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Factors affecting meat consumption in Sulaymaniyah city of Iraqi Kurdistan

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Declaration

I hereby declare that I have done this thesis entitled Factors affecting meat consumption in Sulaymaniyah city of Iraqi Kurdistan independently, all texts in this thesis are original, and all the sources have been quoted and acknowledged by means of complete references and according to Citation rules of the FTA.

In Prague

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Acknowledgements

Abstract

Global average meat consumption increased considerably during the last fifty years; the biggest share of the increase is coming from emerging countries. Iraqi Kurdistan is one of the low-income regions, the area faced an economic crisis from 2014 to 2018 that made a change in the level of food consumption

The main aims of the study were to determine the effect of demographic characteristics, household characteristics, especially income, and consumer behaviours on meat consumption in one of the cities in the region, as well as the change in the patterns of meat consumption during the crisis.

A quantitative exploratory questionnaire survey was used to collect 233 filled questionnaires in Sulaymaniyah city using quota sampling. Data analysis programme SPSS was used for statistical data analysis. Multiple linear regression model and Chi-squared test were used to analyse the data. The result from the analysis shows that among the most important factors that statistically significant relation to meat consumption are income, gender, preferences for the taste and importance of fat content in the meat for the consumer. While characteristics such as age, education, household size and concerns about animal welfare did not have an effect on meat consumption in the area in our model.

The study can fill a gap in the field of consumer behaviours and be used as a source for future research. Also, the meat producers and sellers can take advantage of the finding from the study to understand consumer preferences and satisfaction and use more appropriate marketing strategies.

Key words: Consumer behaviour, economic crisis, meat production, household income, red and white meat

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List of the abbreviations used in the thesis

Ch^2	Chi-squared test
EU	European Union
GDP	Gross domestic product
IQD	Iraqi Dinar
KRG	Kurdistan Regional Government
KRSO	Kurdistan Region Statistics Office
LRM	Linear Regression Model
Max	Maximum
Min	Minimum
OECD	Organisation for Economic Co-operation and Development
PV	Probability Value
R^2	Coefficient of determination
SPSS	Statistical Package for the Social Sciences
St. E	Standard Error
UK	United Kingdom of Great Britain and Northern Ireland
US	United States of America
USAID	United States Agency for International Development
USD	United States Dollar

1.   Introduction and Literature Review

1.1.   Introduction

Consumers represent the last step of the production chain, they are rational beings, influenced by many internal and external factors that change their emotions, decisions, awareness and even actions. Consumer expectation is the driver of their satisfaction and shopping behaviours. Psychological and physical impacts on human behaviour and especially on the selection of products and pursuing decision is a great field of study that has been investigated widely. Our life is driven by some factors such as feeling, motivation, knowledge and expectation, therefore, exploring their impacts on human behaviours is very crucial to understand the nature of the consumers and promote the marketing of determined products. Consumer attitudes and beliefs about determined product depend on the product itself and on the characteristics of the individuals which are measurable, variable and affect personal emotions and behaviours (Font-i-Furnols & Guerrero 2014).

This study focuses on consumer behaviour in one of the Iraqi-Kurdistan cities. The area faced an economic crisis which led to a reduction in income level and as a consequence, lowering consumer purchasing power. During the crisis, the price of goods and food declined, but could not keep the pace with decreasing incomes. However, meat price staid constant and we want to know how the consumers changed their level and pattern of meat consumption. Furthermore, to determine what are the most important factors that influence their meat consumption.

Meat has an essential role from the cultural, social, and economical point of view, its level of consumption explains the welfare propensity of consumer (Grunert 2006). Additionally, the livestock sector has a contribution to Gross Domestic Product (GDP) of the country over domestic consumption and international trade, and it has a connection to many other sectors such as supply chain, refrigerated transport, wholesaler, retailor, food and beverage (Rosegrant & Ehui 1999). The average global per capita meat consumption is rising, but the increase is mostly in emerging countries which are characterised by fast urbanization and income growth. While in the advanced countries, consumption is

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stagnated due to awareness and concerns about the environment and animal welfare. Understanding the main drivers and trends in the emerging countries and their relation to meat consumption can support the better market of meat and consumer satisfaction. Therefore, consumer behaviours should be taken in to account by each of the producers and distributors (Prokeinova & Hanova 2016).

1.2. Literature Review

1.2.1. Nutrition transition theory

The nutrition transition theory by Kearney (2010) and Popkin (2006) states that over time, consumers go through a set of nutrition transitions. The transition described in five stages: the first stage starts with primitive society, where the food obtained by hunting and gathering, its food characterized by high carbohydrates and fibre but less fat. The second stage is known as the famine era, the populations increase, and diet is less varying and food production is small, the society becomes agricultural. In the third stage, the famine ends because the society tends to be industrial, new technologies appear, but the diet still is not varying, containing less starchy food, more vegetable and fruit and animal protein. During the fourth stage, people are less active due to the development of the service sector and this leads to appearing of degenerative diseases. The diet contains more fat, cholesterol and sugar while low level of fibre and polyunsaturated fatty acids. In the fifth and last stage, society goes for more healthy food because of the awareness rising. People have more physical activities in leisure time, obesity decline but bone health problems rise (Kearney 2010; Popkin 2006).

1.2.2. Theory of consumer behaviour

Consumer behaviour is the study of how individual or organizations select, buy, use and dispose goods or services. It is a decision process and physical activity, which individuals engage in during evaluating, acquiring, using or disposing of goods and services. Consumer behaviour is varying from one consumer to another, region to region, and country to country. It is influenced by many factors, such as marketing (product design, price, promotion, packing, positioning and distributing), physiological factors (perception, attitude and motivation), social factors (family and reference group), cultural factors (religion and class) (Yesserie 2015).

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Consumer attempts to allocate his/her limited money income among available goods and services so as to maximize his/her utility. The theory of consumer behaviour is built on both of the cardinal and ordinal approach. The cardinal utility analysis believes that the utility can be measured quantitatively which attracted criticisms and led to the development of the ordinal utility analysis. The ordinals maintained that utility is not measurable. Pareto, an Italian Economist, severely criticized the concept of cardinal utility. He stated that utility is neither quantifiable nor addible. He suggested that the concept of utility should be replaced by the scale of preference (Bruni 2005).

1.2.3.   Meat and its types

Meat muscle made of fibres tied together with connective tissue and connected to other sets of tissues or straight to the bone structure. It is entirely digestible, includes 60-70% of moisture, 10-29% protein, 2-22% fat, and 1% of ash, relying on type and species. There is a considerable amount of cholesterol in meat, which is a waxy substance existing in all the body cells of human and animal. The colour of distinct types of meat changes according to; muscle usage, type of proteins, oxygen, and age. Generally, there are red and white meat, precisely each species has a different colour; beef is bright cherry red, fish is pure white to grey-white or pink to dark red, lamb and mutton is light red to brick red, pork is greyish pink, poultry is grey-white to dull red, veal is brownish pink (Meat Science and Nutrition 2012).

1.2.4.   The effect of meat consumption on health

Meat has two types of cholesterol; one is known as good cholesterol which has a high-density lipoprotein (HDL), and another known to be harmful which has low-density lipoprotein (LDL). Cholesterol is necessary for the function and structure of the body cells, but excessive intake affects the health negatively. That is the reason why meat is known to be unhealthy (Meat Science and Nutrition 2012). Despite all the negative attitudes and opinions about meat, it is the central constituent of our diet and is the main source of animal-based protein which is necessary for human body functions (Font-i-Furnols & Guerrero 2014).

Animal products contain a large amount of protein compared to other non-animal products (Yaylak et al. 2010). A balanced and high-quality protein diet is important to preserve the body health, mainly in aged consumers. Nutritionists recommend taking about 50% of the daily protein intake from animal sources to have a healthy and balanced diet (Karli et al. 2017). Higher animal protein intake can support better physical functioning and minify age-related problems such as muscle strength and frailty. Furthermore, meat contains vitamin B which also improves physical functions (Struijk et al. 2018). At the same time, a lot of studies found a link between red meat and colorectal cancer. Meat increases heart diseases as it is a source of saturated fatty acids and cholesterol (Schmid et al. 2017). According to the latest meta-analysis studies in the US, red and processed meat has a link with cardiovascular and cancer mortality. Also, the consumption of processed meat will increase the risk of impaired agility and lower extremity function. The negative impacts on health are less in fresh meat than processed meat, processed meat increases the risk of cardiovascular problems by rising the blood pressure and endothelial disfunction (Sacks et al. 2017).

1.2.5. Worldwide meat consumption

From ancient time, meat has been one of the main food sources for human livelihood, people were hunting animals to stay alive. The first domesticated animals to consume as foods were sheep and goats, and as society transformed into a more sedentary lifestyle, the domestication of pigs and cattle as well appeared (Statista 2018).

After the subsistence economic stage, the food consumption patterns directed toward increasing in the consumption of plant origin-based food which characterised by high agricultural output and low cost, but with the improvement in per capita income, the dietary transition identified by radical change in food consumption toward using of more calories-containing and expensive foods, mainly animal products (Sans & Combris 2015). In 1961, the average global per capita meat consumption was around 23 kg annually, but this amount increased to 43 kg in 2014 and led to increasing in meat production which has been growing faster than population growth. The change rate is much higher in the countries that went through a large economic transition. In China, per capita meat consumption has increased 15 times since 1961, and in Brazil increased 4 times (Ritchie & Roser 2018). In 2015, the most widely consumed meat was pork, which was 15.3 kg

per capita consumption globally, followed by poultry 13.8 kg per capita and lastly beef which was counted to be 10.1 kg per capita (Statista 2015).

Additionally, it is forecasted that per capita beef and poultry consumption will exceed pork consumption by 2030 (Statista 2015). However, another forecasting by OECD for 2027 reports that poultry and sheep consumption will increase while beef and pork consumption decreases or remains constant (OECD 2017).

