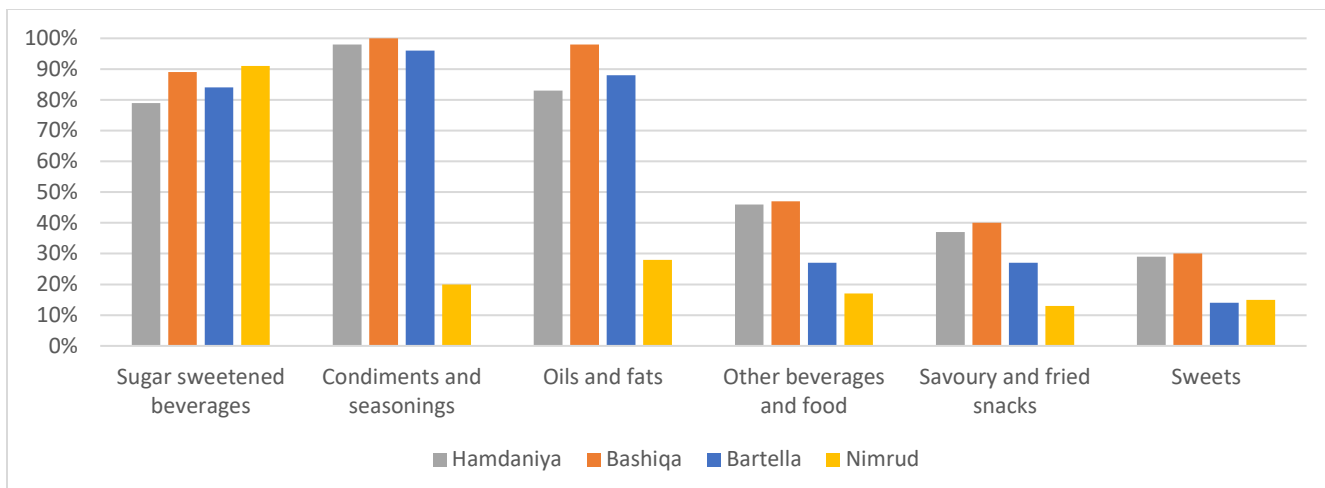


Figure 10 Percentage of additional food categories consumed the day prior

Annex 3 presents a more in-depth view into the proportionate number of respondents consuming from these additional food categories, combined with the five-food group threshold.

Food availability and access

To better understand the household food security, the respondents were asked about their access to food, either through own production or through purchases. Land and livestock can have two functions in a household; to generate income and serve as a food source.

Animals and livestock

The responses showed that only 66 HH's (34%) owned poultry, livestock or rabbits. Poultry was owned in 91% of these responses.

The categories of animals owned are broken down further in Figure 11. Chickens are most commonly owned, in all sub-districts. This is confirmed in a recent needs assessment report conducted⁴. In Nimrud, turkey was owned only in two HH's and one HH revealed they owned bees and were producing honey. However, based on the results, beekeeping does not seem to be prevalent in Hamdaniya district.

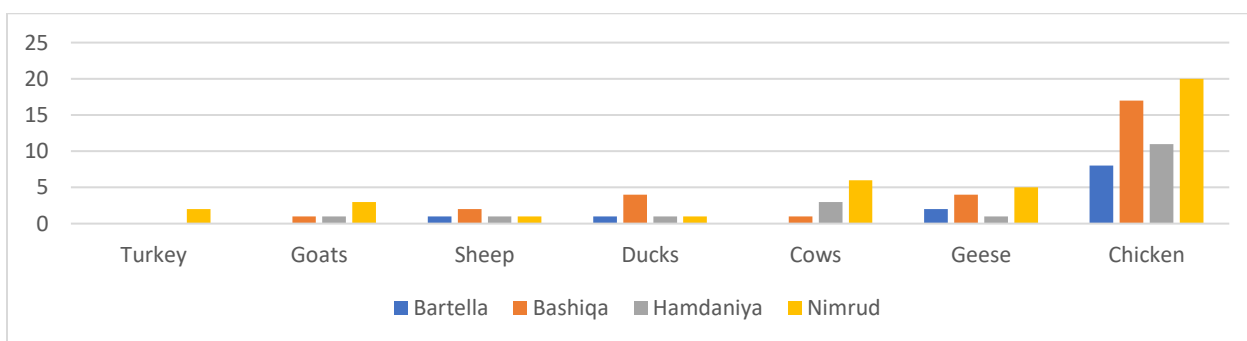


Figure 11 Number of households owning poultry and livestock, disaggregated by sub-district

The households were then asked what products they were consuming from the animals owned. Approximately one-third (35%) of animal owning households stated that they do not consume any

⁴ ACTED, People in Need, Mercy Hands and Welthungerhilfe, Agriculture and Livelihood Needs Assessment Report – Al-Hamdaniya District, August 2018.

products from their animals. The reasons why were not asked in this assessment, but an understanding would be useful if trying to increase production through project activities.

Those households who did not own any poultry, livestock or rabbits were asked, “why not?”. The most frequent response was that they did not have any land, followed by that the ongoing costs associated with keeping animals was too high (Figure 12). Nimrud was the only sub-district in which the reason of “no land”, was not the most selected. Instead, high investment costs were preventing most respondents in Nimrud. An additional 16 responses specified other reasons which included that their area was residential and not suited to animals, there was no time to manage animals, or that they simply didn’t want to own animals.

