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“Born to Eat Meat”

Analysis of perceived barriers towards switching and following
plant-based diet among young people in Almaty

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Abstract

Kazakhstan is a middle-income country which is going through the global phenomena of nutritional transition. One of the characteristics of the transition is increase in red meat consumption associated with growing incomes. Public Health diseases and environmental challenges caused by the transition are starting to take place in the country. Plant based diet is recognized and suggested as a sustainable alternative to prevent the health and climate consequences. The study uses mixed-method approach to analyze the perceived barriers of switching to such diet among young people of Almaty. The results have identified three major barriers: a) little awareness of the adverse effects of red meat intakes b) the culture of meat and hospitality b) accessibility and affordability of meat-free products.

Keywords: red meat, plant-based diet, youth, Almaty

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Abbreviations & Acronyms

AICR - American Institute for Cancer Research

CHD & CVD - Cardiovascular and coronary heart disease

GHG – Greenhouse Gases

FAO - Food and Agriculture Organization

FGD – Focus Group Discussion

HFSS - Foods High in Saturated Fat

HMV - health-motivated vegetarians

IARC - International Agency for Research on Cancer

KAP – Knowledge, Attitude, Practice

LMIC - Low- and middle-income countries

NCD - Noncommunicable diseases

SDG – Sustainable Development Goals

T2D – Type 2 Diabetes

UN – United Nations

WHO – World Health Organization

WCRF - World Cancer Research Fund

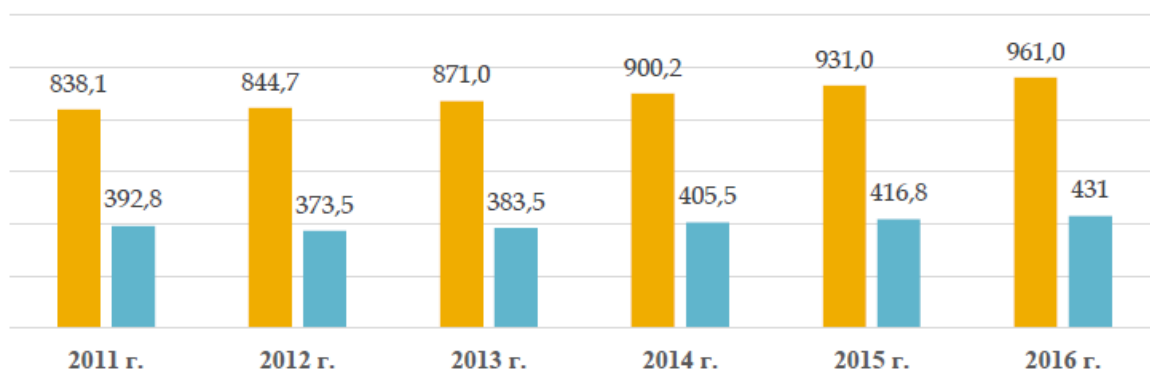
1. Introduction

1.1 The nutritional transition in the world and Kazakhstan

The nutritional transition is the global phenomenon which is described as the transition in diet and physical activity patterns, leading to an energy-dense diet and a sedentary lifestyle (Doak & Popkin, 2017). The impacts are most evident in the developing world where countries have experienced fast shifts from famine to the prevalence of nutrition-related noncommunicable diseases (NCD) such as overweight, obesity, and related chronic diseases which are linked to the rapidly changing dietary and physical patterns (ibid). One of the major trends of the transition has been an increase in production and consumption of red meat in urban areas of low- and middle-income countries (Boutron-Ruault et al, 2017). This growing demand is one of the contributing factors towards global climate change (Doak & Popkin, 2017). The livestock is fed with almost one third of total grain which could be consumed by humans in local economies. Moreover, beef production accounts for six times more greenhouse gases than plant-based products, such as peas and requires 36 times more land to produce (Poore & Nemecek, 2019).

The nutritional transition and its impacts can also be observed in Kazakhstan, a middle-income country located in Central Asia, where the average consumption of meat per person has grown from 65.9 kg/year in 2011 to 72.9 kg/year in 2017 (Rankings KZ, 2017). This increase is largely associated with positive economic growth and a steady increase in meat production in the country (figure 1) (ARG Group, 2017 p 44)

Figure 1, Total meat (yellow) and cattle production (blue) in Kazakhstan (ARG Group, 2017, p. 44).



Nevertheless, a recent World Health Organization (WHO) report shows that there is an increase in the proportion of the population being overweight and obese in Kazakhstan (WHO, 2017; Fursov et al, 2017). The existing implementation of core health interventions to address

nutrition and physical activity has been described as limited (ibid). Moreover, Kazakhstan has one of the highest rates of premature mortality in European region due to NCD that are often linked to the rapid change of dietary patterns (WHO, 2017).

According to WHO (2017), food policy changes are considered as a major way for improving nutrition, however, they are not effective enough without shifting the culture of eating. Though the culture of eating in Kazakhstan has been historically dominated by large meat intakes, there is a knowledge gap in studying why do exactly people eat meat and what do they know about it.

1.2 Purpose and research aim.

The purpose of this thesis is to explore the knowledge, attitudes, and practices (KAP) of red meat consumption among young people in Almaty. There are two main reasons for choosing this geographical place and demographic group. Firstly, Almaty is the largest city with a population of around 2 million people and the average meat consumption rate of 83.5 kg per person a year (second highest in the country) (Rankings KZ, 2017). The region also has the highest amount of livestock production businesses and cattle reaching almost three million heads (ARG Group, 2017). Secondly, the current health dynamic is slowly adding a pressure on the overall economic development especially when the country's population is growing old and the supply of a healthy working age group will soon may not meet the demand (Matrekov, 2018). The target group of this study is young people aged 18 - 30 as they are the ones who will be the active labor for the next four to six decades and the health of this group directly impacts the economic costs and benefits for the state.

The objective of the study is to understand what are the existing barriers to switching and following more sustainable meat consumption patterns. This is done using KAP framework as the guiding tool for the study. The research questions following the thesis are:

- What is the existing knowledge about red meat and its health and environmental impacts?
- What are the existing attitudes towards red meat consumption and a vegetarian lifestyle?
- What are the existing practices in red meat consumption among young people in Almaty?

1.3 Scope and limitations

The study aims to contribute to the development field by drawing the parallels between the results and selected Sustainable Development Goals (SDGs) for 2030.

The study is based on the existing research related to red meat consumption and its effects on health, environment, responsible production & consumption. These topics are specifically addressed in SDGs #3 Good health & Wellbeing, #12 Responsible consumption and production,

#13 Climate action and intertwine with the rest of 17 goals. This study has the most relevance for the following SDG sub-targets:

3.4 By 2030, reduce by one-third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being

12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning.

The SDGs identified and the specific sub-targets mentioned above are discussed in greater detail in conjunction with the findings of the study in the analysis chapter of the thesis.

Finally, the thesis is mainly focused on exploring existing opinions and ideas among people in Almaty and the results explore and analyze the existing barriers of switching towards more plant-based diet. The study, however, does not focus on presenting potential solutions to those barriers nor does it provide any policy recommendations.

2. Analytical framework

Each scientific study is built on theories and concepts where a theoretical framework is used as a guiding tool throughout the paper. Many existing health-related frameworks that wish to study barriers towards switching to a healthier lifestyle draw their attention on individual and community level factors (U.S. Department of Health and Human Services, 2005). The study of community-level requires the consideration of existing policies, rules, regulations, and norms while the study of individual-level factors can be based on the analysis of common beliefs, knowledge and behaviors of the target population (ibid). Since there is no specific theoretical framework in studying these 3 variables, the study is based on the analytical tool instead.

This thesis implements Knowledge, Attitudes, and Practices (KAP) survey enhanced by the WHO as its analytical framework in order to examine the existing barriers towards switching to a plant-based diet from the individual perspective (WHO, 2008).

2.1 Knowledge Attitudes and Practices

The KAP survey is a representative analysis of a specific population to gather the existing information on what is known, believed and done regarding a particular topic (WHO, 2008). KAP has been developed in the 1950s and has been widely used to investigate health behavior and health-seeking practices (Launiala, 2009). The main advantages of KAP are an easy and straightforward design, ability to quantify data and application of small sample results to a larger population (ibid). The data is collected using a structured and standardized questionnaire which is then analyzed quantitatively and/or qualitatively. The main rationale behind choosing the KAP survey is that it assist in identifying knowledge gaps, cultural beliefs, or behavioral patterns that in turn result in existing barriers for a healthier behavior (WHO, 2008). KAP survey results are especially helpful when conducted on the early stages before the appropriate policies are adopted. This goes in line with existing realities of Kazakhstan, as the country is currently in need of an integrated healthy eating strategy which could be created in collaboration with all relevant stakeholders within nutrition and NCD fields (WHO, 2019).