All the projections confirm that meat consumption will continue to grow in future, some studies forecasted that the income growth will lead to an increase in meat consumption by 100% in 2050. Although, expansion in the demand for livestock products will increase by 62 - 144% (Godfray et al. 2018). Meanwhile, a review by Alexandratos and Bruinsma (2012) prepared for FAO of the United Nations predicts that by 2050, meat consumption will increase by 76%, this includes a doubling in the consumption of poultry, 69% increase in beef and 42% increase in pork. Figure (1) shows the average global per capita meat consumption in 1990 and 2014, as it is visible from the Figure, world meat consumption increased considerably. The rising in consumption is varying across the regions, in each of Brazil, China, Israel, and South Africa, the increasing is very high, while in India, EU, OECD and the US it was slightly increasing, and in Canada, New Zealand and Switzerland the consumption has declined.
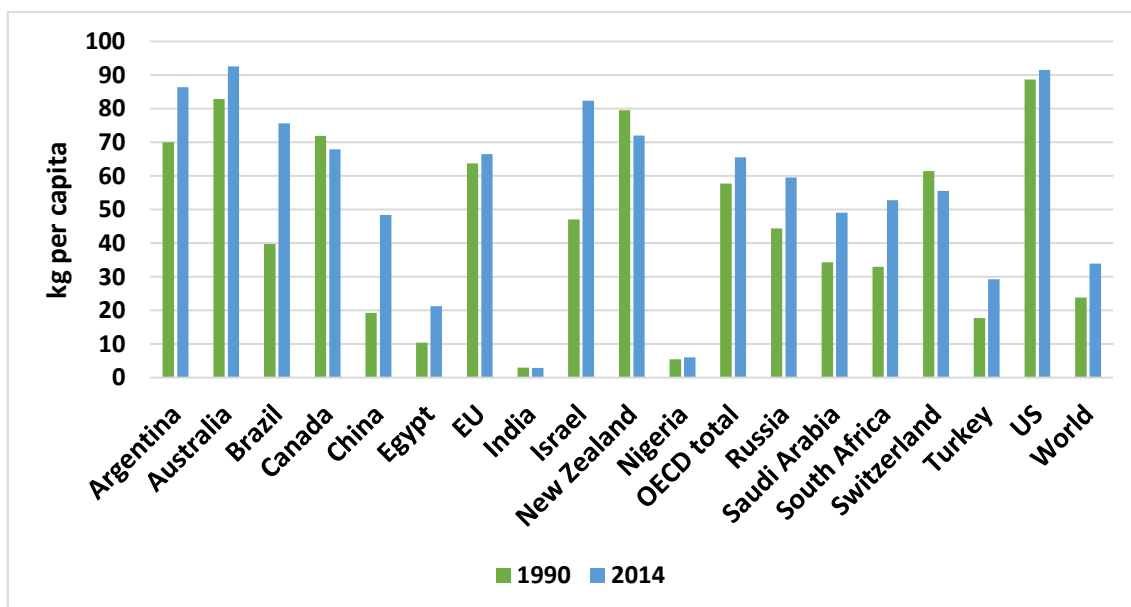
Figure 1. Worldwide meat consumption difference between 1990 and 2014

Source: (OECD 2017)

1.2.6. Worldwide meat production and environmental effects

One of the problems of the global economy is growing food demand due to population growth and rising in the living standards. There is a need for about 90 trillion more kcal of energy globally that was determined based on annual population growth. Meanwhile, about 8% of total energy intake by a human is coming from meat, this indicates that livestock production needs to be increased and its influence on the environment will also increase (Hovhannisyan & Grigoryan 2016).

From 1961, meat production in Asia grew up by 15 folds while in Europe and North America it was doubled and 2.5 folds respectively. During the last 50 years, due to an increase in demand, total meat production expanded 4-5 times which is described as livestock revolution (Ritchie & Roser 2018). Meat demand and supply are influenced by some factors such as price fluctuations, a number of animals in the country, production and processing technology, storage, national income, consumer preferences, habits and per capita net income (Akbay 2019).

Comparing to crop production, livestock production is inefficient because it needs a massive amount of energy during production which is 75 times more than the energy used in corn production, another reason why livestock production is inefficient is that very wide range of land (7 times bigger than the Europe Continent) needs to produce food for the animals globally, and about 50% of the world harvest uses as animal feed. Furthermore, to produce one calorie of protein from beef, 54 calorie of fuel needs to be used, while to produce one calorie of protein from wheat or corn, it takes about 2-3 calories of fossil fuel (Gold 2004). Meat production has many negative environmental impacts, such as; pollution as the consequence of fossil fuel usage, natural pasture destruction, land and water utilization, pre-farm production activities (machinery and pesticides), on-farm activities such as soil emissions, manure emissions and emission from energy consumption, and post-farm actions which is including slaughtering, processing, packaging, storage and cooling and allocation (Petrovic et al. 2015). Additionally, livestock production has an impact on human health risks, this is through the contamination of water and land by animal residuals and transferring of many diseases over direct contact and their meat as well (Herrenda & Franco 1991).

The awareness of environmental effects as a result of livestock production is more visible among inhabitants in the advanced countries rather than less developed countries,

this helped to reduce meat consumption in those areas, while in the emerging countries, the demand for meat seems to continue increasing and this will deepen the negative impacts on nature and environment by livestock production (Prokeinova & Hanova 2016). Figure 2 shows the worldwide meat production in million tons in three different times.
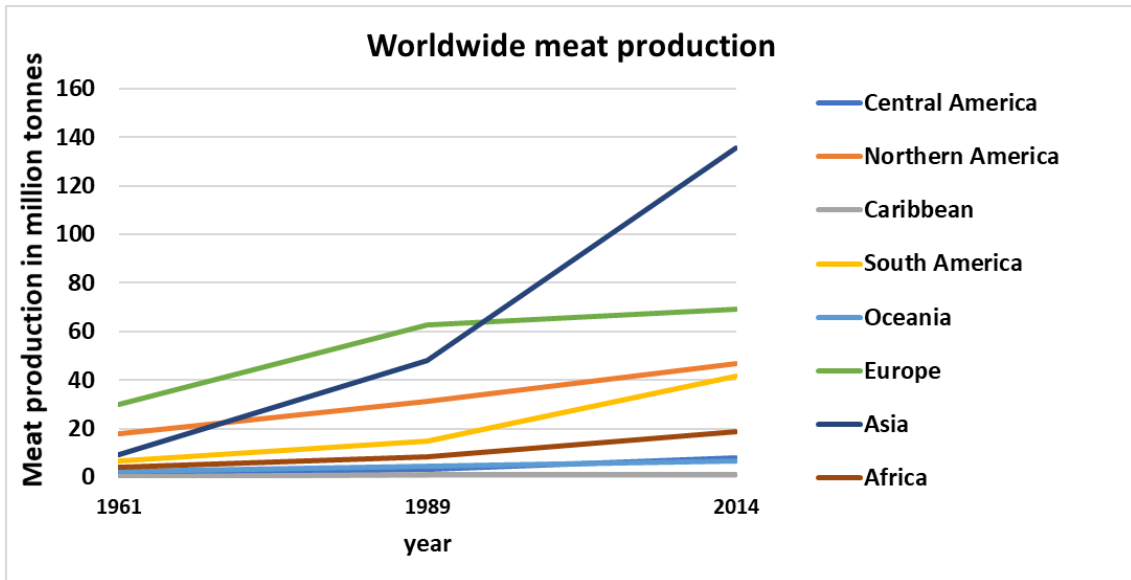
Figure 2. Worldwide meat production

Source**: (**Ritchie & Roser 2017)

1.2.7.   Meat consumption in high-income and low-income countries

There are two different images for meat consumption in less developed and more developed countries, in developed countries, excessive meat consumption has negative insight and less meat intake means a healthier lifestyle. While in less developed countries, more meat consumption is an indicator of higher-quality lifestyle (Mathijs 2015). In the regions that characterised by fast civilization and income growth, per capita meat consumption is increasing faster than the other regions, this is because the inhabitants go for more consumption of foods and especially high animal protein contents. Per capita meat consumption stagnated in advanced countries because they reached the level of saturation in meat consumption. From 1970 until 1990, the consumption of meat in emerging countries increased three times faster than in high-income countries (Rae 1998; Delgado et al. 1999). Furthermore, the caloric participation from animal products to total calorie intake in emerging countries in 1990 was only a quarter of caloric intake in

advanced countries (Cranfield et al. 1998). In high-income regions, the animal-based foods are the main source of animal protein which accounts for 70% of their total protein intake, and the rest are from non-animal origin sources, but in a country like Turkey, only 27% of the protein intake comes from animal-based sources and the rest is from herbal products (TAGEM in Karli et al. 2017).

1.2.8. Strategies and policies to reduce meat consumption

According to studies and data from FAO, global meat consumption and livestock production have extremely increased, and this has a negative impact on human health and the environment as well. Hence, there is a need for reducing the quantity of meat consumed in the average diet. However, this may need a profound societal transition because meat has a prominent position and holds a special status in many societies, it is a staple food in many countries and perceived as healthy food. Therefore, wholesale changes in consumer diets may not be easily achieved in short term, this is due to the reluctances such as tradition, cultural values, and hedonistic lifestyles (De Bakker & Dagevos 2012).

The successful strategies and policies to reduce meat consumption need a good insight of factors that discourage or foster consumers toward changing the diet to less meat content, also, how the information regarding those factors reach the consumer in the market. Furthermore, for better results, the strategy should work at the level of consumer groups, not the average consumer. One of the ways to reduce the amount of meat in the diet is meat substitutions, such as soybean, algae, plant protein and mycoprotein as mincemeat which has the similar texture as meat but in shape of burgers and stir fry cubes (Apostolidis & McLeay 2016).

Meat substitutes production is more efficient and safer than conventional meat production, it needs less energy, water, and land use, and has less environmental effects and carbon footprint. Additionally, they are healthier than meat as they contain less fat. Those merits can receive consumer through labelling. There are three types of consumers and meat substitutes labelling should hold information for each of them, one is healthy consumers, in which the label highlights information regarding health and nutritional benefits of meat substitutes, the second group is green consumers, here the label highlights environmental and carbon footprint benefits, the last group is organic

consumers in which the label shows the method of production and animal welfare benefits. Furthermore, labelling on meat and meat products include information related to production consequences such as environmental impact, carbon footprint, type and origin of the meat and meat replaces may also affect consumer behaviour and contribute to reducing of the meat consumption (Bryant & Barnett 2018).

Another strategy to reduce meat consumption can be through subsidising the production of the meat substitutes to decrease the relative price of meat substitutes. Furthermore, financial motives such as taxation can work as a way to reduce meat consumption by increasing meat price, but at the same time, this may face protests from meat producers, politicians, and consumers, because the high price of meat is not in the favour of each of producers and low-level income families as well. Moreover, awareness rising through developing campaigns to encourage consumers to reduce meat (Delgado et al. 1999).

One more approach is cultured meat, which is a synthetized meat, made in vitro by some tissue engineering techniques, it is a cell taken from the animal body instead of slaughtering the alive animal, the cell is grown in a culture medium to produce the cultured meat. Comparing to conventional meat, cultured meat is healthier and more efficient since it needs 7-45% lower energy (except for poultry), 78-96% less greenhouse gas emerging, 99% lesser land use and 82-96% lesser water usage. Despite the uncertainty, it has been said that total environmental effects from cultured meat production are basically lower than typical meat production (Mattick et al. 2015).