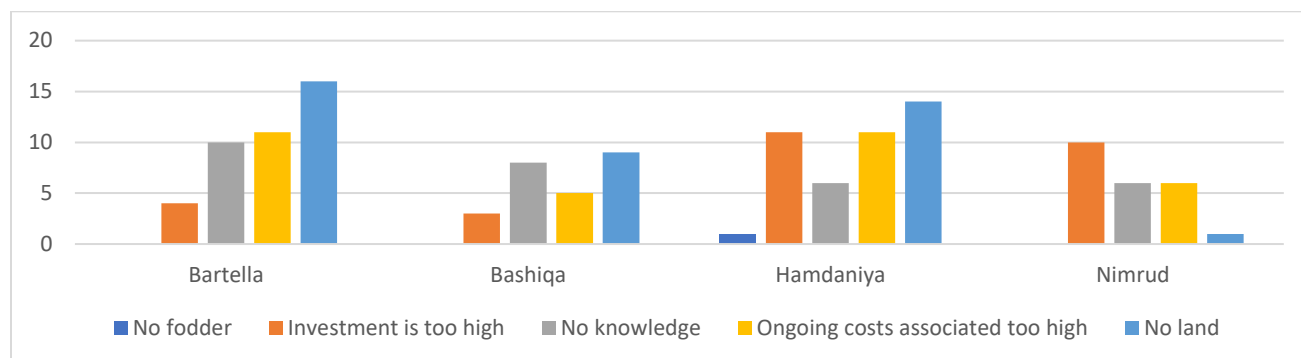


Figure 12 Reasons for not owning poultry or livestock

Further analysis into the relationship between the MDDS-W and households owning poultry or livestock does not indicate any correlation (Figure 13).

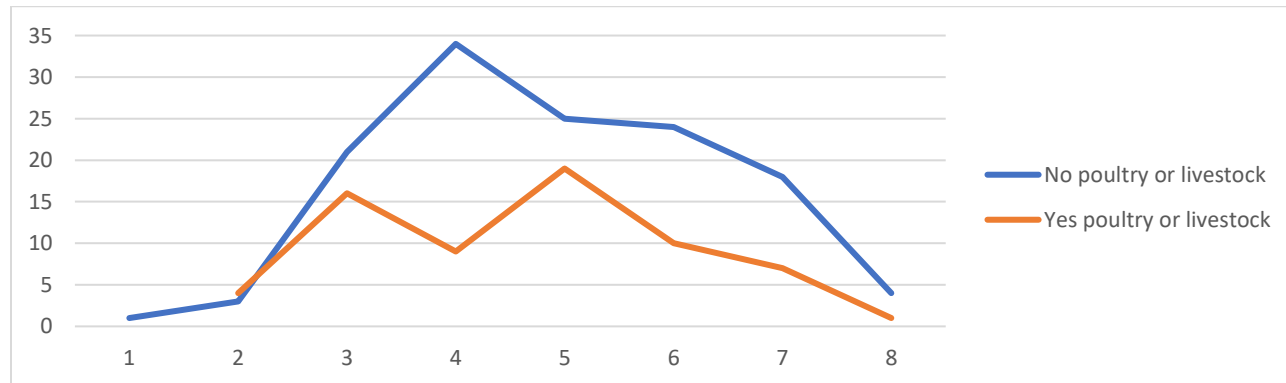


Figure 13 MDDS-W comparatively to number of HH's with poultry or livestock

Agricultural land

Home gardens and agricultural lands were prevalent in only 33% of households (64 HH's) (Table 2). Home gardens were much less prevalent in Hamdaniya, comparatively to the other sub-districts, while Bartella and Bashiqa revealed home gardens to be much more prevalent compared to agricultural land. The remaining 132 households stated they had neither a home garden or agricultural land.

Of those with land, only 58% stated that they were producing food. Within this 58%, 31 households said that the food was for own consumption, five households were selling their produce and one was producing for both own consumption and sale. Twenty-six respondents stated that they were producing

nothing on their land. A lack of water for irrigation could be a possible explanation, as rainwater was said to be the primary source of water in 62% of households⁵.

Table 2 Households with a home garden and/or agricultural land

Sub-districts	Yes, home garden	Yes, agricultural land	Yes, to both types
Bartella	14	1	0
Bashiqa	13	1	0
Hamdaniya	6	8	1
Nimrud	13	6	1
Total	46	16	2

Corresponding to the Needs Assessment Report⁶, vegetables are most produced in Nimrud and fruits are produced most in Bashiqa (Table 3). Pulses were reported as being produced only in Nimrud, however the previously mentioned report revealed that they are produced in consistently low frequencies in all sub-districts. With the exception of wheat and barley, all crops are produced mainly for own consumption. Those growing wheat and barley revealed they were selling 83% and those producing vegetables were selling 7%.

Table 3 Crops grown in each sub-district

Sub-district	Vegetables	Fruits	Wheat/barley	Oil seed crops	Herbs	Pulses
Bartella	7	1	0	2	0	0
Bashiqa	8	6	0	4	0	0
Hamdaniya	4	1	3	0	2	0
Nimrud	9	0	3	0	2	2
Total	28	8	6	6	4	2

When asked about the causes of production loss, 69% of the respondents stated they have experienced no losses. Whilst this is technically unlikely, perhaps they don't recognise their loss as being substantial enough to report. Pests and diseases (13 HH's) was revealed as the top reason for losses, followed by insufficient water (5 HH's) and poor-quality seeds (3 HH's). Time constraints and a lack of suitable storage space were only given as responses in single instances.