The development of KAP begins with defining survey objectives based on the existing information (WHO, 2008). To this date, there has been no research studying the existing knowledge between meat consumption and impacts on health & the environment among young people in Almaty. Similarly, there is no research about existing attitudes towards plant-based vs. meat-based diet among the target population. Although there is existing research about the practices of meat consumption (amount, frequency and type), it only considers the population of the country as a whole group (ARG Group, 2017), (Ranking KZ, 2018). Thus, there is a gap in identifying the existing practices specifically among the young people of Almaty. Therefore, the

objectives of the KAP in this research is to a) study the current knowledge related to meat consumption, environment, and health b) attitudes towards plant-based and meat-based diet as well as c) existing meat consumption practices (type & frequency) (figure 2)

Figure 2: Knowledge, Attitudes, Practices Model (researcher's own construct based on WHO, 2008)



When the objectives are set and research areas are identified, the survey questions are developed (WHO, 2008). The research is based on the KAP survey which consists of the four main blocks. The first block provides information about the purpose of the study to all the respondents and gathers the background information such as age, education, and family status. The next three blocks are split according to the analytical tool: knowledge, attitudes, and practices of meat consumption (appendix A). In the knowledge section, respondents are presented with the statements regarding meat consumption and impacts on the health & environment. Participants are asked to either agree, disagree or abstain from the answer based on their own knowledge. The attitudes section asks respondents to evaluate to what extent they find meat based or plant-based diets attractive (based on taste, affordability, nutritional value and cooking time). Finally, the practices section is aimed at assessing what kind of meat young people consume (processed vs unprocessed), how often, and in what shape and form.

When the questions and survey are complete, it is distributed to the target population. In the case of the thesis, the majority of responses were collected online using google forms while a small percentage was transferred from the paper forms. Finally, when the responses are collected, the data is analyzed and presented in order to further develop key arguments and answer the research questions (WHO, 2008).

2.2 Limitations of KAP

All studies have unique purpose and objectives and there is no 'one fit for all' theory or analytical framework. One of the limitations of using KAP is that the results are influenced by the design of the questions (open vs close-ended). As such it is not possible to capture and take into account

every factor in certain questions. For instance, in a question like ‘what are the most important properties when buying meat?’ one can come up with a list exceeding more than 10 properties which of course cannot be all included in a close-ended question. KAP findings should be complemented and interpreted in line with the qualitative findings in order to strengthen the validity of the findings.

Furthermore, Launiala (2009) argues that many KAP studies sometimes do not elaborate on the results regarding attitudes due to a risk of generalization of the opinions of the target group. In addition to that, KAP results are often interpreted with the assumption that there is a direct relationship between the existing knowledge and practices (Launiala, 2009). However, the knowledge is only one of the many factors influencing the behavior along with socio-cultural, economic, environmental and etc. (ibid).

3. Literature review

The following section describes the phenomena of nutritional transition, how it influences the livestock sector and in what way current meat consumption patterns contribute to public health and the environmental change.

3.1 Nutritional transition

The concept of nutritional transition tackles transition in dietary habits due to the changes in food production (Caballero & Popkin, 2002). In addition to that, it covers the health effects that are caused by the shift as well as changes in lifestyle and physical activity (ibid). Caballero & Popkin (2002) believe that the most significant shift in food supply, dietary choices and lifestyle is present in the developing countries. This is based on several reasons. First, the forecasted population growth in the next few decades will occur in developing countries and most importantly in urban areas where the nutrition impact is the most significant and evident. Second, nutritional transition continues to cause increase in NCD, and the trend will keep impacting the countries of global south (Caballero & Popkin, 2002).

The Nutritional transition is driven by several factors such as urbanization, globalization of food production, accessible media and communication as well as a global shift to low-energy output labor (ibid). Globalization and use of modern technologies to satisfy mass demands, decrease the price of several food items, including meat and allows countries to export and import from each other (D'Silva & Webster, 2017). The major increase in meat and cereals demand is happening in the developing world. The dietary trend is also greatly influenced by the positive income trends in LMIC. Caballero & Popkin (2002, p.4) argue that:

‘As economic status and education improve, populations in developing countries around the world respond quite consistently by demanding more animal protein in their diet. In many cases, this demand is justified, since their typical diet is usually low in zinc, iron, selenium, retinol, and other essential nutrients found primarily in animal sources. However, increases in the animal protein content of diets almost invariably increases the content in saturated fats, which is undesirable’

3.2 The impact of meat consumption on health

The intake of red, processed meat has been increasing in correlation with the economical development of a country (Wyness et al, 2011). This has especially been the case after the Second World War when high meat consumption was perceived as a healthy habit until the research on the health effects had started to be conducted (ibid).

Epidemiologic studies have been analyzing the relationships between meat consumption, mortality and chronic disease since 1970s (Boutron-Ruault et al, 2017). Over time the meat has been categorized based on their iron content, meaning red (beef, lamb, pork) or white (chicken, turkey and etc) (Boutron-Ruault et al, 2017). Within those categories, meat has been further split

into processed, meaning any types of flavor or preservation enhancements and unprocessed meat which is free from preservatives (ibid). To date, many studies have found a positive correlation between processed meat consumption and increase in frequency of type 2 diabetes, some kinds of cancers and cardiovascular diseases (CVD) (Fardet and Boirie, 2014). Nevertheless, one of the major challenges of comparing the studies is lack of defined standardization (Boutron-Ruault et al, 2017). For instance, some studies considered both processed and unprocessed meat or both red and white meats while other research have compared them separately (ibid). In addition to that, Wyness et al (2011) argue that drawing the relationships between the meat and the frequencies of the disease is complicated since meat is consumed along with other components like rice, vegetables, pasta and so on. Lately, research has been studying the health-related associations based on overall dietary behaviors and patterns compared to only kinds of meat consumed (Boutron-Ruault et al, 2017). Nevertheless, research that takes behavior pattern into account, still indicates that the relationships between meat consumption and NCDs such as CVD, some types of cancer, obesity and diabetes remains positive (ibid).

3.2.1 Cardiovascular and coronary heart disease (CHD & CVD).

The effects of red meat consumption on of CVDs and CHDs most often depend on the processing (Rayner & Scarborough 2017). It was found that the higher probability of CVDs and CHDs relates to high intake of processed meat while smaller or almost 0 probability relates to unprocessed meat consumption (ibid). Large consumption of saturated fat, which is commonly found in processed meats, increase the risk of CVDs, especially along with high consumption of sugar and similar refined carbohydrates in the diet. Overall, the decrease in average saturated fat intake has a high probability of generating great health benefits in most countries (Boutron-Ruault et al, 2017).

One of the studies by Micha et al. (2012) showed that the consumption of the processed meat leads to a 42% increased risk of CHD while intake of unprocessed meat found 0 correlation. On the other hand, another study conducted in 2009 argues that there is insufficient evidence between meat consumption and CHD, stating that the risk increases in proportion to the quantity of meat consumed (Mente et al, 2009)

Research on the stroke types have discovered that the intake of both processed and unprocessed meat was associated with a higher risk of ischemic stroke (Boutron-Ruault et al, 2017). However, the risk of hemorrhagic stroke and red meat intake has been statistically insignificant (ibid). Finally, red meat intake has also been correlated with increase in hypertension based on the type of meat consumed (Boutron-Ruault et al, 2017). Overall, the relationships between meat consumption and CVD are only partly driven the meat intake (ibid)

‘The direct relationship between dairy products and risk of CVD is complicated because of the positive benefits of some of the components of dairy products such as calcium and the negative effects of others – particularly saturated fat and salt’ (D’Silva & Webster, 2017 p. 247).

3.2.2 Cancer

International Agency for Research on Cancer (IARC) state that the unprocessed meat consumption *could be* carcinogenic to humans while the consumption of processed meat is carcinogenic to humans (Bouvard et al., 2015). Similarly, World Cancer Research Fund (WCRF) describes the relationship between red and processed meat intake and colorectal cancer as ‘convincing’ (Boutron-Ruault et al, 2017). Processed red meat and the association between its intake and cancer is highly significant for colorectal cancer as well as for pancreatic and prostate cancer (ibid). Moreover, similarly to CVD & CHD, evidence suggest that processed meat increases the risk of colorectal cancer compared to unprocessed meat (D’Silva & Webster, 2017). WCRF and American Institute for Cancer Research (AICR) recommendations state that people who consume red meat should keep it to less or around 500 grams per week for unprocessed meat and little or no intake for processed meat (Boutron-Ruault et al, 2017).