1.2.9. Factors affecting meat consumption

Meat consumption is differing across nations, households and individuals, there are a lot of factors influence consumption. According to the result of an European research projects in 2017, a wide set of factors highlighted to have impact on food choice (including meat), which are: biological determinants (hunger, satiety, palatability of food, taste, and sensory aspects), economic determinants (cost, income and availability of foods), physical determinants (ease of access to food, education, specific skills, and time constraints), social determinants (culture, family, peer-group pressures, and meal patterns), psychological determinants (mood, stress, and guilt), attitudes, beliefs and knowledge about the food (Mathijs 2015). According to a research conducted in

Switzerland in 2017, the most important factors to influence meat consumption were awareness, knowledge on the importance of healthy diet, education level, gender, household size, preferences, religion, animal welfare, environment, urbanization and income level (Schmid et al. 2017).

1.2.9.1. Demographic characteristics

Characteristics such as age, gender and education can have a role in changing the amount of consumed meat. Many studies tried to discover if meat consumption is significantly different between the two genders. A considerable number of studies concluded that meat consumption is higher among males than females, it may link to more sensitivity of female to bloodiness and animal welfare as well as more concerns about weight and health (Clonan et al. 2015). Meanwhile, Curtis and Comer (2006) refuse existing any relation between meat consumption and gender. Age is another character that may influence meat consumption. Meat contains a considerable amount of cholesterol, this is beside that the risk of diseases related to blood cholesterol increases with age, as a consequence, the consumption may decline among the elder consumers (Clonan et al. 2015).

Furthermore, meat consumption may affect by education level as well. Excessive meat intake is known to have negative effects on body health comparing to non-animal-based foods, this is having more concerns among educated consumers. Additionally, educated consumers have more awareness about livestock production effects on the environment. Therefore, education may have a role in reducing the meat consumption (Dibb & Fitzpatrick 2014).

1.2.9.2. Household characteristics

Income and price are the key factors that affect food consumption (Karli et al. 2017). This creates a greater gap between high- and low-income families. Many researches supported that the price of meat has a big influence on purchasing decision by the consumer. This can play a major role for producers as well; they can predict the demand based on the income level of the households (Gallet 2010). Income impacts on normal goods are always positive because consumption increases as income increases and decreases as income decreases, this is shown by the Engel curve. The income effect is

negative for inferior goods because consumption decreases as income increases and vice versa and so the Engel curve slopes downward (Selim 2001).

A study by Gallet (2010), proves that lower income households reduce their beef consumption rather than poultry and pork, this is beside that beef price is higher than other types of meat and this shows the importance of income for meat consumption. Furthermore, the study found that income elasticity in Asia is much higher than in Australia because income is Asian countries is lower (Gallet 2010). Meanwhile, some studies reported that there is a segment of consumers that prefer a higher price of meat because they are looking for better quality. This is widely visible among high income consumers. Additionally, concerns about reliability are higher among high income countries (Karli et al. 2017). According to Mathijs (2015), meat consumption is decreased or stagnated in high income countries. This is due to factors such as; consumers tend to have a healthier lifestyle, obesity, more concerns about the environment and animal welfare.

Result by Vranken et al. (2014) reported a U-shaped relation between income and meat consumption. This indicates that meat is a luxury food and increase with the rising of income, but at the same time, it has a limit and will reach the saturation level and decrease.

In higher income countries such as the UK, consumption remained high and the patterns of consumed meat have been changed (Apostolidis & McLeay 2016).

1.2.9.3. Consumer attitudes

A study by Benda Prokeinova and Hanova (2016), argue that in the recent period, non-economic factors such as attitudes and beliefs are becoming more important for consumers in making a decision. Attitudes and beliefs toward determined products by the consumer can influence their perception (Claret et al. 2014). Individual attitudes are linked to beliefs which is the knowledge consumer obtained about the product. Beliefs formulate by direct observation, experience and information from different sources in a long-time process (Fishbein & Azjen 1975). According to research in Turkey, habits were the main reasons that 47% of the meat consumers eat meat (Karli et al. 2017).

One of the attitudes is taste preferences that have an impact on consumption. According to literature, the consumption of a specific type of meat increases with

increasing of the preferences for that type. However, it is affected by the financial situation. In some cases, the consumer prefers a specific type of meat but cannot afford it and go for the less preferable type because it is cheap. According to a study in Switzerland, pork meat was the least preferred type and specified to be fattier and less digestible than other types of meat, but its consumption is still high due to affordability by consumers (Schmid et al. 2017).

In Turkey, the news regarding the health consequences of meat consumption decreased consumption by almost 45.7% and shifted consumer preferences (Karli et al. 2017). According to Schmid (2017), cholesterol content was between the most important factors to eat less meat. In a study to determine the healthiest type of meat, the types with more fat such as pork chosen as less healthy, while beef has the second position and poultry reported as healthiest meat. However, in some countries such as Japan and South Korea, fatty pork was preferred as lean pork (Ngapo et al. 2007).

In the last decades, meat is produced to have less fat, but some studies found that this reduced from the quality of the meat in term of taste in the consumer's point of view (Font-i-Furnols & Guerrero 2014).

Regardless of tradition and preference for meat, meat consumption has a negative side as well, this is related to the concerns about animal welfare, production consequences, health, religious issues, ideology, ethical and moral (Guerrero et al. 2012).

During the past few decades, animal welfare became an important argument for in relation to consumption for researchers and consumers as well. The concerns about animal welfare are increasingly becoming important especially among European consumers (Latvala et al. 2012).

For the majority of consumers, animal welfare is important, while despite this concern, they forget about it during meat purchasing. This may be due to a psycho-protective mechanism which is called "directed or intentional forgetting" which is happening at the purchasing moment (Font-i-Furnols & Guerrero 2014).

Bryant and Barnett (2018) suggested using of the cultured meat which is artificial meat made from an animal cell in the laboratory to reduce the consumption of conventional meat. The study reveals that cultured meat is in favour of animal welfare and the environment. Additionally, some researches have been done in the recent years

such as (Siegrist & Sütterlin 2017; Wilks & Phillips 2017) to determine the consumer acceptance for cultured meat and the results show positive interest to cultured meat. Hence, the cultured meat can play a role to reduce meat consumption.

1.2.10. Kurdistan region of Iraq

1.2.10.1. General information about the Territory of Kurdistan

Iraqi Kurdistan is an autonomous region located in the northern part of Iraq in an area about 46,861 km² (accounts for more than 18% of Iraq's total area). The region is mostly mountainous with an average of 2,500 m and an altitude of 300 m. There is plenty of water coming from five big rivers, 3,662 springs, groundwater, rainfall and 68 dams. The average rainfall is (700 mm) per year. The area characterized by fertile soil and arable land which accounts for 28% of the total area. The region is Running by Kurdistan Regional Government (KRG), have four major governorates (Arbil, Sulaymaniyah, Halabja, and Duhok), 136 districts and 5,600 villages. Arbil is the capital city. The official languages are Kurdish and Arabic. The population is 6,033,814, of which, 50% is male and 50% is female, the urban population contains about 81% of the total population and 19% is rural. Population density is 129 people/km^2. The population growth rate was 3% in 1990 and it decreased to 2.3% in 2019 (Baban 2015; KRSO 2019).

1.2.10.2. Economic performance

Before 1930, prior to the developing of the oil sector, Iraq's economy was mainly depending on agriculture, but today, the main source of economy is the oil export, with 15% participation of both of tourism and agriculture. In the past, agriculture in Kurdistan had great participation to Iraq's economy, but after the starting of Iraq-Iran war (1980-1988), the region faced a lot of difficulties that led to a remarkable decrease in agriculture and livestock production (Brie 2006).

At the beginning of 2014, before the economic crisis, the Ministry of Commerce and Industry in the Kurdistan region forecasted that the annual average per capita income will rise to 10 thousand USD per year by 2018, while it was 7 thousand USD per year in 2014, but due to the economic crisis, annual per capita income declined to $4,800 in 2016 (Almada Press 2014).

The Kurdistan region of Iraq has seen remarkable economic growth during the decade after the collapsing of the former regime in Baghdad in 2003. The economic situation revived, and the standard of living raised through the creation of thousands of job opportunities, activating the private sector, and attracting foreign capital. But this economic growth faded gradually with the growing political differences between Baghdad and Erbil in mid-2013; which led to cut the Iraqi federal authorities share of Kurdistan entirely by the Central Government in Baghdad since the beginning of 2014 (Kaku 2018).

The economic development between 2007 and 2014 was around 7 to 10%, but after 2014, when the government suspended all the investment projects, the economic growth declined to 5%. The average per capita income in the region was up to 400 USD per month in 2016 (Abbas 2017; KRSO 2017; Kaku 2018). According to the Hasan (2018), the director general of Administration and Finance, Ministry of Planning KRD, Kurdistan's GDP per capita was $4,452 in 2017. Total nominal GDP in Kurdistan in 2012 was $23.6 billion (Invest In Group 2013) and $26.5 billion in 2016 (IFP Iraq 2016). However, due to not availability of the precise data, KRSO estimates the GDP of Kurdistan region based on the proportion of Iraq's overall GDP. According to that, the Kurdistan GDP is between 14% and 20% of Iraq's overall GDP. Figure 3 illustrates the GDP of Iraq in billion USD including Kurdistan GDP (World Bank Group 2015).
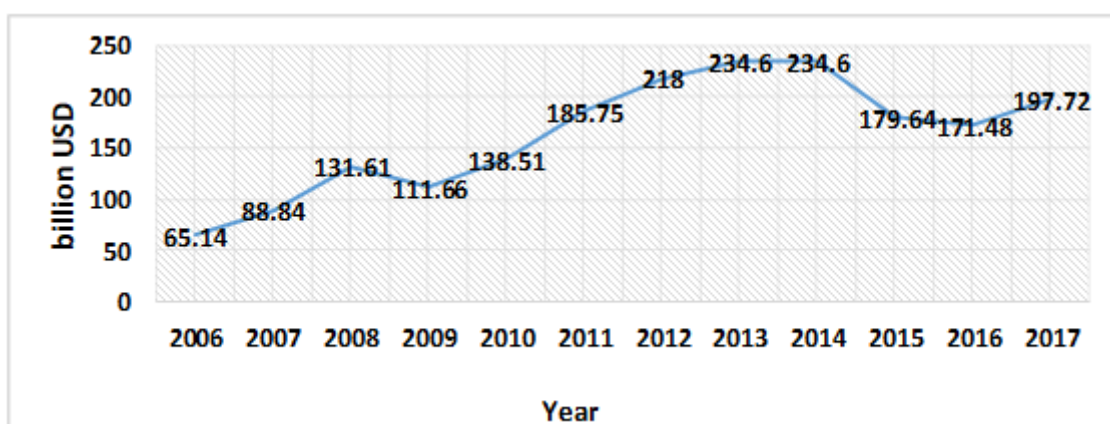
Figure 3. Iraq GDP in USD

Source: (Trading Economics 2018)

1.2.10.3. Agriculture sector

It has been said about the region "Kurdistan is truly the Garden of Paradise, there is nothing that cannot grow in its soil" (Laurent 2012). The region has historical importance in agriculture, the ancestors of today's Kurdish people set up the first village-based agriculture dating back to 11,000 years ago which is called Charmu or Jarmo, it is located in Sulaymaniyah city in Kurdistan and known to be the oldest village that started agriculture. Furthermore, the first domestication of goats and sheep was in Mesopotamia where Kurdistan is part of it. Kurdistan called the breadbasket of Iraq, agriculture in the region can participate in economic development and growth because it is characterized by fertile soil, abundant water source and suitable climate (USAID 2008). According to the Regional Development Strategy for Kurdistan, agriculture was providing a source of livelihood for 35% of the population in 2003, this proportion declined to 23% in 2007, and to 10% by 2012. Moreover, only 7.1% of workers are employed in the agricultural sector and value added by agriculture was 3.1% in 2013. Government is spending only 4% of it is budget on agriculture, while according to the international standards it should be around 10%. Kurdistan Region Statistics Office (2017) shows that in 2017, agriculture participated by 10% of total GDP (KRSO 2017; World Bank 2013).