The households that stated they do have land for crop production (27 HH's), but are not using it for production gave the reasons that the ongoing costs were too high (25%), they had no knowledge on how to produce (21%), their gardens were for flowers not food (18%), they had no equipment (18%), the investment is too high (14%) and one respondent who simply didn't want to grow anything on their land.

Figure 14 does not indicate that there is any kind of positive correlation between land use for agriculture and the MDDS-W.

⁵ Ibid

⁶ Ibid

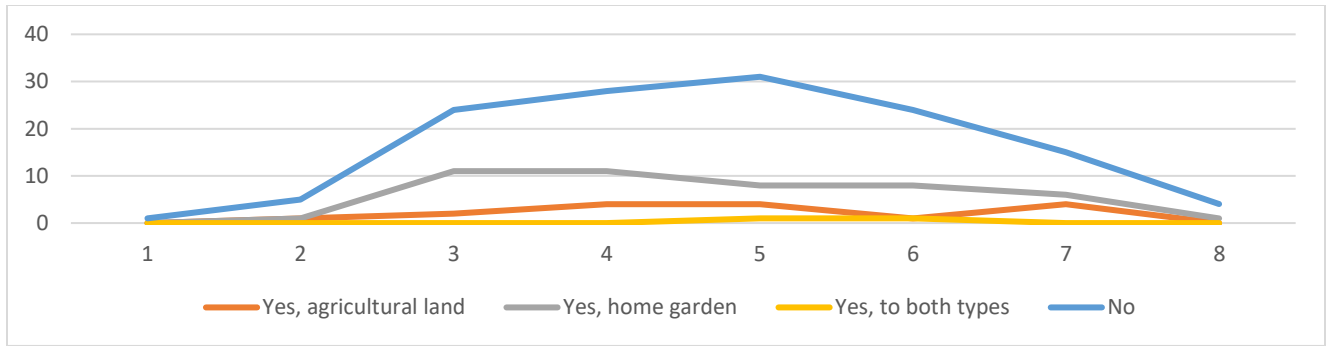


Figure 14 MDDS-W compared to HH's with household gardens or agricultural land

Own Processing and Storage

Respondents were asked if they were processing foods for seasonal gaps, and if they were storing foods for seasonal gaps.

A total of 46 households, equating to almost 25% of respondents surveyed, revealed they were processing food for periods of seasonal gaps. The majority of these were pickling vegetables or olives.

When the figures are compared against the MDDS-W, the households that stated that they did process their foods for seasonal gaps showed a greater proportion of them achieving a score ≥ 5 food groups, as shown in Figure 15. Annex 4 shows the breakdown of scores at the sub-district level.

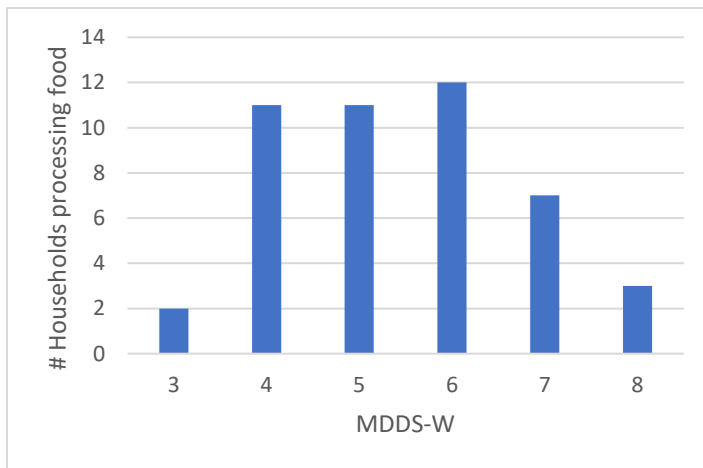


Figure 15 Households processing foods for seasonal gaps, disaggregated by MDDS-W

The number of households storing food for seasonal gaps was higher, present in 42% (82 households) of those surveyed. In general vegetables are frozen and dry products such as flours and pulses are stored in cool, dry places. As above, when the households storing food are compared against the MDDS-W, there are more households storing food and achieving a score of ≥ 5 food groups, than those scoring less than 5 groups (Figure 16). Annex 5 shows these results disaggregated to sub-districts.

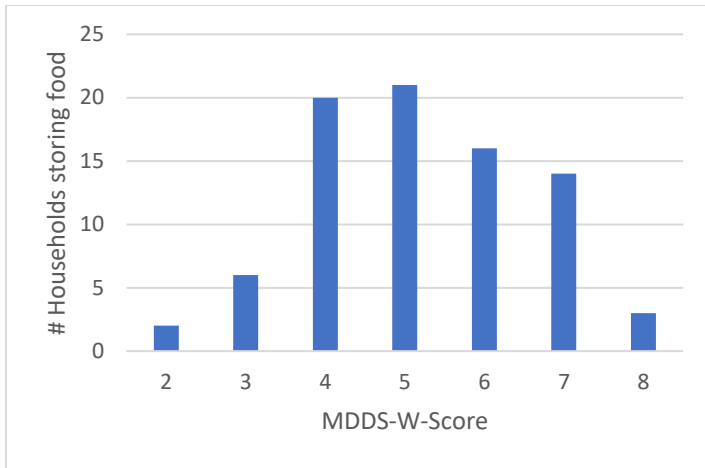


Figure 16 Households storing foods for seasonal gaps, disaggregated by MDDS-W

Markets

All but one respondent stated that they have access to a functioning market. The market was defined as the place where they could purchase their staple foods. Figure 17 shows that in Bartella the closest functioning market for most households was within two kilometres from home. In contrast, most Nimrud respondents stated that the closest functioning market is more than five kilometres away.