3.2.3 Obesity and Diabetes.

Energy-dense foods such as meat and its by products in combination with energy density of the diet have direct impact on obesity (Rouhani et al, 2014). High intakes of processed meat result in a higher risk of obesity along with other food components often found in the Western diets. Furthermore, high meat consumption and weight gain consequently lead to the higher risk of developing diabetes (Doak and Popkin, 2017). For instance, it is estimated that chances of getting diabetes are significant with a weight gain of 5–8 kg for adults and the strength of the association is even higher as the weight gain goes up (ibid).

Studies that analyzed the relationship between type 2 diabetes (T2D) and red meat indicate that high volumes of processed meat, compared to unprocessed, increase the risk of developing T2D (Micha et al., 2012). These studies have also taken into consideration lifestyle habits and behaviors such as smoking, exercising, total energy consumption and so forth (ibid). Consequently, saturated fat (commonly found in animal foods) and trans-fatty acids (found in red meats) within the meat were one of the factors in development of T2D (Micha et al., 2012). People who followed a diet rich in meat and meat products have experienced increase in the quantity of iron in the body which led to damaged tissues, DNA as well as interference of glucose uptake which in return damages the insulin sensitivity (ibid). In other words, the high amounts of fat and iron present in red meat explains the positive association of diabetes compared to white meat

(Micha et al., 2012). Nevertheless, it is important to consider that studies have been conducted in the USA where processed meats had on average similar amounts of saturated fat and iron in comparison to unprocessed red meat (ibid). D'Silva & Webster (2017 p. 248) summarize the findings regarding obesity and diabetes:

'It is well known that obesity is increasing almost everywhere in the world with serious adverse health consequences including increasing rates of diabetes. Some have suggested that this is somehow associated with the high and increasing consumption of MDPs, particularly meat. However, there is little evidence for any direct relationship'

3.3 The impact of meat production on the environment

Measuring and debating how meat production is harmful to the environment compared to other types of food is a complicated question (Godfray et al, 2018). This is mainly due to the variety of meat production systems in developed and developing countries (ibid). As 1/7th of the world is undernourished while the other 1/7 suffer from "diseases of excess", farmers are unable to produce quality food in sustainable fashion (Tudge, 2017). Steinfeld & Gerber (2010) argue that the Livestock Revolution in developing countries is driven by rapidly growing incomes and technologies which combined cause global environmental impacts which soon will reach and exceed sustainability boundaries. The large amounts of cheap meat have flooded world markets and unless people are ready to pay more, the negative impacts of cost-effective livestock practices will continue damaging the resources of the planet (Tudge, 2017). It is argued that although farming should be productive, it should not be done without sacrificing its sustainability and resilience (ibid).

3.3.1 Livestock production & Greenhouse Gases (GHG)

One of the major ways of how the livestock production contributes to climate change is through deforestation that is done for the expansion of pasture lands and growing crops (UN FAO, 2009). Animal agriculture accounts for around 9 per cent of dioxide emissions caused by humans globally (ibid). In addition to that, the industry is a significant contributor to the GHG like methane which is 20 times stronger than carbon dioxide. It is estimated that the livestock is accountable for roughly 37 per cent of global methane emissions caused by humans (UN FAO, 2009). Meat production industries in developing countries are going through a large replacement of traditional farming (livestock growing and feeding in open fields and natural timing) with industrial agribusiness (mass and fast production of livestock on the limited spaces and with increasingly higher resources used: water, crops) (Tudge, 2017). Furthermore, red meat production and in particular beef, require higher amount of land, fertilizer and water resources compared to other

types of meat (Eshel et al, 2014). Currently beef production contributes to four times more greenhouse gases than calorie-equivalent pork and five times more than poultry (ibid). The production of plant-based products on the other hand, causes 3 to 5 times lower emissions compared to poultry and pork and even much lower compared to beef (Tudge, 2017; Godfray et al, 2018). Sustainability wise, it is efficient to feed a crop to humans rather than to animals which will be later consumed as well (ibid). Currently more than one third of crops in low- and middle-income countries (LMIC) are lost in harvest and in high income countries gets thrown away (Tudge, 2017). Nevertheless, the idea of increasing the food supply in order meet the demands of increasing population is considered as a fact for many governments and businesses (ibid). Livestock which is fed on crops not only causes significant environmental challenges but also competes with humans (Godfray et al, 2018). If the production trends remain the same by 2050, livestock will be consuming as much food as 4 billion people could (Tudge, 2017).

3.3.2 Livestock production & water use

Apart from GHG emissions, the sustainable use of water resources also remains a challenge (Tudge, 2017). To date, freshwater is heavily used for agriculture and about one third is allocated for the livestock (Godfray et al, 2018). The impact of water used largely depends on several factors such as source, season and location. In addition to that, the type of meat produced impacts the water footprint on different levels. For instance, beef production is three times more demanding than chicken production (ibid). Kazakhstan and Central Asia considered the region with highest probability of water conflict (Zhupankhan et al, 2016). The economy of the country is developing under the increasing water deficiency and although the country has developed pre-requisites for integrated water resources management (IWRM), the regional water integration is also required for the sustainable use of water resources (ibid).

3.3.3 Livestock production, biodiversity & land use

Another important aspect of agriculture and livestock production is the effects on biodiversity caused by the land conversion (Godfray et al, 2018). For instance, 71 per cent of rainforest land conversion has been completed for cattle ranching and 14 per cent for crop production such as soya to feed the animals (ibid). Nevertheless, some research show that livestock could contribute to better biodiversity in certain ecological settings where species are extinct (Godfray et al, 2018; Steinfeld & Gerber, 2010). However, due to increasing demands for food production, especially in LMIC, unsustainable overgrazing and further damage to biodiversity is rising daily (ibid). This often leads to another side effect of shared diseases such as the case of lions in South Africa which are in a high risk of being infected with bovine tuberculosis from the buffalo that in turn were infected by domestic livestock (Godfray et al, 2018).

To conclude the thought, Tudge (2017, p 14) states:

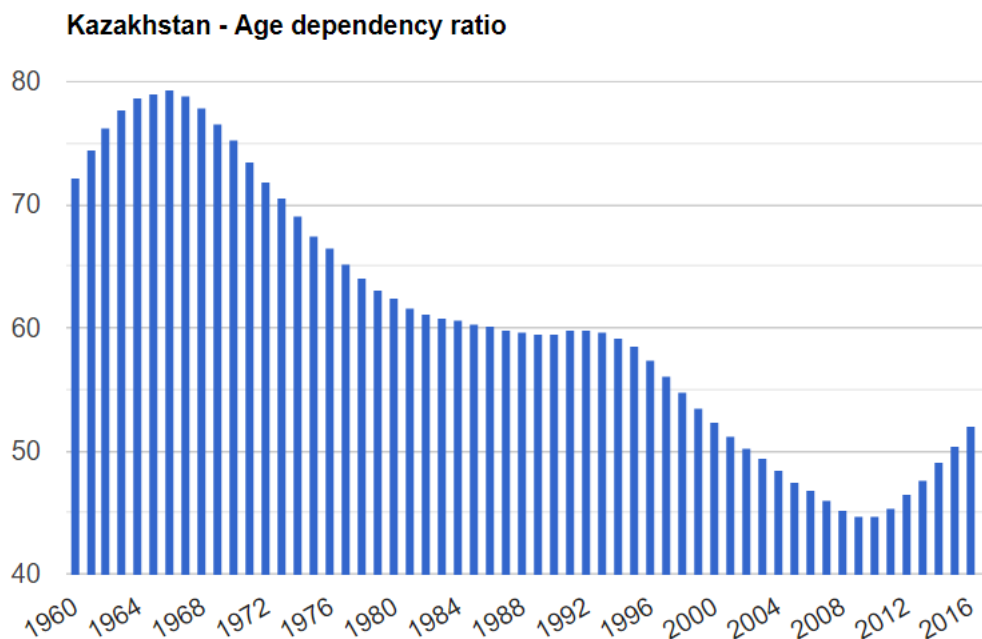
‘If all countries reinstalled the traditional structures, then almost all of them could be self-reliant – and without wrecking their own environments or the climate. Nowadays a billion people are hungry not because the world cannot produce enough food but because the food is not produced in the right places; crops are raised as commodities to be sold abroad for cash, rather than as food for the local population; and a huge amount is wasted’

4. Contextual overview of Kazakhstan

4.1 Demography & Health

Kazakhstan is the ninth largest country in the world with a population of around 18 million people (World Bank, 2019). The gender ratio is equal to 0.92 with slightly more females than males. Urban population consists of 57.4 per cent and most of that population living in Almaty (~ 1.8 million), Astana (~ 1 million) and Shymkent (~ 980.000). Overall, the census consists of the following ethnicities Kazakh (Qazaq) 63.1%, Russian 23.7%, Uzbek 2.9%, Ukrainian 2.1%, Uighur 1.4%, Tatar 1.3%, German 1.1%, other 4.4% (CIA, 2019). Age dependency ratio has been increasing from 44.6 per cent in 2010 and 53.6 per cent in 2017 meaning that the working population needs to support non-working groups, either young or old (figure 3) (The Global Economy, 2019).