1.2.10.4. Food self-sufficiency

In 2016, the region was importing 90% of its food from other neighbouring countries, while in 2007, about 65% of its food was imported and 35% produced domestically. The region can easily reach self- sufficiency and ensure food security if the government provides a better budget for the agriculture sector because currently, the ministry cannot support farmers with credible seed, disease protection and marketing (Murad 2016; USAID 2008). At the same time, the region exports some of domestic products to another countries, for instance, in 2017, 600 tons of potatoes exported to Saudi Arabia , 6,000 tons of pistachios to Iran, 8 tons of honey bee to United Arab emirates, 10 tons of rice to Sudan and about 6,000 tons of poultry to Syria in 2016 (KRSO 2017).

Hunger map from WFP (2018) shows that Iraq (including Kurdistan region) is between the countries with a high level of hunger which means, that between 25 to 34.9% of the population is undernourished (WFP 2018).

1.2.10.5.   Livestock sector

Kurdistan has high-grade pasture land for animal farming, according to KRSO (2014), the pasture area (both of natural and made) was about 1,223,000 ha. Animals living in the region are mainly: Farm animals (goat, sheep and cattle, rabbit), poultry (turkeys, chickens, pigeons, geese), fish and the honey bee.

A result from the World Bank report (2015) shows that shortage in the allocation of government-subsidized agricultural inputs due to economic crises has affected farmers. This led to poor harvest which will threat livestock productivity and health because of poor access to animal feed sources and lack of enough services and veterinary supplies. As production losses increase, it will become difficult for farmers to continue or start again (World Bank Group n.d. 2015).

Here in Table (1) is the value of some indicators of livestock production in Kurdistan region published by Kurdistan Regional Statistical Office.

Table 1. Livestock and domestic animal production

Indicators	Year	Value
Number of meat poultry farms	2017	1,389
Number of projects for hatching	2017	42
Number of poultry slaughterhouse	2017	7
Number of projects for goats and sheep farming	2017	70
Number of projects for breeding dairy cow	2017	64
Number of cows	2017	256,999
Number of sheep	2017	2,399,176
Number of goats	2017	1,223,949
Number of forage projects	2017	25
Number of projects for fattening young calf and goat	2017	49
Product of white meat (chicken meat/tons)	2017	108,000
Production of red meat (tons)	2017	78,000
Edible eggs	2017	575,675,000
Forage product (tons)	2017	856,275
Project Fish	2016	383

Source: (KRSO 2019)

The farms in the area are mainly owned by private households to provide income and animal products for their needs. However, a small number of households in the region have livestock which contains mainly of poultry and sheep. The result of researches shows that agricultural activities are low, and household-level agriculture has no significant participation to the food supplying (WFP 2017). From Table (2), it is evident that the average of households who own livestock farm is 13.5% of the total population and the number of animal farms per household is low.

Table 2. Percentage of households owning livestock and the average numbers of livestock per household in 2016

Governorates	Percentage of households from total population owning livestock	Animals per household (average)
Arbil	10.9%	17
Sulaymaniyah	12.0%	6
Duhok	17.8%	3

Source: (WFP 2017)

1.2.10.6.   Meat consumption in Kurdistan region

The Ministry of Agriculture determined the standards of per capita meat consumption as; 14.4 kg for red meat, 23.9 kg of white meat. However, according to the data from slaughter houses, consumers eat meat more than this standard, because a lot of meat imports through the borders illegally which is not counted by the ministry of Agriculture. In the Sulaymaniyah governorate, meat consumption is more than other governorates. Furthermore, Kurdish people eat meat more than Turkish and Iranian but less than Saudi Arabian (Mikdad 2017).

White meat production and consumption

Poultry production in Kurdistan is a comprehensive process, it is including all stages of production such as hatchery, incubating, broiler farm, layer farm, slaughterhouse, and diet production (KRSO 2018). Kurdistan region is witnessing a strange equation; a huge quantity of poultry products is exported to other parts of the country (central and south of Iraq), at the same time, the region imports poultry products from other countries to meet the domestic need. The reason is that the local fields are not enough for the whole region and not compatible with imported meat as well. Therefore, the region exports poultry products to the cities of central and southern Iraq and imports from other countries such as Turkey, France, Ukraine, the Netherlands, Georgia and America (Handy 2017).

The owners of poultry fields say that the government neglected local products while neighbouring countries deliberately fill the markets with poultry products at cheap prices which exceeded their local products and create a competition. The surrounding

countries failing the poultry industry in the region by exporting cheap products. As a consequence, 30% of poultry projects stopped working. Additionally, there is not good coordination between the entrepreneurs and field owners. All these factors hinder the inability of the poultry industry. In term of taste and healthiness, the consumers prefer local meat, but due to availability and its cheap price, they consume imported meat more than the local (Muhamad 2018).

However, from January 2016, the Iraq government banned the import of live birds and poultry products from Kurdistan. The ban cost millions of dollars to the poultry sector because the producers were selling their meat for a higher price to other parts of Iraq, but after the ban, they had to sell it in the domestic market for a cheaper price due to excessive supply. About 10% of producers gave up and large numbers of an employee dismissed. To compensate this, the government tried to find a market for poultry in Syria. However, for consumers, it was an advantage because chicken meat price decreased by 40% since the ban (Bakir 2016).

Despite the crisis, according to the head of the animal production department in the Ministry of Agriculture, the production of chicken meat increased by 40% between 2014 and 2018. In 2013, there were 1,115 poultry farms producing 65,000 tons of chicken. But in 2017, the number of poultry farms increased to 1,389 and production increased to 108,000 tons. This was due to an increase in demand. Mohamad (2018) says, if all the field projects been in work, the volume of annually chicken meat production will reach 166,000 tons, while Kurdistan inhabitants need 138,000 tons per year (KRSO 2017; Muhamad 2018).

The data from the ministry of agriculture shows that poultry farm progresses in Sulaymaniyah governorate is faster that other cities of Kurdistan. Out of the 274 new poultry farms which were set up since the crisis, 124 of them were in Sulaymaniyah. Now the governorate has 518 poultry farms. Agricultural officials in the Kurdistan region are glad that all the obstacles and difficulties could not defeat domestic product. According to a statement of Salah Mustafa, the head of Poultry industry improvement organization, if government manage long term plan to improve poultry production sector and limit the import and support the market of the meat in other parts of Iraq, poultry production will increase two or three times more than what is exist now, and can participate in mitigating the effects crisis in the region by providing job for large number of unemployed and help

government to save the money spends on import of the poultry products (Handy 2017; Mustafa & Muhamad 2018).

Red meat consumption

Prior to the crisis, red meat demand was annually increasing by 10%, due to higher income and population growth. Domestic production was not enough to meet the domestic need; therefore, it was an opportunity for traffickers to bring meat from other countries without good hygiene control. According to the veterinary director at the ministry of agriculture and water resources, cattle are imported mainly from India and Pakistan which are carrying many internal and external diseases such as fleas, lice and worm in the flesh. Officially, cattle were imported from Iran because it was cheaper at that time, but during the high demand, meat was imported from Syria as well. In term of taste, the butchers confirmed that the Iranian meat is not so preferred by the consumers in the region, opposite of Pakistani and Indian meat which are more acceptable. According to a statement from trader Ali (2013), every day, about 600-1,000 animals brought to the market, most of them imported illegally from Syria, Iran, and Turkey. Furthermore, a part of the illegally imported meat was exported from Kurdistan to other parts of Iraq (Ali & Qadir 2013).

The ministry of health in Kurdistan determined the need of red meat for each person as 14.4 kg per year, and according to that, in 2016, the need for red meat was 80,841 tons, while the meat produced domestically was 71,500 tons. However, the head of the of animal health and slaughterhouses department stated that 20% of the animal slaughter outside of the slaughterhouses and thousands of tons of frozen meat imports from outside, and this indicates that consumers in Kurdistan eat meat more than the determined amount. Data from KRSO shows that the value of imported red meat decreased from $728 million in 2013 to $694 million in 2014 (KRSO 2014; Mikdad & Abdalla 2017).

During the crisis, the price of red meat has not declined comparing to other stuff, because most of the meat was imported from other countries. Additionally, the Ministry of Agriculture toughened the conditions of meat import and to insure the safety of imported meat, the Ministry of Agriculture imposed the traders to bring the Ministerial Committees to the country where they buy the meat, therefore, due to all those factors,

the price of meat stayed high while the price of other foods decreased. However, if red meat import does not allow by the government, its price would be much higher because local meat cannot meet the need of inhabitants (Mikdad 2017& Muhamad 2018).

According to Ali B, the head of the slaughterhouse in Sulaymaniyah, and data from the Ministry of Agriculture, inhabitants of Sulaymaniyah governorate eat red meat more than the other governorate. The governorate has the biggest share of slaughtering. For instance, in 2016, the number of slaughtered cattle in whole Kurdistan was 858,92, and from this number, 497,374 was in Sulaymaniyah. Furthermore, 70% of the cattle slaughtered in Sulaymaniyah in 2016 were imported, while more than half of the sheep and goats were provided domestically (Ali 2017 & KRSO 2017).

2.   Aims of the Thesis

Main objective

This research was conducted in Sulaymaniyah city of Iraqi-Kurdistan, where meat is one of the most crucial foods for inhabitants. The city has the biggest share of meat consumption compared to other places in Kurdistan. The main aim of the study is to determine the various factors that influence meat consumption in Sulaymaniyah city.

Specific objectives

- Determining the effect of consumer characteristics: gender, age, and years of schooling on meat consumption.

- Defining the effect of household characteristics: household size and net income on meat consumption.

- Estimating the effect of consumer attitudes: the importance of fat rate and animal welfare and a taste preference for specific types of meat on meat consumption.

- Discovering if the change in income level changes the pattern of meat consumption.