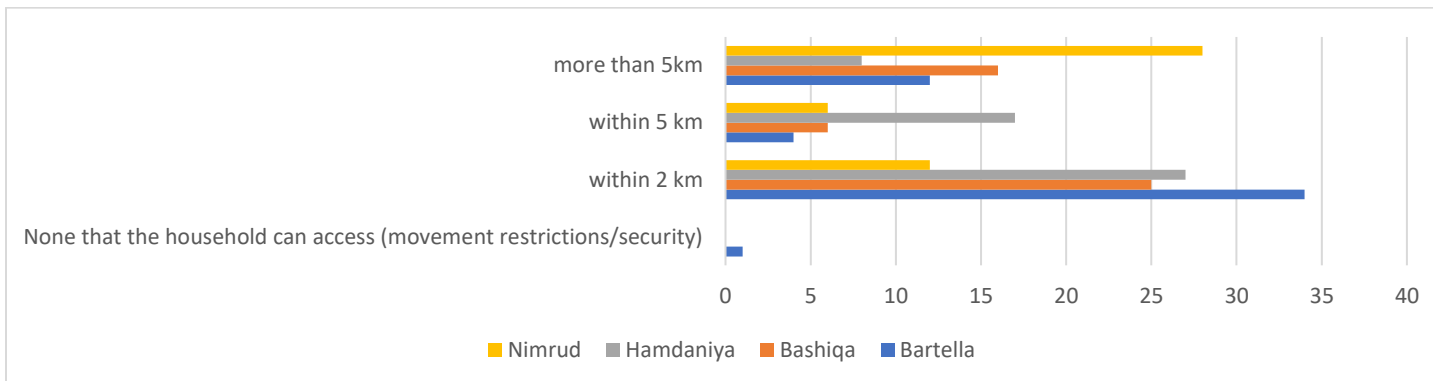


Figure 17 Distance to closest functioning market

The distance to the markets is shown in Figure 18, to compare the results to the MDDS-W. The results show that households achieving a score of 4 or more, most frequently live within 2km of the market. However, the numbers of HH's living more than 5km away are also high, and as such a conclusion cannot be made.

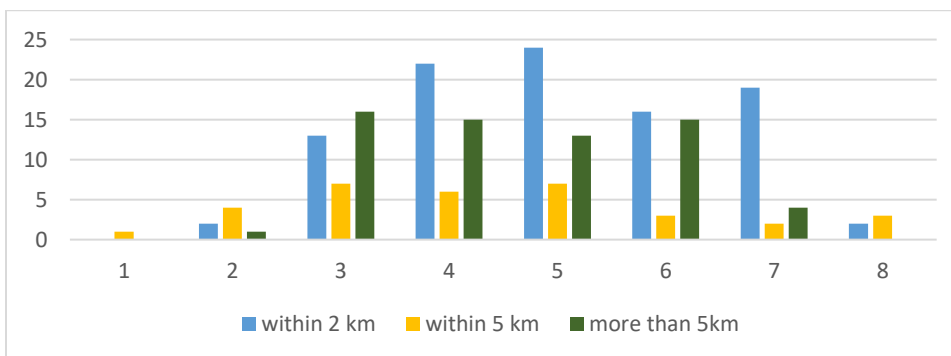


Figure 18 MDDS-W compared to the distance to closest functioning market

Drinking water access

The Needs Assessment Report⁷ revealed that household water taps or networks (including water trucking) represent the main source of drinking water for all respondents.

In this assessment respondents were asked whether they had access to either a private or shared water tank for storing their drinking water. The results showed that 90% of all households had access to a tank for drinking water storage. In Bartella, Bashiqa and Hamdaniya there were very few households not having tank access (three household in Bartella, and one in each Bashiqa and Hamdaniya). The Nimrud results stand out as 14 households stated they did not have access to a tank for drinking water storage.

Household tanks were the main type, present in 93% of the responses. Shared tanks were rare and occurred only in two instances. The others stated they had either a shared well (2 HH's) or were purchasing bottled water (9 HH's).

Despite the presence of water tanks for storing drinking water, 45% of respondents still stated that they experience drinking water shortages sometimes. The main reason given in 74% of the responses was the lack of infrastructure, followed by seasonal shortages (21%) and disruptions of the water network (5%). The seasonal shortages were all during the May – September (summer) period. Figure 19 shows Hamdaniya to be the only sub-district in which a greater number of household's experience shortages, than those who don't. Responses in Nimrud are equal, while in Bartella and Bashiqa there is a greater number of households not being affected by water shortages.