Figure 3, Kazakhstan – Age dependency ratio (The Global Economy, 2019).



Kazakhstan has a high risk associated with dietary patterns, high systolic blood pressure and increasing body mass index (WHO, 2013). For example, in 2013, diabetes ranked as the fourth highest cause of years of life lived with disability. Obesity forecast indicates that 45% of men and 29% of women in Kazakhstan will be obese in 2020 and 74% of men and 36% of women in 2030 (ibid). Those risk factors have great socioeconomic consequences for the development of the country and require strengthening of the health system to respond to the growing burden of NCDs. WHO report from 2013 states that strategies to improve diets and physical activity are not effectively implemented as the population continues to consume processed food with a high

concentration of sugar and trans-fat. Moreover, there is an absence of regulation mechanisms of unhealthy foods to children and the promotion of active lifestyle among adults (WHO, 2013).

4.2 Culture and society

Kazakhstan is a country with high power distance where a person in a position of power (in professional and non-professional settings) is treated with respect and looked up to for advice and guidance (Nezhina & Ibrayeva, 2013). In social settings, citizens tend to patiently wait for authorities to solve a problem instead of advocating for change (ibid). One of the possible reasons is the sudden transition from the socialist non-democratic state to capitalist system (Nezhina & Ibrayeva, 2013). Furthermore, this change has also affected the culture by prioritizing more masculine values like competition over feminine value of sharing and protection (Dave, 2007). The economic transition has created high levels of uncertainty and anxiety among people as the country no longer aims nor promises to create the welfare state (ibid). Nevertheless, the past three decades of capitalism and promotion of individualistic values have not affected society significantly (Nezhina & Ibrayeva, 2013). Kazakhstan is considered being very low on the individualism scale and is classified as highly collectivistic society which means that people tend to approach issues by engaging several loyal members and extended family to solve them (ibid). Family ties and parents' approval are very important to over 90 per cent of people (World Value Survey, 2011). In addition to that, men are usually perceived as better executives, politicians and those who should have the jobs in times of hardships (World Value Survey, 2011). Finally, a bit more than 80 per cent of the women agree that being a housewife is just as fulfilling as working for pay (ibid).

4.3 Livestock production and eating habits

Historically, meat and dairy were the most important foods for Kazakhs (Albala, 2011). The livestock sector (mainly consisting of sheep, horse and camel) has existed from ancient times and the consumption of these type of meat has been culturally and historically the main component of almost all the meals among Nomadic Tribes of Kazakhstan (Kurmangaliyev et al, 2013). Preparing Kazakh food is quite labor-intensive. Although dishes tend to be composed of relatively few ingredients, meals are composed of multiple dishes, so a lot of chopping and mixing is required. In most households cooking is a female occupation, the responsibility of the senior woman in the house, aided by her daughters or daughters-in-law as required (Albala, 2011).

Although there has been a small decline in meat consumption due to economic crisis and growing prices in the country, the overall trend of meat consumption has remained positive in the past 6 years. Average consumption of meat per person has grown from 65.9 kg/year in 2011 to 72.9 kg/year in 2017. The most popular types of meat consumed were a) beef 23.8 kg/year b) lamb

6.32 kg/year and b) ground meat 6.08 kg/year (Rankings KZ, 2018). The largest city of Almaty has one of the highest meat consumptions per person accounting for 83.5 kg per year in 2017.

4.4 Media and the spread of information

To date, television remains the main source of information consumed by most of the country's population (Nikolayenko, 2015). Currently over 13 million people living in the country have access to the internet (Baidildayeva, 2018). According to the Kazakhstan Ministry of Communication and Information there are 1,357 newspapers, 48 radio stations, and 51 TV companies, however a large share of them is controlled by groups and individuals from the inner circle of the first President N. Nazarbayev (Nikolayenko, 2015). Moreover, Nazarbayev signed a bill that simplifies the process of blocking certain websites in the name of 'national security' (Baidildayeva, 2018). State propaganda aims to present Kazakhstan as a stable country free from conflicts and thus blocks any content challenging this status (ibid). Nevertheless, according to a Google Transparency report, the company received a high number of requests from the Kazakh authorities to remove the content related to alternative political views (Baidildayeva, 2018). Despite high rates of censorship, Junisbai et al (2015) argue that the media has high level of trust from people in Kazakhstan. Finally, Nikolayenko (2015) found that the internet-based media has a significant negative impact on youth's political trust and confidence implying that the impact of online media could be stronger in countries with high press freedom restrictions.

5. Methodology and Description of Data

5.1. Choice of methodology

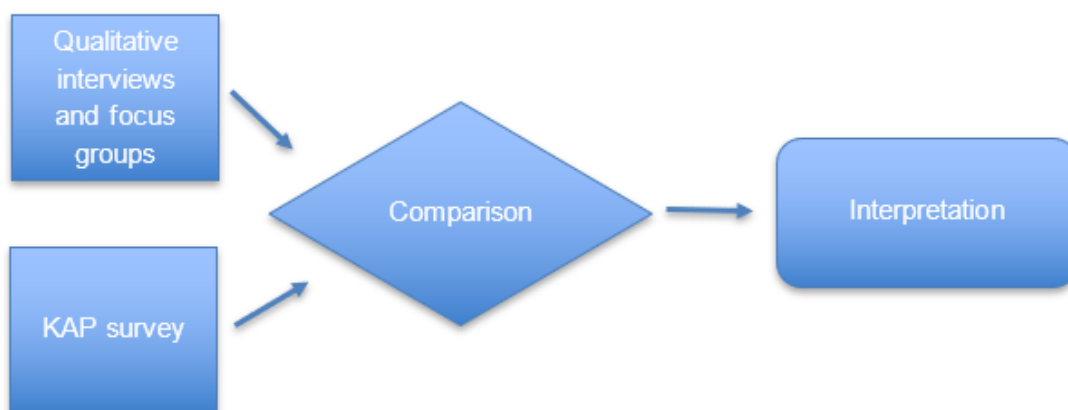
The study deploys mixed-methods approach which provides the researcher to work with 2 different kinds of data (Creswell 2014) and thus, enables to get a better understanding of the area that has not been researched before. While the quantitative data presents readers with *what?* type of information, qualitative data results complement and elaborate on *why?* (Creswell 2014).

Mixed methods go along with the analytical framework of KAP. While the individual characteristics such as knowledge, attitudes and practices are analyzed using quantitative approach, intrapersonal and community level characteristics such as social identity, culture, rules and norms are analyzed through interviews, focus groups and existing literature. When combined, both quantitative and qualitative data supplement each other in order to answer the research questions and objective.

5.2 Design

The design of the research is illustrated in the figure 4. Quantitative data provides the general overview of KAP of red meat consumption among young people in Almaty. The qualitative interviews and focus group enrich and give deeper meaning to the results.

Figure 4, Design of the mixed method study (researcher's own construct based on Creswell, 2014)



The study used convergent parallel mixed method meaning that both quantitative and qualitative data are collected and analyzed nearly around the same time (figure 4). These results and findings are further compared, compiled and interpreted in relation to the existing research and analytical framework.

5.3 Description of Qualitative Data and Sampling Strategies

The study uses 2 main types of qualitative data collection which are semi-structured interviews and focus group interviews (Bryman, 2012). The interview questions were split into 3 main themes based on KAP and provided the possibility to extract in-depth knowledge about the research topic (Creswell, 2009).

The sampling strategy for individual interviews was purposive and non-random (Bryman, 2012). The participants for face to face interviews were representatives from three sectors: public health, private meat retail and private vegetarian products retail. This strategic sample and interviews provided first insights on existing knowledge, behaviors and attitudes towards red meat among general population of Almaty and the information was used to further enhance the design of KAP survey (Silverman, 2013). Public sector officer as well as the owner of the vegetarian store were contacted using publicly available contact details while two of the three meat retailer contacts were acquired through the snowball sampling meaning the initially chosen retailer suggested other participants for the study (Bryman, 2012).

The sampling strategy for focus group with vegan/vegetarians, young meat consumers and older generation was based on both the non-random convenience and snowball sampling where the researcher first used her existing network to reach the initial participants that agreed to take part in the research (Bryman, 2012). Consequently, these participants were asked to nominate further subjects known to them, so the sample increases to 4 participants per focus group (Bryman, 2012).