2.1.   Research questions

According to the Ministry of Agriculture 2017, Kurdish people eat meat more than Turkish and Iranian inhabitants. In Sulaymaniyah governorate per capita meat consumption is more than other governorates of Kurdistan (KRG Ministry of Agriculture 2017). Since 2014, because of the economic crisis, the economy declined by 60% compared to preceding baselines, GDP growth rate which is driven mainly by oil, declined from 8% to 3% in 2014 (World Bank Group 2015). Food purchasing power in Kurdish cities has shrunk by nearly half. According to the ministry of agriculture 2017, food import decreased by 22% during the crises while it had reached a peak in 2014 (Office of Statistics in Erbil 2016). During the crisis, the price of food generally decreased because of the declining in demand and per capita purchasing power, but the price of meat relatively stayed high. In this study, we want to know how the patterns and level of meat

consumption have been affected by the crisis and what are the factors that influence meat consumption; hence we can ask the following questions:

1. Do consumer characteristics: gender, age, and years of schooling influence meat consumption?

2. Does meat consumption differ among households with different size and net income?

3. Do consumer attitudes such as importance of fat content and animal welfare and taste preference for specific types of meat consumption affect the level of consumed meat?

4. Does the change in income level since the crisis changed the pattern and level of consumed meat?

3.   Methodology

3.1.   Study area: Sulaymaniyah city

Sulaymaniyah city is located in the centre of Sulaymaniyah governorate in the eastern part of Iraqi Kurdistan. The governorate is surrounded by the mountains, with the area of 20,143 km², having 15 districts and 57 subdistricts. The study area is in the centre of the governorate which has a population about 656,000 and density of 103 per km² (KRSO 2017).
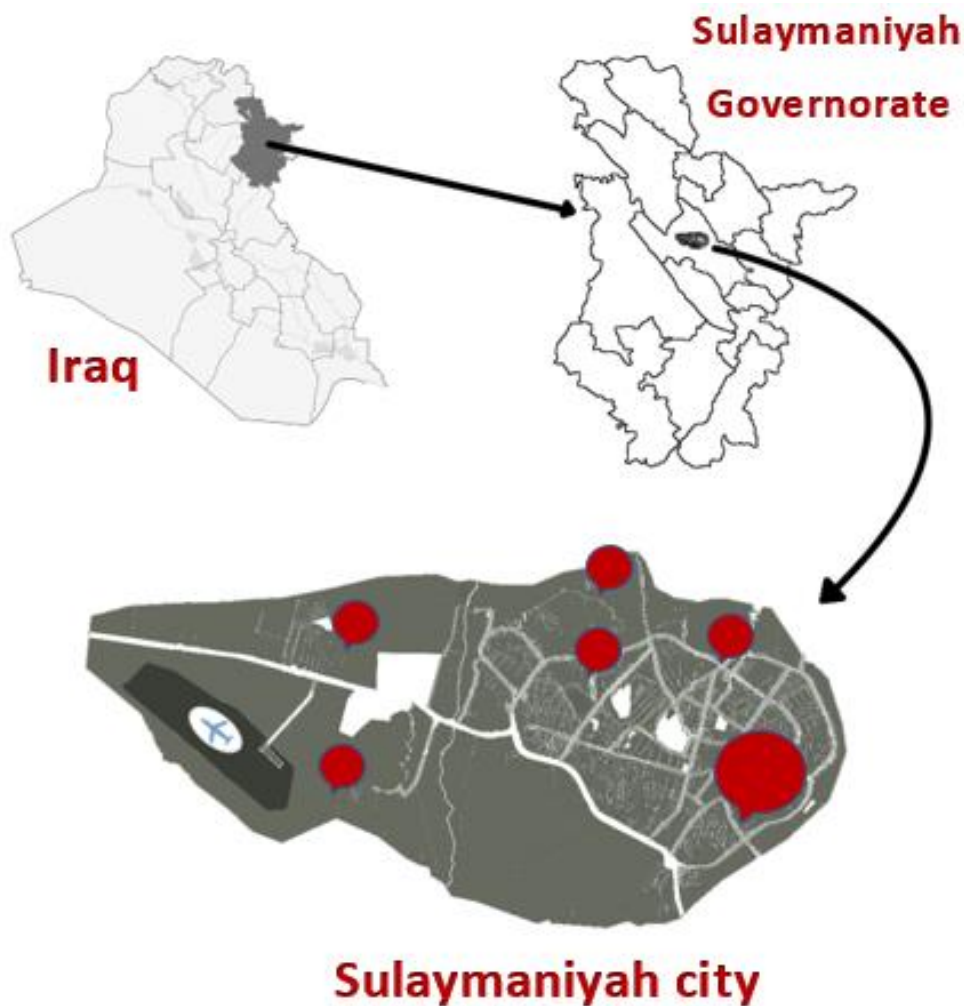

Figure 4. Map of the study site

3.2. Research Design

This study was conducted using quantitative exploratory questionnaire survey. The structured questionnaire was used to collect primary data from the field.

3.2.1. Data sources

Secondary data helped to understand the situation in the different countries in the world before the field work. A concentrative literature review has done to collect information about factors affecting the consumption of meat, worldwide meat consumption and production, the health and environmental consequences of meat consumption and production, agriculture sector situation in Kurdistan. Information was collected using from diverse sources such as Sage journals, Ebook central, Jstor, Scribd, Science Direct, Research gate, WFO, OECD.

Primary data were collected in the field through a structured scale questionnaire-based survey, the questionnaire included closed-ended questions in the form of fixed measurement scales using metric interval Likert and semantic differential scales. The use of closed-ended questions was preferred since the collected data can easily code and analyse and ensured precise responses from the respondents. To guarantee the validity. The questionnaires were edited and corrected with the help of supervisor and pretested before starting the data collection.

3.2.2. Sampling techniques (tools and methods of data collection)

A quota sampling was used to select the respondents entailed those who are living in the Sulaymaniyah city, older than 17 years old and eat meat as well. Due to lack of information and data on meat consumption and consumer characteristics, we performed a short interview with the butchers to obtain information needed for quota sampling. According to their statements, there is no difference in the proportion of male and female who buys meat, also, consumers of all the different ages buy meat, but the proportion is less in aged consumers than the adults. A total number of 233 respondents were interviewed (one person from household). The sample was collected in three different areas with almost equal number of respondents, one of the areas is Bazaar, it is a big free

market located in the western part of the city which has the biggest share of meat market and people from all parts of the city visit it, the second area is several supermarkets and malls in the city, and the third is the public parks. The data were collected from 10. June 2018 to 10. July 2018. The majority of the respondents self-administered to fill in the questionnaire while a few were interviewed or helped due to low education.

3.2.3. Questionnaire design

A structured questionnaire was used to collect primary data in the field, it was considered as most suitable data collection instrument since it needs less time and acts as written interviews which helps to collect information from respondents without the intervention of researcher. The questionnaire held 16 questions; different measurement scales were used to measure the variables, nominal scale to measure the socio-economic characteristics (gender, living place, and occupation), ordinal scale to measure the changes of meat consumption and income level since the crisis, the importance of some characteristics (taste, price and fat content), the share of meat buying to the household, and the net income per month of the household. The continuous scale was used to measure the number of days per week that responder eats meat, age of the responder, years of schooling and the number of household members. The questionnaire was translated in to Kurdish language and contained these parts:

(i) Basic characteristics of respondents: gender, age, and years of schooling.

(ii) Characteristics of household: household size and the approximate amount of net income per month.

(iii) Consumer attitudes toward meat consumption: meat consumption per week, taste preferences for lamb and chicken meat, importance of fat rate, and animal welfare, the share of meat buying for the household, changes in the level of meat consumption since the crisis.

(iv) Change in income level since the crisis.

In this study pork meat did not include because this type of meat is not used in the area due to religious reasons. Additionally, not all the collected data used in the analyses, this is because of the taking of the most important questions.

3.2.4. **Description of demographic characteristics of respondents**

Table 3. Demographic characteristics of respondents

Variable	Description	Number	Percentage	Mean	SD	Min.	Max.
Gender	Male	127	55.5				
	Female	106	45.5				
Age (years)				41.66	16.31	18	88
	18-39	117	50.4				
	36-60	74	31.9				
	Above 60	41	17.6				
Household size		233		4.31	1.72	1	11
Live in city	yes	226	97				
	no	7	3				
Education	Literate	212	91	11.44	5.98	0	25
	Not literate	21	9				

As shown in the table, the respondents younger than 18 years old were not interviewed. Regarding the years of schooling, 9% of the respondents have not attended any school, 14.2% of the respondents finished primary school, 26.6 finished high school, 38.2 % has institute or bachelor certificate, and 11.7 are graduates. Another indicator is household size, which has the mean of 4.3, one person per each household has been interviewed. The majority of respondents live in urban since the survey has been done in the city centre and the respondents have to be from Sulaymaniyah governorate.

3.2.5.　　　Data analysis

Primary data has been analysed through SPSS to accomplish the specific objectives. Multiple linear regression model was used to answer the first, second and third questions which are: the effect of consumer characteristics, consumer attitudes and household characteristics on meat consumption. Other studies (Karli et al. 2017 and Schmid et al. 2017) have used a regression model to discover the relationship between meat consumption and those characteristics. Chi-squared test used to answer the last question which is discovering if the change in income level changes the pattern of meat consumption.

3.2.5.1.　　　Chi-squared test

A Ch^2 test was used to find the relation between income level and meat consumption, the variables were measured through five scales from extremely decreased to extremely increased.

3.2.5.2.　　　Regression model

LRM found as the most suitable model to analyse the continuous and ordinal variables. There are two dependent variables and ten independent variables. Two models used in the regression for each of the dependent variables while the independent variables are the same for both models.

Model specification

As shown in the Table (4), some of the variables determined based of other researches and theory of consumer behaviour, while some variables are exploratory and chosen based on the knowledge of the researcher about the situation and respondents.