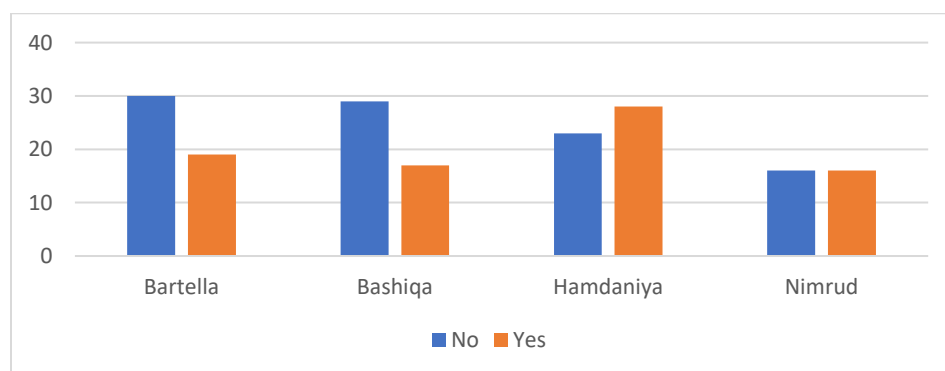


Figure 19 Households experience drinking water shortages

Health and hygiene

For people to be healthy and well nourished, the food that they eat, and the water they drink must be safe. Water can become contaminated at the source, during transportation and during storage and at the point of use. Food can become contaminated at the market and on the farm, during storage and during preparation⁸.

The respondents were asked how many children in their household under the age of five had had diarrhoea sometime in the two-weeks prior. Figure 20 shows that in 15 households in Nimrud, a child suffered from diarrhoea in the previous two-weeks. Overall the responses from Nimrud are higher compared to the other sub-districts.

⁷ ACTED, People in Need, Mercy Hands and Welthungerhilfe, Agriculture and Livelihood Needs Assessment Report – Al-Hamdaniya District, August 2018.

⁸ King, Felicity Savage, et al., eds. Nutrition for developing countries. Oxford University Press, 2015.

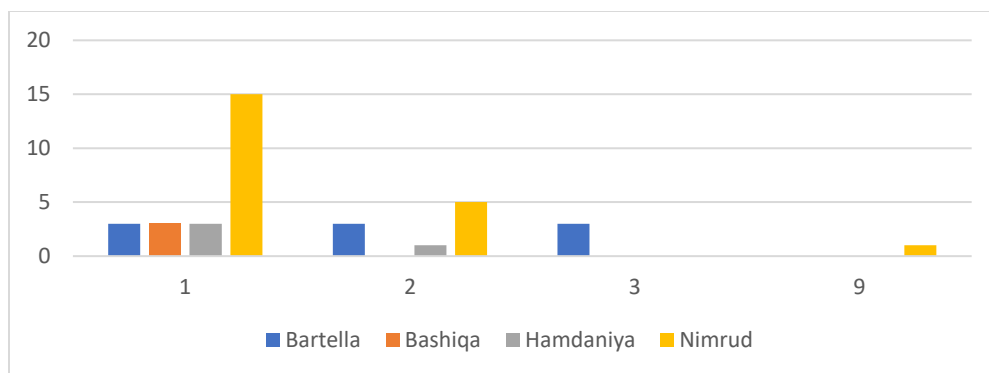


Figure 20 Number of children under 5 years with diarrhoea in previous 2 weeks

The question of diarrhoea in children was linked to a follow-up question which asked, of these children experiencing diarrhoea, how many were also exclusively breastfed until the age of six months. It is unclear if the question was interpreted as being, the number of children under five years being exclusively breastfed, irrespective of whether they had diarrhoea in the last two weeks, or perhaps respondents gave a figure of all children breastfed, irrespective of age. The clear difference between the two sets of results makes it impossible to analyse correctly. UNICEF's exclusive breastfeeding figures on Iraq show that on average less than 22% of babies are exclusively breastfed until six months of age⁹.

Hygiene items also play a role in minimising the risks of sickness and disease. The survey results show that 91% of households are using hygiene items such as soap and baby wipes. Those responding that they are not using hygiene items were from villages of Bartella Centre, Bartella (9 HH's), Shekh Ameer, Hamdaniya (7 HH's) and Shanaf, Nimrud (2 HH's).

Iraq health nutrition policies

The Ministry of Health (MoH) is the primary public institution responsible for developing national health policies. Iraq's National Nutritional Strategy 2012-2021, aims to improve the nutritional status of Iraqi people throughout the period of 2012 to 2021¹⁰. Under the strategy, the MoH has objectives of reducing the prevalence of micronutrient deficiencies and promoting nutritional health, amongst others. To achieve these objectives, the MoH identifies NGOs as key actors¹¹.

Conclusion

Sustainable Food and Nutrition Security (SFNS) is a cross-cutting concept made up of four dimensions: availability of food through agricultural production, physical and economic access to food and adequate use and utilisation of available food throughout the year (stability). An underlying cause of malnutrition is also HH food insecurity.

The **physical availability of food** is determined by level of food production and stock levels. In these survey results only 34% of HH's owned poultry, livestock or rabbits, and of these only one-third were consuming products from them. The reasons for not being involved in livestock production were mainly a lack of land, followed by financial reasons; either the ongoing costs or the initial high investment costs. A lack of knowledge was also frequently mentioned. This means that the project could consider targeting livestock owners in trainings on livestock health and management, fodder production and food processing for own consumption. Livestock distributions would also be a means of overcoming the initial high

⁹ UNICEF, Global database on Infant and Young Child Feeding, Exclusive breastfeeding, 2018

¹⁰ World Health Organisation (WHO), Global database on the Implementation of Nutrition Action (GINA), Policy – National Nutrition Strategy 2012-2021, <https://extranet.who.int/nutrition/gina/en/node/8387>

¹¹ Ministry of Health et al., The National Nutrition Strategy Iraq 2012-2021, [http://www.phd.iq/catalog/nutrition%20strategy%2012May%202012_en\(1\).pdf](http://www.phd.iq/catalog/nutrition%20strategy%2012May%202012_en(1).pdf)

investment cost barrier. However, attention should be paid to land ownership issues and the abilities of HH's to maintain and manage larger numbers of livestock.