Older generation participants were interviewed in order to compare the existing KAP trends towards red meat between the generations and to see to what degree these characteristics are transferred and acquired by the target (young) generation. Vegan/vegetarian focus group were interviewed in order to examine the differences in KAP and what differences specifically reduce the barriers to switching and following plant-based diet for young people.

All the interviews and focus group were conducted in Russian without a translator due to the researcher's fluency in the language which ensures additional data trustworthiness (Bryman, 2012). Finally, Table 1 below summarizes the number of participants and the duration of each individual and focus group interviews.

Table 1: List of Participants (researcher's own construct)

Interview participants	Focus group participants
CEO of the first vegan/vegetarian store in the city ~40 minutes	Vegan/vegetarians (4 participants aged below 30) ~1 hour
Head of Public Health Promotion in Almaty ~ 30 minutes	Young generation of people from Almaty (4 participants average age 21) ~40 minutes
3 owners of small meat stores in Almaty ~20 minutes each	Older generation of people from Almaty (4 participants with average age 55) ~40 minutes

All the interviews are recorded except for the one with public health official, however the notes with responses and on behavior of the participants are taken from all the engagements. As recommended by Bryman (2012), interviews were analyzed and scripted as soon as possible in order to spot certain trends and reflect on the possible questions for the next interaction. This is also done with the support of NVivo. Key quotes and thoughts are presented in the analysis and discussion chapter of the thesis.

5.4 Description of Quantitative Data and Sampling Strategies

The quantitative data was collected and analyzed by designing and conducting KAP survey. The KAP survey can be used to study the target population and is designed to explore what is believed, known and done in relation to the topic (WHO, 2008). This research aims to find common patterns in attitudes towards red meat consumption, knowledge regarding its quality and health effects and finally everyday practices and future consumption trends among young people in Almaty. Thus, the survey was designed based on 3 main modules with an additional block regarding background information. The questionnaire consists of around 30 close-ended questions and is expected to be completed in around 5-10 minutes both with the interviewer and/or independently. WHO (2008) argues that KAP surveys assist in identify knowledge gaps, cultural beliefs, or behavioral patterns and therefore able to facilitate better understanding of the topic.

As the population of Almaty soon exceeds 2 million people and has diverse demographic characteristics the survey is focused on young people aged 18-30 of any ethnic and socio-economic background. This is done due to 2 main reasons: first, young people can complete the survey online and further spread it across their network resulting in a higher participants number. Secondly, the split based on cultural background and socio-economic origins would require longer time to collect the responses and the study runs under the assumption that the eating habits within the country and the city are similar among all the population.

While randomly selected samples are important because they permit generalizations to the population, due to the limited time and financial resources this research follows non-probability sampling (Bryman, 2012). In this study snowball sampling is deployed to collect quantitative data meaning that the researcher first establishes contact with a small group of people and provides them with the survey which later spreads out on the basis of links to the initial contacts (ibid). The survey responses were collected both offline and online from the mid December 2018 until the end of February 2019. The total of 246 responses were collected with a slightly higher female participants compared to male (70 per cent & 30 per cent respectively). Though any question could be left unanswered, all the participants provided responses to all of the survey questions. The research uses descriptive statistics meaning that the data is summarized, and patterns are presented in percentages, range and frequencies (Bryman, 2012). Further quantitative limitations and considerations are outlined in the following section of the research.

5.5 Methodological limitations

It is important to acknowledge that all studies have limitations. One of the first limitations is the existing argument against mixed methods research (Bryman, 2012). In other words, mixed methods are considered by some researchers as non-feasible and each belong to separate paradigms of values, assumptions and methods which are incompatible (ibid). Nevertheless, this limitation was addressed by stating the rationale behind this method and the study objective as well as providing full details and information about the sampling, design and analysis of the data for both components.

Secondly, the next limitation that is important to acknowledge throughout the whole study and data analysis is the high likelihood of non-representative population which occurs when non-probability sampling is used. This sampling technique does not select subjects from the target population in a mathematically random way (Bryman, 2012). This in turn means that non - random samples usually produce samples that are not representative of the population as the whole (e.g city or country) and thus the ability to generalize the findings based on them is limited (ibid). Often, the findings can be generalized only to the population from which that sample was taken

(e.g young people from a specific university or district), however the researcher is unable to track majority of the responses which occurred with the assistance of snowball technique. Although the findings and conclusion are presented from the generalized perspective of the young people from Almaty, the author is aware of this limitation and acknowledges it.

Thirdly, due to the geographical and thematic choice, the absence of similar previous research has been another limitation. The study is largely based on literature review from the Western contexts and is assumed to be somewhat applicable in the context of Kazakhstan. The study follows an assumption that environmental impact from the livestock production has not yet exceeded the sustainability thresholds in the country.

Finally, due to my background of being born and raised in Almaty I am subject to cultural bias which also could limit the way the results are presented. For instance, during the analysis stage I took some of the findings as common knowledge although the session with my supervisor showed me that this is not always a case. In order to address this limitation, all the findings were discussed in detail with the supervisor and thesis group mates in order to make sure important aspects are not missing.

5.6 Reliability, Validity & Trustworthiness of Data

The measurement of the validity and reliability is done in order to enhance the quality of the studies (Bryman, 2012). Validity tackles the issue of designing indicators which gauge a concept to really measure it. In relation to this research, validity is making sure that the KAP survey does indeed measure these 3 indicators. The study has followed WHO guide on creating KAP surveys and analyzed possible limitations of the tool. Furthermore, reliability refers to the consistency of a measure (Bryman, 2012). In other words, how consistent are the results of a participant if a survey is administered again over time. Reliability was pre-tested and confirmed by having 3 respondents from the researcher's social circle to complete the survey with one-week interval.

5.7 Ethical considerations

The research has been carried in accordance with LUMID ethical guidelines. Participants of the survey were provided with the research purpose, anonymity and possibility to withdraw from the participation at any time. KAP survey does not require email sign up however, for the promotion reasons, respondents could provide their email address if they wished to receive a discount at the vegetarian store.

All the interviews and focus group interview participants were aware and agreed to have their answers recorded. The only exception was the visit to the public health officer as the country

adopted the “no phones” policy in government agencies and thus the recording of the interview was declined, however the note taking was allowed.

Another ethical consideration was regarding my positionality as the researcher. Since the topic is relatively non-sensitive, many interview participants and offline survey respondents have displayed some skepticism and confusion about the purpose of the research. Some of them asked me if the intention of the interaction was to convert them into the vegetarian lifestyle.

All the interview participants were provided with the consent form that ensures privacy and anonymity and a right to withdraw from the study at any given moment. The interviews were conducted in comfortable settings that suited the participants the most. The final copy of the study will be shared with all the participants who have indicated their interest.