Regression equations

$$Y_1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots\ldots \beta_{10} X_{10} + u$$

$$Y_2 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots\ldots \beta_{10} X_{10} + u$$

Y_1: White meat consumption

Y_2: Red meat consumption

β: Coefficient

X_1: Gender

X_2: Age

X_3: Education

X_4: Buying meat for the household

X_5: Household net income

X_6: Household size

X_7: Preferences for the taste of chicken

X_8: Preferences for the taste of lamb

X_9: Importance of fat content

X_{10}: Importance of animal welfare

u: Error term

Table 4. Description of multiple linear regression variables

Variable name	Description	Min	Max	Mean/SD	Source
Dependent variables					
Red meat consumption	A number of the days per week that consumer eats red meat. Measured using a scale from 0 to 7.	0	7	2.88 (±1.79)	(Karlı et al. 2017)
White meat consumption	A number of the days per week that consumer eats white meat. Measured using numbers scale from 0 to 7.	0	7	1.7 (±1.33)	(Clonan et al. 2015)
Consumer individual characteristics					
Gender	Dummy variable used to code the gender of respondents, 0 is given to male and 1 to female.				(Curtis & Comer 2006)
Age	The age of the responded, measured as a continuous variable.	18	88	41.67 (±16.31)	(Schmid et al. 2017)
Education	A total number of years that the respondent has spent in school, measured as a continuous variable.	0	25	11.45(±5.98)	(Dibb & Fitzpatrick 2014)
Purchasing meat for the household	The binary scale used to measure this variable, number 0 is given to the responders who do not buy meat and number 1 to those who buy meat.				Explorative

Table 4. Description of multiple linear regression variables

(Continued from the previous page)

Household characteristics					
Income	Approximate household net income per month. Measured using five levels.	1	5	2.69 (±1.11)	(Gallet 2010); Henchion et al. 2014)
Household size	The number of members per household, measured as a continuous variable.	1	11	4.31 (±1.72)	(Zhang et al. 2018)
Consumer attitudes					
Preferences for the taste of chicken	Taste preference for chicken by respondents, measured as an ordered variable using 5 scales from extremely dislike to extremely like.	1	5	3.95 (±1.18)	(Wong et al. 2015)
Preferences for the taste of lamb	Taste preference for lamb by respondents, measured as an ordered variable using 5 scales from extremely dislike to extremely like.	1	5	4.3 (±1.12)	(Wong et al. 2015)
Importance of fat content	Measured using 5 scales from not important at all to extremely important.	1	5	3.4 (±1.36)	(Ngapo & Dransfield 2006)
Importance of animal welfare	Measured using 5 scales from not important at all to extremely important.	1	5	3.03 (±1.45)	(Mathijs 2015)

From the descriptive statistics of dependent and independent variables, it shows that 82.8% of the respondents buy meat for their family while 17.2% does not buy. 32.8% of the respondents say that fat content is important while for 27.2% is not important. For 52.8% of the respondent, animal welfare is important while for 36% is not important.

Table 5. Description of Chi-squared test variables

| Name of the variable	Description	Min	Max	Mean/SD
Changes in income level since the crisis	Measured using 5 scales from extremely decreased to extremely increased	1	4	2.12 (± .746)
Changes in red meat consumption level since the crisis	Measured using 5 scales from extremely decreased to extremely increased	1	5	2.35 (± .66)
Changes in white meat consumption level since the crisis	Measured using 5 scales from extremely decreased to extremely increased	1	4	2.77 (±.66)

From the descriptive analysis, 71.2% of the respondents determined that their income decreased while 25.3 % remained constant and for 3% increased. 68.8% of the respondents say that their red meat consumption decreased since the crisis, while for 35.2% the meat consumption stayed constant and for 6.4% increased. In term of white meat, 31.3% of the respondents say that they decreased their white meat consumption while 57.9% remained constant and 10.7% decreased their consumption.

4.   Results

## 4.1.   Descriptive statistics of the dependent variables

One of the dependent variables was white meat consumption per week, according to the results, consumer eats white meat more frequently than red meat, this is due to its cheap price and availability as well. Figure (5) shows the frequency of respondents according to their white meat consumption per week.
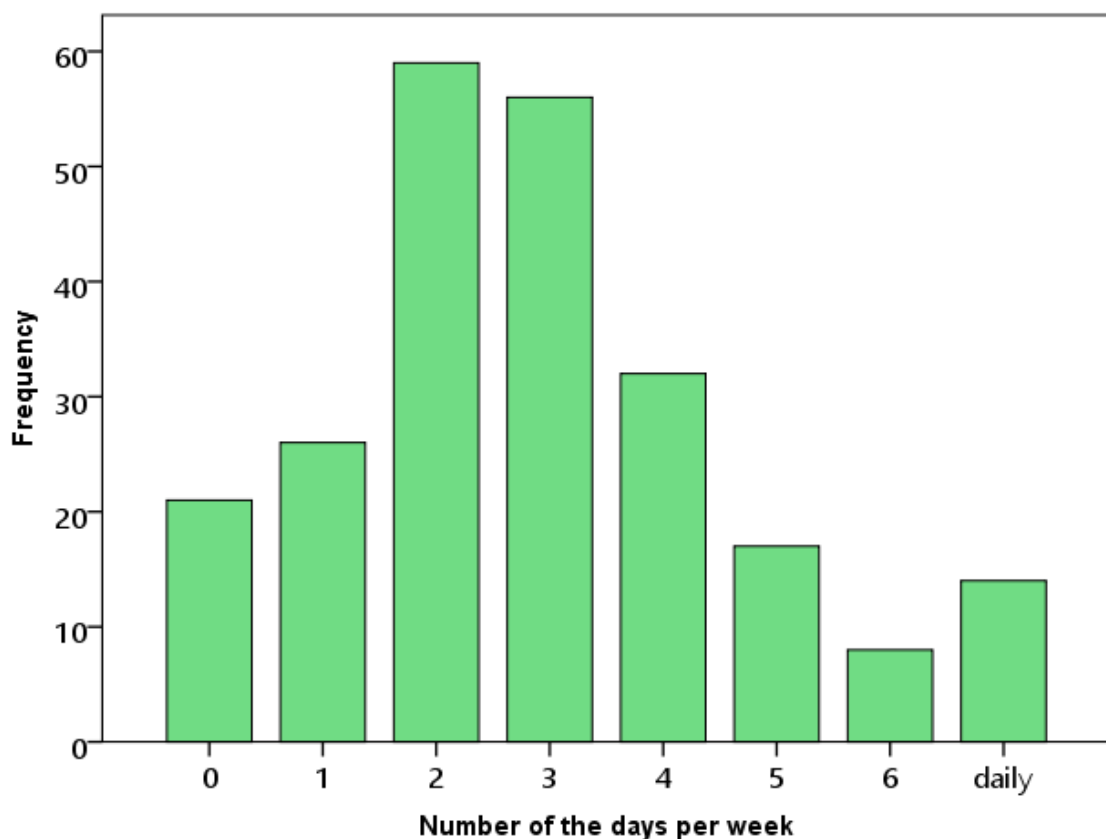
Figure 5. Number of the days per week that consumer eat white meat

Another dependent variable was consumption of red meat by the respondent per week. However, according to the results, consumers highly prefer the taste of red meat and especially lamb (65.2% of the respondents extremely like the taste of lamb and only 4.3% do not like it at all and the rest like it moderately or slightly) but the consumption of red meat is not that much high as their preferences. The main reason can be related to

the price of red meat which is not affordable by everyone. Another reason is availability, consumers prefer to buy fresh meat which is hardly available everywhere and consumers need to go to specific places to buy it. Figure (6) illustrates the frequency of respondents according to the number of days per week that they eat red meat.
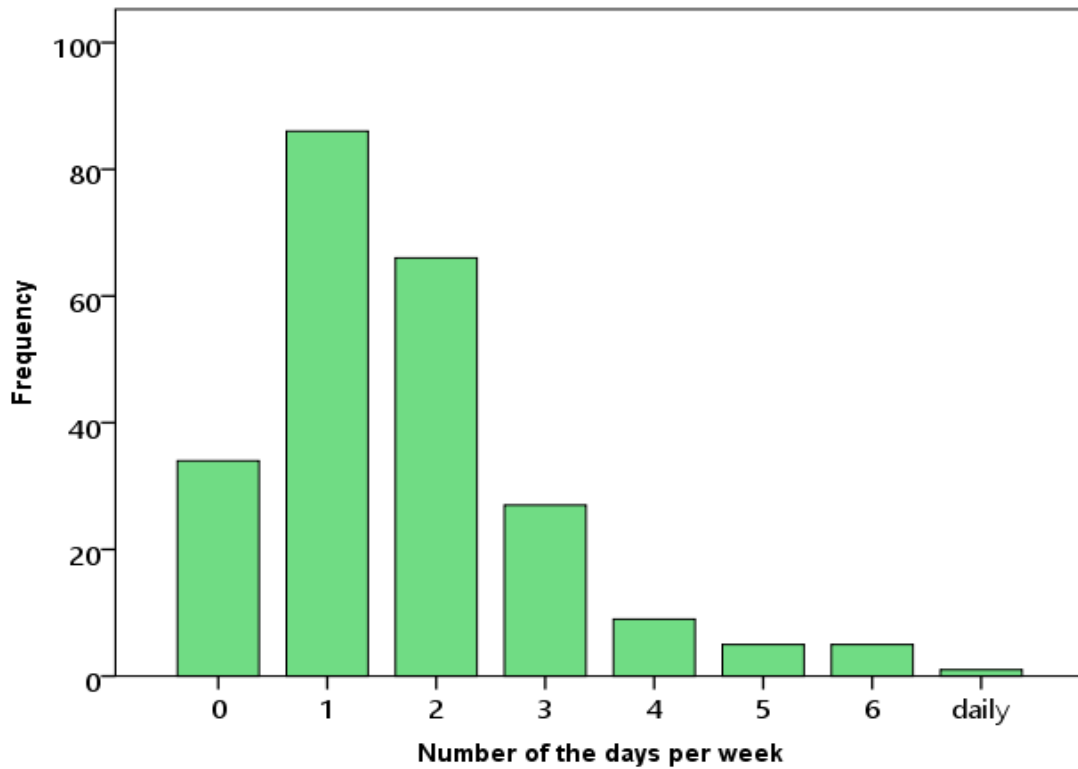
Figure 6. Number of the days per week that consumer eat red meat

As it is visible from both histograms, the consumption of white meat is higher than red meat.