Home gardens or agricultural land were revealed to be in 33% of HH's. Of these HH's, only 58% of those with land were producing food and mainly for own consumption. The remaining are not producing anything and gave the reasons that the ongoing costs were too high, they had no knowledge, their gardens were for flowers, they had no equipment, or the investment was too high.

The survey results showed no correlation between the HH's owning animals and their MDDS-W, nor with the HH's with home garden or agricultural land and their MDDS-W. Nevertheless, the low numbers of land owning HH's that are producing food indicates that there is room for interventions that would support and start farming activities. Activities could include the distribution of equipment such as seeds, fertiliser and tools and knowledge transfer on sustainable and resource-efficient farming practices.

The HH's that revealed they were either processing and/or storing foods for seasonal gaps did show a correlation to the MDDS-W results. A much greater proportion of the respondents who were processing or storing foods consumed five or more food groups. However, only 25% of HH's were involved in HH food processing, and 42% in storage. This suggests that project activities could focus on increasing the number of HH's engaging in food processing and storage have a stronger focus on providing the knowledge, tools and facilities needed for post-harvest management, including how to process, conserve and store food adequately to bridge seasonal gaps.

Economic and physical access to food is determined by the adequacy in supply of food, relevant to incomes, expenditure, markets and prices. Across all sub-districts, economic reasons were often given to explain why the HH was not involved in food production. Results showed that investment costs, ongoing costs and the procurement of equipment were often the restricting factors.

In Hamdaniya, all but one HH stated that they have access to a functioning market for staple foods, and no clear relationship could be gauged between the distance to market and the MDDS-W. Nimrud respondents had the highest frequency of functioning markets being located more than 5km away, however further analysis on the dietary diversity scores and the market distance did not reveal any trends. This infers that with access to functioning markets, and the majority of HH's in Nimrud reporting comparatively long distances with up to 5km, the justification for project activities related to product marketing and sale exist.

Food utilisation (and intake) is often understood as the way the body uses food to make nutrients. Components of this are health, hygiene, feeding practices, preparation, diversity and distribution of food in the HH.

The MDDS-W assessment showed that while over half of the surveyed population achieved the minimum dietary diversity score of consuming five or more food groups, 45% of the sample were revealed to be consuming less than five food groups. No guidance can be found on what a satisfactory MDDS-W result would look like, however it is known that the higher the percentage of the population consuming a diverse diet from five or more food groups, the better. Bashiqa sub-district had the highest results (64%), while Nimrud had the lowest (41%).

Interestingly the results showed that nuts and seeds, pulses and dark green leafy vegetables were the least frequently consumed food groups. As all are produced within Iraq, it would seem unlikely that supply is an issue. Instead it could be the case that they are currently consumed in quantities too small to count in the MDDS-W survey. Considering people's consumption preferences, this implies there's potential for the project to include these food types when implementing farming activities. Activities could include seed distribution and agricultural trainings. As nuts and seeds are relatively expensive at markets, promoting household production of these might be particularly fitting.

The results on health and hygiene show that there are instances of children under 5 years, particularly in Nimrud, being affected by diarrhoea. Whilst the direct causes are unknown, it could be linked to drinking

water quality, general hygiene or the low figures of exclusive breastfeeding until the age of six months in Iraq, which can impact a child's immunity to disease and infection¹². For the project, this implies several areas of possible intervention in the areas of drinking water quality, hygiene practices and promotion of breastfeeding. Further study is needed, however, to assess the causes and verify the low figures of exclusive breastfeeding.

Stability is related to external conditions of weather, political instability or economic factors of unemployment or rising food prices, all of which can impact a HH's food security status. Recent internal security reports show that Hamdaniya district is now relatively stable security wise. Nimrud sub-district is the exception to this, still off-limits for WHH employees, and frequently impacted by military operations. The survey results reflect this instability, as Nimrud residents scored the lowest consistently in the MDDS-W results, most residents were traveling more than 5km to reach the nearest functioning market, 30% of HH's don't have access to drinking water storage and they had the highest diarrhoea rates of all sub-districts. In all locations, the general loss of property and livelihoods continue to compound the problems.

This infers that overarching political and security factors significantly influence the other three pillars of SFNS, i.e. food availability, access and use, and thus nutrition outcomes. Close attention should be given to the factors outside of project control when planning interventions, by means such as risk mapping exercises. In contrast, the results imply that once these external factors improve and the security situation stabilises, the availability of food, household's access and use of it, may also improve correspondingly and lead to better nutrition results. The impact of project activities therefore needs to be considered within the wider framework of these overarching factors, instead of drawing linear causal impact chains from project activities only.

To improve the food and nutrition security situation in Hamdaniya, and increase the dietary diversity scores, the project could consider:

- Activities related to household level food storage, conservation and processing, in the form of both education and equipment inputs, to ensure food stocks are available all year round.
- Improve the availability and access to food through the provision of inputs to cover the initial investment costs of setting up household level animal production, home gardens and agricultural lands. Include foods that showed low consumption but bear high nutritional value and are suited for local production, for example; pumpkin (distribution of seeds, training on production techniques, cooking classes and seed processing demonstration).
- Improve the knowledge of existing animal owners and garden/land owners to update the knowledge held and increase efficiency and production.
- Education on the topics of hygiene, breastfeeding practices, good consumption habits and the importance of diversity in diets.