6 Results

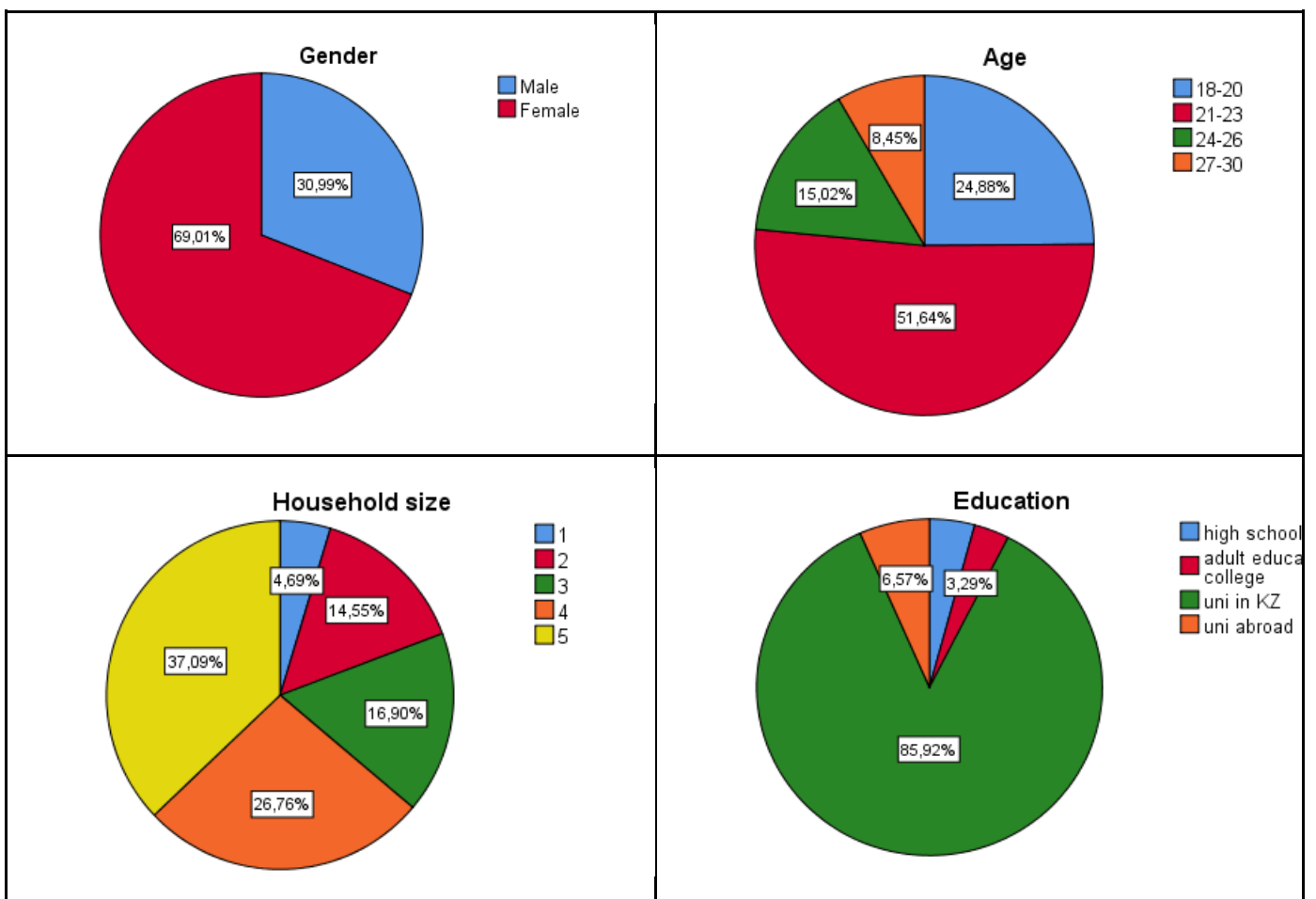
Quantitative Data findings

The following section presents a quantitative data overview from the KAP survey. It provides a socio- economic profile of the respondents and detailed data derived from the three key factors focused on in the study: knowledge, attitudes and perception towards red meat consumption.

6.1 Socio-economic Profile of the respondents

The total size of this study is 246 people with 213 meat consumers falling under the targeted 18-30 age bracket. Out of total 213 respondents, 66 (~31 per cent) are males and 147 (69 per cent) females. Around fifty per cent of the respondents are between the age of 21-23. The average size of the household is 3.7 people and with eighty-three per cent of the respondents indicating that they are single. Finally, over 90 per cent of the respondents have or are receiving university degree in Kazakhstan (85.9 per cent) or abroad (6,5 per cent).

Table 2: Background information of KAP respondents (researcher’s own construct)



6.2 Existing knowledge about red meat consumption

Health

The general trend in the knowledge section is that very few people are aware about the positive relationship between red meat consumption and health conditions. Around half of the respondents say that they do not know if the link between the two exists and at least 20 to 30 per cent deny that red meat intake causes diseases like heart attack, diabetes and so on. The highest disagreement rate is regarding obesity where 38.5 per cent believe that meat consumption does not contribute to it. The lowest agreement rate is regarding diabetes where only 14.1 per cent agree it could be caused from red meat intake.

Table 3: Knowledge about the Health outcomes (researcher's own construct)

<i>Relationship between high intake of red meat and</i>	Agree	Disagree	Don't know
1. Obesity	18.8	38.5	43.5
2. Diabetes	14.1	36.2	49.8
3. Cancer	28.2	26.3	45.5
4. Hypertension	32.9	19.2	47.9
5. Heart attack	35.2	21.1	43.7

Environment

There is generally slighter higher awareness about red meat production and its impact on the environment. About the third of respondents agree that there is a relationship between livestock production, greenhouse gas emissions and freshwater withdrawals. Nevertheless, nearly 43 per cent of people believe that livestock production has no impact on water and air pollution. The majority chose "don't know" as the most common answer in the environment section.

Table 4: Knowledge about the Environmental outcomes (researcher's own construct)

<i>Relationship between livestock production and</i>	Agree	Disagree	Don't know
1. Greenhouse emission	36.6	25.4	38
2. Freshwater withdrawals	38	23.5	38
3. Air and water pollution	36.6	43.2	20.2

6.3 Existing attitudes towards a meat-based diet

Most of the people first pay attention to the physical features of the meat when they buy it (color, smell, taste). Then about 15 per cent pay attention to the origins and producer. The vast majority (nearly 80 per cent) agree that eating meat is enjoyable and that it is nutritionally necessary for humans. Only 2 per cent disagree that meat eating is a big part of Kazakhstani culture.

The overall attitude towards a plant-based diet is quite neutral as only less than 10 per cent believe it is not as healthy as the diet based on the red meat. Nevertheless, one third states that vegetarian or plant-based diet is quite expensive. The major reason for shifting towards plant-based diet would be health related conditions (60 per cent) though some 20 percent say that they would never give up meeting meat.

More than a half of the participants say that they have a vegetarian/vegan friend or a family member. Only 6.6 per cent would try to change the minds of their family members if they chose to be vegetarians/vegans compared to 80 per cent who would accept that choice. Finally, around 13.1 per cent say that they dislike plant-based foods. The rest of the majority finds it as delicious, however only 1/3 find it as filling as the meat-based meal (All the graphs from this section can be found in appendix B).

6.4 Existing practices towards red meat consumption

Half of the participants eat meat products at least 5-7 days a week and the other half at least one to four days a week. Unprocessed meat is consumed by roughly 50 per cent almost daily compared to 35 per cent who eat processed meat daily. Street markets, farms and specialized meat stores are the most common places to purchase meat from with supermarkets only being used by 8.5 per cent of the population. The most consumed meat types are equally split between boiled, fried and stewed. In the past 3 years, a quarter of respondents indicate the increase in the meat consumed per household, while 60 per cent consume the same amounts as before. Of those, who have increased the consumption amount, state that the main driver is the increase in individual demands, followed by increase in income (All the graphs from this section can be found in appendix B).

7. Analysis & Discussion

7.1 High confidence in meat but low knowledge about the health and environmental impacts

For many young people in Almaty, meat is still considered as a ‘vital source’ of nutrients required for their health as 75 per cent of survey respondents agree that meat is an important component for humans. Indeed, (Wyness et al, 2011) states that high quality proteins, iron, zinc and a range of vitamin B are mostly found in red meat. In addition to that, red meat is considered as a source of the nine indispensable amino acids for humans (ibid). Older generations agree that although eating meat-free dishes can be good, having at least some kind of meat is essential for health. One of the respondents provided an example of a friend whose daughter has become vegan:

I have friends whose daughter became vegetarian and this young girl is so hungry all the time, so she eats a lot. She needs calories from the meat, at least chicken, you need to have it in your diet, and you feel much better

Similarly, in an interview with a public health officer of Almaty the following was the explanation:

Our ancestors have always eaten meat and lived quite long, our meat tolerance depends on our enzyme system and throughout the time our bodies have developed high meat acceptance, if you look at your Russian [Slavic] friends, you can notice they have high alcohol tolerance and do not get drunk as fast as we do, this is again all due to the enzyme system

Researchers argue, that any diet, including plant-based diet, needs both good planning and consistency (Craig & Mangels, 2009). Well-thought vegetarian diets are suited for all individuals at any stage of life such as childhood, adolescence, pregnancy as well as athletes. Nutrition specialists should also play a key role in educating vegetarians and non-vegetarians about the food preparation, personal modifications and sources of nutrients (ibid).

According to the Ministry of Health of the Republic of Kazakhstan, an adult should on average consume 20% of protein per meal a day in order to stay healthy (Ministry of Health of RK, 2019). Nevertheless, the survey results show that young people have little awareness about the recommended nutritional guidelines when it comes to the meat (protein) intake. A bit more than 22% per cent think that 20% is the recommended proportion while around 47% per cent think it should be around 30-40 %.

Furthermore, apart from quantity, quality of the meat is also a major factor in affecting our health (Godfray et al, 2018). A large study has shown that people who ate one portion of unprocessed red meat (beef, lamb) a day had less risks of getting a heart disease and diabetes than those who ate processed meat (Micha et al, 2012). The focus group interview with older generation of meat eaters

shows that the participants were more aware of the health-related consequences of their meat consumption compared to the focus group interview with younger generation. When asked about the possible health effects of red meat consumption one of the participants said:

It depends on the quality and quantity, small portions 2-3 times a week balanced with vegetables is good for health. On the other hand, we don't know where the meat comes from sometimes nowadays, you read news and see frozen meat or chicken having more antibiotics, water and other things to make it look good

Consequently, focus group interview with the target population reveals that young people on the other hand, do not usually think about the relationship between the two variables. 'I do not know for sure because I never really think about this' - said one of the respondents during the interview, followed by similar replies from the rest of the group.