4.2.   Chi-squared test result

White meat

A Chi-squared test was used to discover if the changes in income level since the crisis changed the level and the pattern of white meat consumption. A significant relation was found: X^2 (9) › 52.8, p = .000

Red meat

A Chi-squared test was used to discover if the changes in income level since the crisis changed the level and the pattern of red meat consumption. A significant relation was found: X^2 (12) › 99.39, p = .000

Household net income per month

Net income has the greatest effect on meat consumption. Measured using five levels to determine the approximate amount of household net income per month as shown in Figure (7). The levels were determined based on the current situation in which the income has decreased severely due to the economic crisis. In the questionnaire, IQD was used, but here in the Figure, we present USD to make it comparable to other countries.
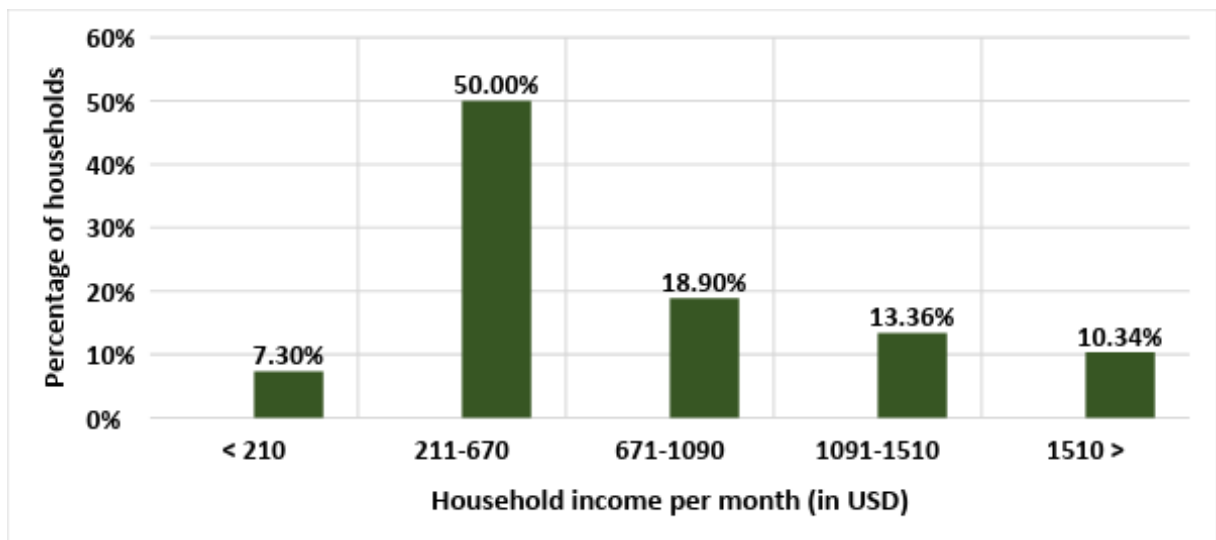
Figure 7. Approximate amount of household income

Currency exchange rate: 1 USD = 1193 IQD (July 2018)

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4.3.   Multiple Linear Regression model result

The assumptions of linear regression model have been tested through SPSS and from the test's result, there is a linear relationship between the dependent and independent variables, the data are normally distributed, there is not endogeneity and no multicollinearity between exogenous variables.

Multiple linear regression was calculated to predict white meat consumption by independent variables mentioned in Table (6).

Table 6. Linear regression table of result for white meat consumption

Variables	Coefficients	St. Error	P-value
Consumer individual characteristics			
Gender	-.608	.247	.015**
Age	.016	.009	.076*
Education	.20	.025	.432
Purchasing meat for the household	-.337	.322	.297
Household characteristics			
Income	.260	.122	.035**
Household size	-.014	.073	.847
Consumer attitudes			
Preferences for the taste of chicken	.254	.099	.011**
Preferences for the taste of lamb	-.159	.105	.131
Importance of fat content	-.146	.089	.103
Importance of animal welfare	-.016	.081	.845
Constant	3.799	1.056	.000***

$p<.1$*, $p<.05$**, $p<.01$***

($F_{(10,209)} = 4.258$, $P<.000$), R^2 (.169)

Table 7. Linear regression table of result for red meat consumption

Variables	Coefficients	St. Error	P-value
Consumer individual characteristics			
Gender	-.029	.177	.872
Age	.004	.006	.529
Education	.018	.018	.316
Purchasing meat for the household	-.087	.231	.709
Household characteristics			
Income	.301	.088	.001***
Household size	.060	.052	.254
Consumer attitudes			
Preferences for the taste of chicken	-.074	.071	.299
Preferences for the taste of lamb	.185	.075	.015**
Importance of fat content	-.205	.064	.002**
Importance of animal welfare	.020	.058	.736
Constant	.515	.758	.498

p<.1*, p<.05**, p<.01***

(F (10,209) = 4.686, P‹.000), R^2 (.183)

5.   Discussion

After applying the multiple linear regression model, the answers for each of the research question were found.

Demographic characteristics

The first specific objective is to know if the demographic characteristics: gender, age and education; are influencing meat consumption. We found that gender and age are significantly related to white meat consumption, in a way that men consume white meat in larger quantities than women. The reason can be related to the fact that women are more taking care of their health and body weight. Additionally, in that culture women usually stay at home and prepare the majority of meals, hence they have more options of food varities to consume, while men are mostly staying outside and eat meals frequently out in the restaurants and fast-food places which are mostly focused on meat in that area. Our results concluded with similar findings of Clonan et al. (2015), who pointed out that women eat less meat than men. Furthermore, Curtis & Comer (2006) discovered a positive link between been being a vegetarian and feminism. However, our study was not determining this sociological characteristic, it is possible that this trend (the rise of feminism connected with vegetarianism) can also prevail in the Kurdish society in the future. Our findings were in contradiction with the study conducted by Schmid et al. (2017), which suggests that males consume more meat than females for all types of meat except poultry.

Age was another feature we tested in this study. We found a positive significant (p<0.1) relation between age and white meat consumption. Our study is therefore in the direct opposition to Clonan et al. (2015), who reported that meat intake is higher among young males and lower in older women aged between 46-60 years old. While Schmid et al. (2017) refused any link between age and meat consumption. Meat contains a considerable amount of cholesterol (Meat Science and Nutrition 2012), and this may cause a reduction in meat intake by aged consumers. However, this is more connected to red meat since it contains more fat, but in our study, the age is paradoxically not significantly influencing red meat consumption. The explanation can be that the red meat is highly preferable by inhabitants and the disadvantages have not led to a reduction in the consumption even by the older consumers.

Another characteristic of the consumer was education level. We found that there is no significant relation between education and meat consumption for both white and red meat. The education level of consumers in Iraqi Kurdistan is generally low, especially in aged consumers. At the same time, educated consumers have higher income and this may be another reason why meat consumption is high among educated consumers. Some studies such as Schmid et al. (2017) and Zhang et al. (2018) also did not find a significant relation between education and meat consumption. At the same time, many other studies found that there is a link between education and meat intake. Karli et al. (2017) show that meat consumption is lower among more educated consumers. Furthermore, Dibb & Fitzpatrick (2014) pointed out that higher educated consumers concern more about production source, but they consume more of sheep meat which can be related to having a higher income.

We also tried to find out if the purchasing of meat by consumer has any connection to his/her level of meat consumption, but according to the results, this property does not affect the level of meat consumption by consumers which means that even those who never buy meat for their family (which was count for 17.2% of respondents in our study), they consume meat as much as those who buy meat for their family.

Household characteristics

The second specific objective was to determine the effect of household characteristics of consumers on meat consumption. The characteristics were household income and household size. In our study, household income has the biggest effect on meat consumption. We found that income is significantly related to both of white meat ($p<.035$) and red meat ($p<.001$). As it is visible from the P-values, the effect is higher in the case of red meat. The reason is connected to that red meat is more expensive and strongly affected by the financial situation of the household, while white meat is cheaper and more affordable. Existing studies also uncovered the relation between income and meat consumption. A paper by Gallet (2010) indicated that meat demand is elastic to price, which means that their consumption has reaction to price, additionally the effect was higher in the consumption of beef than lamb and poultry. Furthermore, according to Campo et al (2008), in the countries where the lamb is more costly, consumption is low, while in the countries with lower price, the lamb is one of the most frequently used meat.

Results from Mao et al. (2016) shows that the effect of income and price on meat consumption is more visible among poor societies and rural areas. In Africa, the consumption of meat in higher income societies such as South Africa is more than other parts of the continent. However, those conclusions explain that meat consumption increases with the increase of income, at the same time, this positive relation will not continue forever but has a limit and will reach the level of saturation after some period, this is proved by Henchion et al. (2014) who found that income does not affect the consumption of meat among high income consumer because they focus more on quality than price.

Household size was another feature that was used in the regression. In our study, we have not found any significant relation between household size and each of white and red meat consumption. Research by Zhang et al. (2018) also reported that household size is not related to meat consumption. While some other studies such as Schmid et al. (2017) found that household size is positively associated with the level of meat consumption. Furthermore, Fraser et al (2000), reports that the married consumers eat meat more than singles which means that there is a positive relation between household size. Another study by Sacli (2018) found that the share of meat purchase from expenditure increases with having more members in the household.

Consumer attitudes

The third specific objective was defining the effect of consumer attitudes on meat consumption. In our study, we have three attitudes. One is the preferences for the taste of chicken and lamb. We found that there is a positive significant ($p<.011$) relation between preferences for the taste of chicken and white meat consumption, as well as, positive link ($p<.015$) between preferences for a taste of lamb and red meat consumption. This illustrates that the consumption of a specific type of meat is increasing with the preferences for the taste of that type. Research by Wong et al. (2015) in Australia which has the biggest share of per capita meat consumption, reveals that during the last fifty years, consumer changed the pattern of their meat consumption from beef, lamb and mutton to chicken due to change in preferences for the taste. However, the preference alone cannot determine the consumption pattern, but it is connected to price and income as well. In our results, however, the preferences for the taste of lamb is high among

consumers, (65.2% of the respondents like the taste of lamb), but the consumption of chicken meat is higher than in lamb because lamb is more expensive. Morales et al. (2008) also conclude that the purchasing of ham is increasing with the increase in the preferences for the taste of ham. In our results, the preferences for the taste of white meat (chicken) is not significantly related to the level of red meat consumption, but according to the coefficients, red meat consumption decreases by -.074 with the increase of preferences for white meat and white meat consumption decreases by -.159 with the increase of the preferences for red meat. this explains that with the rising of the preferences for the taste of a type of meat, the consumption of another type decreases, which means that preferences for the taste are important to determine the level of meat consumption however the p-values were bigger than alpha.

Fat content is another important feature that has an impact on meat consumption, meat contains relatively higher cholesterol than other non-animal-based foods. It was found by Grunert (2006) that fat content is one of the most important factors that evaluate the quality of meat. Meat with less fat (leaner meat) has higher quality and it is healthier. According to Ngapo & Dransfield (2006), the preferences for leaner beef is increasing over time. In our result, fat content is significantly related to red meat consumption but not to white meat. This is possible because red meat contains more cholesterol and have a negative impact on health, especially in aged consumers. While white meat is safer.

Another feature was the importance of animal welfare for consumers, the concerns about animal welfare are increasing and many studies confirmed that it helped to reduce meat consumption, such as Mathijs (2015) and Latvala et al. (2012). A study in the UK by Clonan et al. (2015), shows that 88.5% of the respondent concern how the place where the meat is produced is providing standards of animal welfare during slaughtering. Another survey, Dibb & Fitzpatrick (2014) reports that more than a quarter of the respondents are willing to pay 10% more for the meat which is produced with higher animal welfare standards. In Kurdistan region, the concerns about animal welfare are less than in advanced countries, however half of the respondents say that animal welfare is important for them but in the results, there was not a significant relation between importance of animal welfare and meat consumption for each of red and white meat. It confirms that importance of animal welfare for consumers does not reduce meat consumption. Factors such as culture and religion can have an influence on this result.

Last but not least, it is also important to note to the issue of animal welfare, that the vegetarianism is rarely seen among inhabitants of the region. As the evidence for this claim, during our data collection, there was only one approached person, who stated that he is vegetarian, and he was therefore omitted from the respondents.