¹² Nutrition for Developing Countries 3rd ed., Oxford University Press, Edited by Felicity Savage King, Ann Burgess, Victoria J. Quinn and Akoto K. Osei, 2015.

Annex 1 Food examples

Group	Examples	Local meals
A. Foods made from grains	<ul style="list-style-type: none"> • Barley • Bulgur • Corn • Cous cous • Millet • Oats • Rice • Sorghum • Wheat • Pasta • Bread/pita • Semolina • Noodles 	<ul style="list-style-type: none"> • Dolma • Biryani • Ouzi sham • Kurdish pizza • Kibbah • Kofte/tirkshik • Schwarma
B. White roots, tubers and plantains	<ul style="list-style-type: none"> • Parsnip • Potatoes • Sweet potato (white and purple varieties) • Turnip • Artichokes 	
C. Pulses (beans, peas and lentils) (not if eaten green, fresh and in the pod, or peanut)	<ul style="list-style-type: none"> • Broad bean • Chickpea • Beans (black bean, kidney bean, white bean) • Lentil • Peas • Soybean 	<ul style="list-style-type: none"> • Lentil soup • Hommus • Soy milk • Soy products
D. Nuts and seeds	<ul style="list-style-type: none"> • Peanut/groundnut • Almond • Cashew • Chestnut • Hazelnut • Macadamia nut • Pistachio • Walnut • Flaxseed • Melon seeds • Poppy seed • Pumpkin seed • Sesame seed • Sunflower seed 	<ul style="list-style-type: none"> • Tahini • Nut butters
E. Milk and milk products	<ul style="list-style-type: none"> • Fresh whole, low-fat and skim milk • Reconstituted powdered or evaporated milk, or UHT milk • Hard cheese (cheddar, mozzarella, parmesan) 	

	<ul style="list-style-type: none"> • Soft cheese (white cheese, feta) • Kashk • Yoghurt/curd • Ayran 	
F. Organ meat	<ul style="list-style-type: none"> • Gizzards • Heart • Kidney • Liver • Brain • Testicles 	
G. Meat and poultry	<ul style="list-style-type: none"> • Beef, goat, lamb, mutton, rabbit, buffalo, etc • Tripe, intestines • Chicken, duck, goose, turkey, pigeon, other birds • Turtle 	<ul style="list-style-type: none"> • Swarma • Kebab
H. Fish and seafood	<ul style="list-style-type: none"> • Fresh, frozen or dried fish • Canned fish (tuna, anchovies, sardines) • Crustaceans – prawns, shrimp, crayfish 	
I. Eggs	<ul style="list-style-type: none"> • Chicken eggs • Ducks eggs • Goose fowl • All other bird eggs 	<ul style="list-style-type: none"> • Omelette • Fried egg
J. Dark green leafy vegetables	<p>All medium-dark green leafy vegetables and leaves</p> <ul style="list-style-type: none"> • Alfalfa greens • Arugula • Beetroot greens (leaves) • Swiss chard • Spinach • Broccoli • Carrot greens (leaves) • Chili greens (leaves) • Kale • Cowpea greens (leaves) • Cress • Lettuce (bibb or romaine) • Okra greens (leaves) • Pumpkin greens (leaves) • Sweet potato (leaves) • Turnip greens (leaves) 	
K. Vitamin A-rich vegetables, roots and tubers	<p>Roots, tubers and other red/yellow/orange vegetables</p> <ul style="list-style-type: none"> • Carrot • Pumpkin • Red pepper (sweet) 	

	<ul style="list-style-type: none"> • Squash (orange or dark yellow fleshed only) • Sweet potato (orange or dark yellow fleshed only) 	
L. Vitamin A-rich fruits	<ul style="list-style-type: none"> • Apricot (fresh and dried) • Cantaloupe/ musk melon (orange melon) • Mango (ripe, fresh, dried) • Peaches (dried or raw) • Persimmon (ripe) 	
M. Other vegetables	<ul style="list-style-type: none"> • Beans (all types when eaten fresh) • Beets • Cabbage (common red, white and green varieties) • Cauliflower • Celery • Corn (fresh) • Cucumbers • Eggplant • Green pepper • Leek • Lettuce (light green) • Mushroom • Okra • Onion • Peas (green, fresh from pod) • Radish • Tomato • Zucchini 	
N. Other fruits	<ul style="list-style-type: none"> • Apple • Avocado • Banana • Blackberry • Blackcurrant • Cherries • Cranberry • Dates (fresh and dried) • Figs • Gooseberry • Grapefruit • Grapes • Honeydew melon (green melon) • Plum • Kiwi fruit • Lemon • Lime • Mandarin 	