Research show that the awareness of health-related impacts is usually much higher about the vegetarians, especially health-motivated vegetarians (HMV) (Dinu et al, 2017). HMV consider meat consumption as an unhealthy behavior rather than ethical crime (Rosenfeld & Burrow, 2017). However, morally motivated vegetarians whose main motivation is based on ethical principles perceive health-motivated vegetarians as self-centered and concerned only about personal health needs (ibid). Nevertheless, the KAP survey and interviews showed that the main reason one would turn or is a vegetarian are health-related concerns. A target group interview participant notes:

The only reason I would stop eating meat is if I had some serious health problems, otherwise I see no point

Unsurprisingly, vegetarian FGD & the vegetarian store founder were highly aware of the health consequences that the red meat intake causes. Most of the visitors of the vegetarian store have switched to non-animal-based products due to the health-related reasons similarly, the vegetarians have chosen to stop eating meat as they have learned its adverse effect on human's health and wish to remain healthier longer. When describing the benefits and motivation of why one became vegetarian, they stated:

I do not have stomach related problems anymore and feel much more energetic, my skin has become much better and so did my hair

and

I like that I can eat and not get fat, I used to have problems gaining and losing weight when I ate meat and could have both anorexia and bulimia

Tuso et al (2013) state that plant-based diets are indeed highly effective for weight loss. In addition to that, vegetarian lifestyle decreases the risk of CVD, high blood pressure, diabetes, and obesity

(ibid). Furthermore, vegan diet causes faster calories burn in contrast to non-vegan diet where food is being stored as fat (Tuso et al, 2013). Overall, the nutritional guidelines recommend plant-based diet based on whole, plant-based foods and discourages dairy and meats, especially processed ones (ibid). As mentioned in literature review, processed red meats have significantly higher adverse health effects on human body compared to unprocessed meats (Boutron-Ruault et al, 2017).

Primary data analysis of qualitative interviews shows that although older generation has better awareness about the differences between unprocessed and processed meat health effects, both generations agree that fast food or street food have negative impact on the wellbeing. One of the interviewees states:

When I watch American TV series, people who eat a lot of fast food have heart related problems and they have to switch to meat-free diets, so I guess fast food is bad for heart and also a lot of people are obese in the USA

Laranjo (2016) talks about how media and social media in particular can impact the change in health behavior. Social media interventions can be beneficial due to age, geography and interests filters (Laranjo, 2016). The growth in social networks creates opportunities for spreading public health information for better health behaviors, especially among young people (ibid). As mentioned in contextual overview of the country, the media outlets and access to certain websites is controlled by the government and although this contradicts the idea of free press and human rights, the information can be spread and absorbed quite quickly among the population (Nikolayenko, 2015). Nevertheless, this requires public officials that recognize the benefits of plant-based diet. Further, during the interview with public health officer of Almaty, the answers were based on the idea that meat consumption is essential for our health and instead of plant-based diet, young people should know the difference between good quality and bad quality meat:

It is important to be able to tell what kind of meat is good for health and what kind is bad, yes the meat is now less ecological and is produced by Western technologies, but one can tell by the producer, stiffness and color whether it is to be consume or not.

When it comes to the environment, both survey and interviews indicate low overall awareness on the impacts of livestock production has on air, water and climate. Roughly 35% of respondents agree that the relationships between red meat production and environmental change exist. Three of the focus group participants stated that they have no idea if livestock production affects environment in any of the ways. Nevertheless, only one of the respondents stated:

Yes, livestock production affects ozone layers I think. Did you guys know that the gas produced by cows has the most impact on the ozone layers? Also they use a lot of water on the animals and pollute the environment I remember we studied this in Ecology class

A recent study argues that the majority of people tend to underestimate the actual impact their dietary choices have on the climate (Camilleri & et al, 2018). The main reason to the underestimation is low awareness of how different kinds of food impact the environment (ibid). According to the latest government report, 99 per cent of meat production facilities are considered as small enterprises employing less than 50 people (ARG Group, 2017). During the interviews, many state that they prefer to purchase meat from farmers and their direct suppliers rather than supermarkets. Similarly, three of the meat retailer shop owners claimed that they purchase meat directly from the farmers, mostly based on the previous contact with them. When asked about the reason behind the supply choice one of the participants commented:

They are farmers with small amount of livestock around 20-30 quality bulls. They use only the basic antibiotics to prevent disease but not for muscle growing. Finally, they slaughter the animals correctly, by the halal principles.

Halal meat is obtained by slaughtering species using the halal method of killing an animal through a cut to the jugular vein and blood drain (Nakyinsige et al, 2012). Muslim consumers worldwide are becoming more concerned about the kind of meat they consume fearing pork substitutes, prohibited food ingredients and non-halal methods of slaughter (ibid). Similar trend is present in Almaty, however none of the respondents raised environmental concerns during the interview. Therefore, when combining the traditional ways of livestock production that is prevalent in Kazakhstan and no concern for environmental impacts among consumers, it is assumed that ecological impacts of meat processing in the country is not at critical level yet.

Nevertheless, the study does not investigate detailed environmental impact caused by meat manufacturing, however it is assumed that it will grow over time. Currently, large agriculture enterprise account only for 8% of total cattle produced in the country (ARG Group, 2017). Nevertheless, the government has set the plans to increase meat processing power by building large facilities with larger volumes and exporting potential (Atameken, 2018). Further study is suggested at this point.

7.2 Cultural attitudes, food traditions and exclusion

One of the most commonly mentioned reason as to why people eat meat among the respondents links to “the culture”. In fact, 85% of survey respondents agree that meat-based dishes are a big part of their identity. Pohjolainen et al (2015 p. 1152) believes that:

‘Peoples’ dietary choices are shaped by cultural-specific meal structures and food consumption etiquettes, which are typically very persistent and define what types of foods are considered acceptable and appropriate’

Edwards (2013) argues that questioning traditional food choices is a challenging thing to do. Since hospitality is an essential part of Kazakh life it is often accompanied by frequent family and social gatherings and high food amounts (Albala, 2011). According to the old traditions, all gatherings must include “Dastarkhan”, a big table where food is laid out (figure 5)

Figure 5, “Dastarkhan” (Kazinform, 2016)



Dastarkhan symbolizes the importance of sharing generous hospitality with family, friends, and guests (Albala, 2011). According to the nomadic tradition, the central meal is based on meat (typically a sheep) and is then split among guests (Albala, 2011).

These traditions are still prevalent in modern times and are one of the major barriers towards switching to the plant-based diet. Focus group interview responses show that, although both

generations have neutral attitude towards vegetarian food, it is not commonly consumed. Half of the respondents report eating meat at least 5-6 times a week and only 11% per cent eating it less than once a week. Moreover, all interview participants stated that vegetarian food is not a popular option when eating out or during social and family gatherings. One of the thoughts regarding meat-based dishes was:

Have you guys not had it in childhood when your parents insist on you at least eating the meat pieces from the dish?

When parents or relatives are the food providers, the change to the plant based or vegetarian diet becomes especially challenging (Edwards 2013). During the focus group interview with vegetarians one of the respondents recalled:

I remember when I was younger and visited my village, I refused to eat meat-based foods and people would go mad saying how am I not ashamed of such behavior

Since vegetarians and vegans represent a unique kind of minority group, they are often surrounded by the dominant non-vegetarian group eating a different meal or a meal by yourself can result in a sense of loneliness (Edwards, 2013). Research raises the link between hospitality and food emphasizing that giving, receiving and sharing food is a symbol of the bond of trust which puts a lot of value around a simple meal (ibid). Thus, vegetarians are found constantly adjusting and labeling themselves differently depending on factors such as social approval of vegetarianism or the presence of other vegetarians (Rosenfeld & Burrow, 2017). For instance, one of the vegetarian FGD participants says:

My dad is always trying to change my mind and we argued over this topic for a long time to the point where we no longer talk about it, I eat fish sometimes just to show him I eat some meat.