Change of the patterns of meat consumption since the crises

From the price point of view, poultry meat is for the poor and beef for the rich. The consumer may change the pattern of meat consumption due to some factors, of which income is the most important (Benda, Prokeinova & Hanova 2016). In our study, we found that both of red and white meat has been reduced in their level of consumption since the economic crisis that led to a dramatic reduction in income, but as shown in the Figures (8, 9), the reduction in red meat is higher than of white meat. This result has a link to the price of meat in which the price of red meat is higher that white meat. As a consequence, consumer reduced their red meat consumption and replaced it with white meat.

According to Henchion et al. (2014), patterns of meat consumption globally changed toward using of more white meat and less red meat, this is due to the high price of red meat and low price of white meat. At the same time, Mathijs (2015) argue that however there is a relation between income and animal-based foods, still, the patterns of meat consumption are not clear. Furthermore, Wong et al. (2015) determined chicken meat as necessary food which means that it has less reaction to change of the income or price, while beef was indicated as a luxury food.

Figure (8) shows the frequency of changes in white meat consumption since the economic crisis. As it is visible in the histogram, the frequencies are higher in the middle of the scale which indicates that their white meat consumption did not decrease much and was more stable.
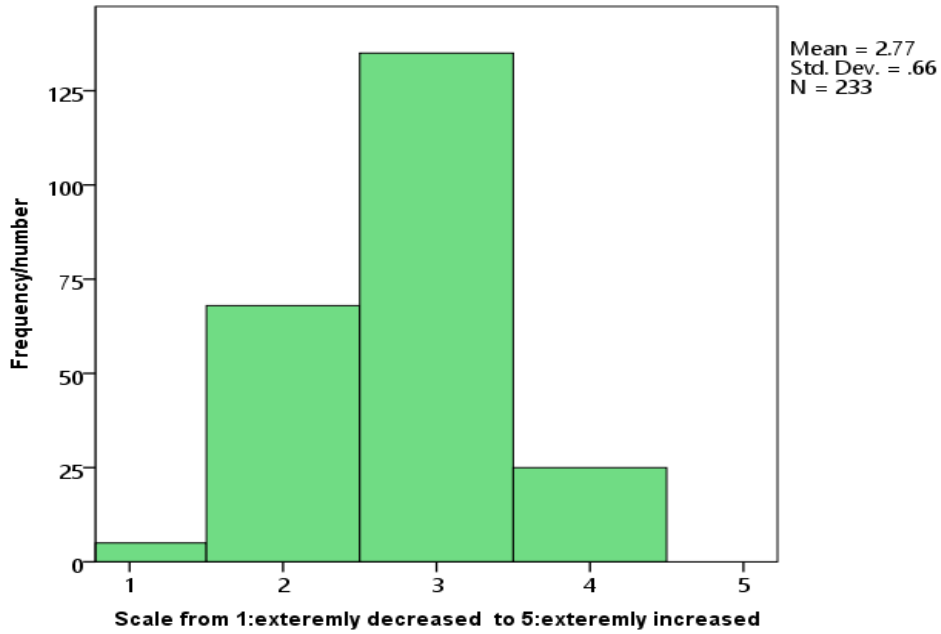
Figure 8. Change in the level of white meat consumption since the crisis

Figure (9) explains the frequency of respondents selecting their change in the level of red meat consumption since the economic crisis. It is clear from the histogram that the frequencies are higher at the beginning of the scale which indicated that their red meat consumption was decreased more than to be stable or increase.
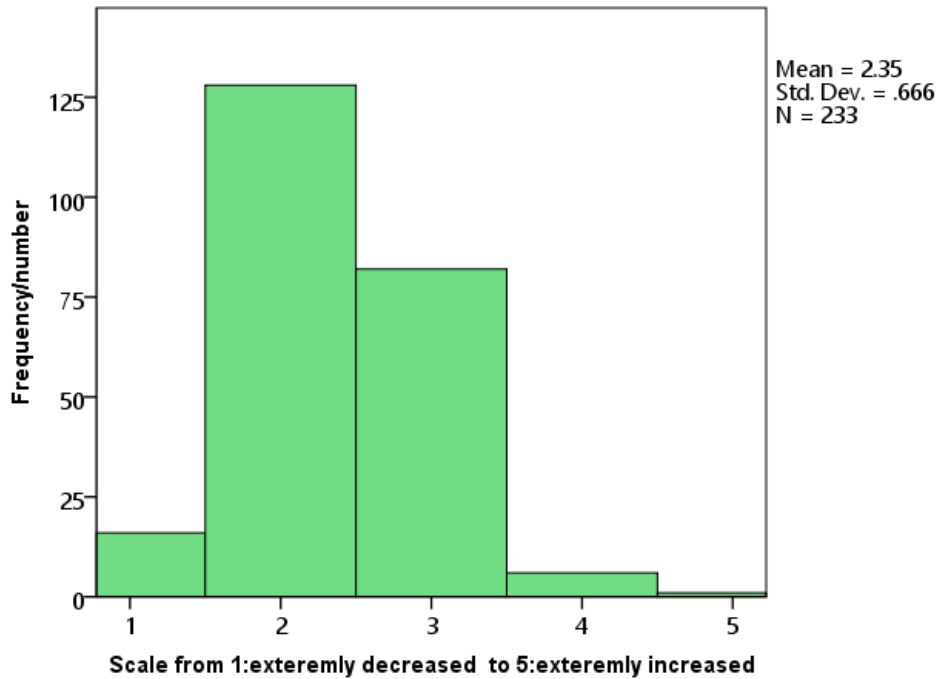
Figure 9. Change in the level of red meat consumption since the crisis

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6.   Conclusions

Meat has cultural and social importance for inhabitants of Sulaymaniyah city, however, its consumption was affected by the economic crisis that started in 2014. The main driver of meat consumption in the area was income, which has decreased considerably since 2014 and led to a decrease in the level of meat consumption. Other drivers such as gender, the importance of fat content and taste preferences also had a significant impact on meat consumption for the consumers in Sulaymaniyah city. While animal welfare, age, education, household size and share of meat purchasing for the family did not have a significant influence on meat consumption. Since the crisis, the pattern of meat consumption shifted from red meat to white meat, this is due to the lower price of white meat comparing to red meat.

This study can help meat producers and seller to improve their meat marketing strategies, through understanding the nature of consumer and discovering the main drivers of consumption. At the same time, the study can fill a small gap in the area of consumer behaviour and support researchers by using the data as a secondary source during performing other researches. There are very little information and studies regarding consumer behaviour in relation to meat consumption in the area. This hinders the producers and wholesalers to know the consumption patterns and consumer expectations. For further research, I recommend performing more investigations and observation of consumer behaviour to fill the existing gap in that field of study. Another recommendation is to policy makers and the Ministry of agriculture to arrange the rules and monitor the import of meat because a huge amount of meat is imported illegally through the borders which distort the market of local meat due to its low price and this hinders the producers to continue on meat production. This is besides that the imported meat does not have any hygiene standards.

The limitations of the study are the inability to generalize the results to other areas of Kurdistan region, this is because the data have not been collected randomly but only the inhabitants of Sulaymaniyah city had been selected. Another challenge was the low response rate due to many invalid respondents such as migrants from other regions.

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Appendices

List of the Appendices:

Appendix 1: Attached copy of Questionnaire in English

Q.1./ How many days per week you have white meat in your diet?

Less than one day ☐

1 day ☐

2 days ☐

3 days ☐

4 days ☐

5 days ☐

6 days ☐

Daily ☐

Q.2./How many days per week you have red meat in your diet?

Less than one day ☐

1 day ☐

2 days ☐

3 days ☐

4 days ☐

5 days ☐

6 days ☐

Daily ☐

Q.3/Where do you buy meat?

	1	2	3	4	5
A. Supermarket	Never	Rarely	Sometimes	Often	Very often
B. Bazaar	Never	Rarely	Sometimes	Often	Very often
C. Other	Never	Rarely	Sometimes	Often	Very often

Please specify)………………

Q.4/ How do you like the taste of the following types of meat?

	1	2	3	4	5
A. Beef	Dislike	Slightly like	Moderate	like	Extremely like
B. Lamb	Dislike	Slightly like	Moderate	like	Extremely like
C. Chicken	Dislike	Slightly like	Moderate	like	Extremely like
D. Turkey	Dislike	Slightly like	Moderate	like	Extremely like

Q.5/ How important are the following characteristic for you ?

	1	2	3	4	5
A.Taste	Not at all important	Slightly important	Moderately important	Important	Extremely important
B.Price	Not at all important	Slightly important	Moderately important	important	Extremely important
C.Fat rate	Not at all important	Slightly important	Moderately important	important	Extremely important
D.Hygiene	Not at all important	Slightly important	Moderately important	important	Extremely important
E.Color	Not at all important	Slightly important	Moderately important	important	Extremely important
F.Animal welfare	Not at all important	Slightly important	Moderately important	important	Extremely important

Q.6/ During the last 4 years, your red meat consumption per week has:

1	2	3	4	5
Extremely decreased	Decreased	Remained constant	Increased	Extremely increased

Q.7/ During the last 4 years, your white meat consumption per week has:

1	2	3	4	5
Extremely decreased	Decreased	Remained constant	Increased	Extremely increased

Q.8/ During the last 4 years, your income per month has had these following evolutions

1	2	3	4	5
Extremely decreased	Decreased	Remained constant	Increased	Extremely increased

Figure 10. Attached copy of the questionnaire in the English

Q.9/ What is your gender?

[ ] Female

[ ] Male

Q.11/What is your age? .... Years

Q.12/Number of the household members ....

Children (1-18 year) ....

Adults (19-65) ....

Retired (above 65 years) ....

Q.13/ where do you live?

[ ] City

[ ] Suburb

[ ] Rural Area

Q.14.A/ What is your educational status?

[ ] Not literate

[ ] Literate

B/How many years all together you has spent in school?
....

Q.10/ Which share of meat you buy for your family?

1	2	3	4	5
Never buy	Quarter	Half	Three quarter	All

Q.15/ What is your household net income per month?

[ ] less than 250,000 IQD

[ ] 251,000 – 800,000 IQD

[ ] 801,000 – 1,300,00 IQD

[ ] 1,301,000 - 1,800,000 IQD

[ ] Above 1,800,000 IQD

Q.16/ What is your occupational status?

[ ] Government employee

[ ] Private employee

[ ] Unemployed

[ ] Student

[ ] Retired

[ ] Gainer

[ ] Other

Figure 10. Attached copy of the questionnaire in the English (2nd page)

Appendix 2: Photographic documentation

Figure 11. Data collection in Sulaymaniyah.

(Source: Author)

Figure 12. Data collection. The author with respondents.

(Source: Author)

Figure 13. Data collection. The author in bazaar of Sulaymaniyah.

(Source: Author)