	<ul style="list-style-type: none"> • Nectarine • Mulberry • Orange • Peach • Pear • Pineapple • Pomegranate • Pomelo • Prune • Quince • Raspberry • Strawberry • Watermelon 	
Q. Other oils and fats	<ul style="list-style-type: none"> • Butter • Cream • Ghee (animal and vegetable) • Lard (animal fats) • Margarine • Mayonnaise • Sour cream • Vegetable/fruit/nut/seed oils (e.g. oils made from canola, cottonseed, groundnut/peanut, olive, rapeseed, corn) • Any other oils extracted from a nut, seed or grain 	
R. Savoury and fried snacks	<ul style="list-style-type: none"> • Corn chips • Crisps • Potato chips • Donuts • Samosas • Other deep-fried snack foods • Potato fries 	
S. Sweets	<ul style="list-style-type: none"> • Biscuits (sweet) • Cakes • Candies • Chocolates • Sweetened coconut snacks • Cookies • Frozen custard/yoghurt • Fruit canned in sugar syrup • Fruit “gummy” candies, fruit “leathers” • Ice cream • Halwa • Honey 	

	<ul style="list-style-type: none"> • Jam • Marmalade • Pastries (sweet – fried or baked) • Pie • Sesame seed candies • Sweetened condensed milk • Baklava • Any other sweets 	
T. Sugar-sweetened beverages	<ul style="list-style-type: none"> • Chocolate drinks (including pre-packaged fluid drinks and powdered) • Coffee with sugar • Energy drinks • Fruit drinks, sweetened fruit juices • Malt drinks • Soft drinks/sodas/carbonated or fizzy drinks • Tea with sugar • Any other drinks sweetened with sugar, corn syrup, honey or other sweetener 	
U. Condiments and seasonings	<ul style="list-style-type: none"> • Bouillon cubes, flavour cubes, stock cubes • Chili peppers (hot) • Chives • Dried soup packets • Fish powder • Fish sauce • Garlic • Ginger • Horseradish • Herbs (dried, fresh and all types) • Ketchup • Lemon or lime juice used to bring out the flavour of mixed dishes • MSG • Mustard • Seed or seed pastes when used to flavour or garnish a dish (e.g. Tahini if used to flavour dish) • Soy sauce 	

	<ul style="list-style-type: none"> • Spices (dried, fresh, all types) • Sugar when added to flavour a mixed dish • Tomato paste • Any other seasoning or flavouring added during cooking • Any garnish added at the end of cooking or when serving (e.g. grated cheese, grated vegetable, seeds or legumes) 	
V. Other beverages and foods	<ul style="list-style-type: none"> • Alcohol, all types • Pickle cucumbers and vegetables • Clear broth or soup broth • Coffee, with or without milk, unsweetened • Herbal beverages/infusions • Olives • Tea, with or without milk, if unsweetened • Any other food or beverage not included in previous groups/categories 	

Annex 2 Differences in food consumption for those above or below the threshold of five food groups (10 food groups)

Food group	Nimrud		Bartella		Hamdaniya		Bashiqa	
	≤5 groups	≥ 5 groups	≤5 groups	≥ 5 groups	≤5 groups	≥ 5 groups	≤5 groups	≥ 5 groups
Grains, white roots and tubers	23	18	23	27	20	32	17	30
Pulses	14	8	5	8	3	8	3	18
Nuts and seeds	3	8	7	14	4	16	3	16
Dairy	20	18	8	23	13	27	13	25
Meat, poultry and fish	4	14	6	22	8	28	6	21
Eggs	2	7	10	12	2	22	5	13
Dark green leafy vegetables	2	3	2	4	0	9	1	9
Other Vit-A rich fruit and vegetables	1	2	0	2	1	2	0	0
Other vegetables	14	16	16	27	14	32	14	26
Other fruits	3	11	3	18	2	20	3	23

Annex 3 Differences in food consumption for those above or below the threshold of five food groups (additional food groups)

Food group	Nimrud		Bartella		Hamdaniya		Bashiqa	
	≤5 groups	≥ 5 groups	≤5 groups	≥ 5 groups	≤5 groups	≥ 5 groups	≤5 groups	≥ 5 groups
Oils and fats	7	6	20	25	13	30	16	30
Savoury and fried snacks	1	5	3	11	6	11	6	13
Sweets	2	5	2	5	3	12	3	11
Sugar sweetened beverages	24	18	19	24	14	27	16	26
Condiments and seasonings	3	6	22	27	19	32	17	30
Other beverages and food	1	7	5	9	8	16	6	16

Annex 4 Households processing foods for home consumption during seasonal gaps

Sub-district and MDDS-W	No	Yes
Bartella	44	7
1	1	0
2	1	0
3	10	1
4	9	2
5	13	0
6	5	2
7	5	1
8	0	1
Bashiqa	27	20
3	2	1
4	8	6
5	4	5
6	8	5
7	4	2
8	1	1
Hamdaniya	39	13
2	3	0
3	7	0
4	7	3
5	8	2
6	5	4
7	8	4
8	1	0
Nimrud	40	6
2	3	0
3	16	0
4	8	0
5	8	4
6	4	1
7	1	0
8	0	1
Total	150	46

Annex 5 Households storing foods for home consumption during seasonal gaps

Sub-district and MDDS-W	No	Yes
Bartella	36	15
1	1	0
2	1	0
3	10	1
4	8	3
5	9	4
6	4	3
7	3	3
8	0	1
Bashiqa	30	17
3	2	1
4	9	5
5	5	4
6	10	3
7	3	3
8	1	1
Hamdaniya	22	30
2	2	1
3	5	2
4	3	7
5	3	7
6	4	5
7	4	8
8	1	0
Nimrud	26	20
2	2	1
3	14	2
4	3	5
5	6	6
6	0	5
7	1	0
8	0	1
Total	114	82