Both the vegetarian FGD and the vegetarian store owner believe that people in Kazakhstan do not usually question their existing food habits and tend to articulate with a common argument that “meat is protein therefore it is good for the body”. This is also true from an evolutionary perspective, where high-quality proteins from eating meat has been a key attribute to giving humans a larger brain (Smil, 2013). Thus, homo sapiens as a species have had a natural preference for meat and hunting, butchering and sharing meat has contributed to the evolution of our intelligence and development of planning, cooperation and socializing skills (ibid). Recently though several studies and nutritional recommendations indicate that it is not the source of protein that makes a significant difference on our health but rather the amount of protein that we consume, and this can be sourced either from plants or animal sources (Craig & Mangels, 2009; Tusso et al,

2013). In other words, humans around the world are biologically able to survive without red meat, as long as it is replaced with proteins from other high-quality protein sources, such as beans, nuts or poultry or fish. Moreover, new research is showing that reducing red meat consumption also has a positive effect on health by reducing both risks of premature death and prevalence of NCD (Harvard School of Public Health, 2019). As the result, plant-based diet is being more adopted and recognized both among nutritionists and people around the world (Tuso et al, 2013; Rosenfeld & Burrow 2017)

Based on the findings above, FGD of older generation were asked about their opinion on the increasing trend of vegetarian lifestyle and one of the respondents says:

My friend became a vegetarian and felt bad for some time until doctor told him that he should include meat back into his diet. We have a specific harsh climate in Kazakhstan and meat has some ingredients that you cannot find in other products.

Notably, others describe the trend in relation to other cultures without mentioning its relation to Kazakh culture. Gaspar et al (2015) explains that the main reason why many hesitate to challenge existing attitudes towards red meat is the psychological tendency to avoid information that contradicts existing beliefs and knowledge. Avoidance of information is one of the factors that influences people's motivation to look for risk information. Individuals choose to not learn about the information that will initiate uncomfortable or contradicting thoughts in their minds (ibid). FGD show that only one of the participants is aware of adverse effects of meat consumption on the environment, the reason being taking a course in Ecology:

I feel like generally people are not unaware about how livestock production affects the environment and the only reason I learned about this I because I had to study the material for my class.

Another common thought that arises during the interviews in relation to culture is the link between meat and masculinity. In particular, it is widely assumed that men are entitled to meat as one of the older generation participants says

Our mentality is built around eating meat-based dishes which are considered a joke otherwise, especially for men.

Calvert (2014) argues that meat-eating is a common trait of a patriarchal society where masculinity and normalization of aggressive behaviors is celebrated. Meat is not simply the central component of a meal but is also an expression of privilege (ibid). Indeed, according to Kazakh cultures, the sheep meat for example, is always shared according to the social status where males, particularly older ones, get the most delicious parts such as fillets while women, especially younger ones, are

given inner organs such as the heart and the liver to eat (Albala, 2011). During a FGD one of the male participants states:

I think we (as Kazakhs) are just born to eat meat.

Sobal (2005) argues that animal flesh and the process of eating meat is an expression of maleness. He further argues that: ‘Men sometimes fetishize meat, claiming that a meal is not a “real” meal without meat’ (Sobal 2005, p 138). In addition to that, cooking rituals and competitions are also dominated by men (ibid). Similarly, in Central Asian culture, killing a sheep and cooking a popular meat-based dish ‘plov’ is almost always performed by men (Albala, 2011)

7.3 Everyday practices and routines of meat-based diet vs plant-based diet

From the vegetarian perspective and experience, people they interact with often do not have a good overview of what a plant-based diet is and how does one follow it. Edwards (2013) argues that in heavy meat cultures, vegans and vegetarians are a minority group which is often misunderstood by non-vegetarians. One of the respondents says that many people cannot distinguish between vegan and vegetarian concepts. Moreover, vegetarians have troubles communicating and explaining the benefits of such diet as they are often met with jokes and sarcasm.

I remember going to some food place and asked them if they had anything vegetarian and they first brought me chicken and then offered sausages because we have a joke that they are made of paper anyway

Moreover, there is a common believe that vegetarians are socially and politically opinionated and are actively attempting to change the dominant meat-eating culture (Edwards, 2013 p 121). The FGD focus group interview with young meat eaters show that there is little understanding and recognition of those who follow a plant- based diet:

I feel like vegetarians are just showing off and use it as a trend to get recognition rather than to do it for sustainability purposes, or at least I have this image. I have a lot of friends, but I don’t have vegetarians in my circle.

However, many vegetarians choose to simply live their day to day lives and do not feel the urge to change every person they meet. One of the interviewee states:

People think I want to change their mind and convert them into salad eaters while I was just explaining myself because they asked me why I became a vegetarian

Greenebaum (2012) believes that vegetarians and vegans always need to improve their “face-saving” strategies as they often answer similar questions to new circle of people. One of the

strategies that the research finds effective is focusing and emphasizing health-benefits due to the fact that many people are fundamentally selfish (Greenebaum, 2012). Nevertheless, the respondents in the study stated focus group of vegetarian report that this technique is not very successful in influencing or changing people's food choices but rather have others to stop asking stereotypical questions:

I always tell people things like 'Do you know how many people die from stomach cancer due to high meat intakes?' and then everyone just tells me 'ok ok ok stop, we get it' and the topics are switched immediately

Furthermore, consumption routines and social settings are the main reasons why people are not willing to make any changes to the existing diets (Pohjolainen et al, 2015). As majority of the families build eating routines around meat, being consistent with vegetarian lifestyle is a big challenge (ibid). Becoming an independent adult and moving to another place makes food cooking and planning routines much easier:

When you live alone and no longer forced to eat meat you start asking yourself, do I really want to do it and slowly become aware of your own food preferences

Nevertheless, living independently does not solve the problem of eating out for vegetarians as they report little variety of vegetarian/green food available at the restaurants or cafes. Unavailability often forces them to plan beforehand by either looking up the menu of a place or bringing own food. Moreover, due to low demand on animal-free products the costs of alternative goods at specialized stores are quite high. For instance, a pack of regular milk costs around 0.5 USD per liter, while vegan milk costs almost 4 USD per liter (Informburo.kz, 2018; Green Bean, 2019). Thus, financial barrier is also present among young generation as one of the participants says:

I have seen vegetarian stores on Instagram, and they have insanely costly products and I would rather die from a heart attack than spend my money on those things

The owner of the store explains the price in accordance with low demand and importing fees of majority of the products as they are not produced locally:

Fast snacks and fast expiration date products made here and account for 20 % of what we sell. Otherwise cocos milk is exported from Indonesia, almond milk is from Russia and etc. We don't really produce that here because we do not have enough consumers to cover the costs

Furthermore, the interview discovers that most of the customers are females aged 25-40 who have disposable income to afford the products. Rosenfeld & Burrow (2017) state that women represent a significantly higher proportion of vegetarian population due to the masculine associations with

meat in many of the cultures. Nevertheless, in addition to gender, other factors such as religion and social class can also be the reasons behind vegetarian identity (ibid). The store owner adds:

Some people assume that we probably don't have (ethnically) Kazakh people coming and shopping, but our experience shows that is not true and that they very much come and shop but again, it is mostly Kazakh girls who don't eat meat.

Rosenfeld & Burrow (2017, p. 85) provide a brief description of vegetarianism:

'Vegetarianism exemplifies a food-choice pattern that typically involves sets of goals, either internally or externally focused requiring individuals to draw upon certain motivation that supports the achievement of those goals' (Rosenfeld & Burrow, 2017 p. 85).

Vegetarians/vegans generally have 3 main motivations of why they choose to follow plant-based diet which are prosocial, personal and moral (Rosenfeld & Burrow, 2017). Personal motivation, or a desire to benefit oneself is often found to be prevalent among vegetarians meaning that concern for personal health and well-being come before the prosocial motivation which refers to behavior aimed at benefiting the environment (Ruby & Heine, 2011).

Indeed, according to the survey results, the major reason why a person could potentially switch to vegetarian lifestyle would be health reasons (60.5%) putting personal motivation as the number one cue to action. The second reason was moral, where 7.6% indicated their possible motivation to be in favor of protecting animal rights. Only 3.8% per cent consider environmental impact and climate change as the main motivation to switch to plant-based diet. Finally, almost 20% per cent claim that none of the reasons would ever make them go vegan/vegetarian. Focus group interviews with both generations also confirmed that health related reasons would be the main motivation. One of the young participants said:

If I had to stay away from meat due to serious illness I could definitely do it. I do feel pity for animals, but I also feel pity for many other things

Rosenfeld & Burrow (2017) note that the majority of people transition to vegetarian lifestyle later in life as only very few vegetarians were introduced to the diet since birth. The switch creates unique relationships between food choices and self-concept and vegetarians perceive their past food choices unaligned with current ideological beliefs (ibid).

I read studies which show that people become more emotionally empathetic when they switch to plant-based diet

Indeed, a neuroscientific study by Filippi et al (2012) confirms that vegetarians and vegans have higher empathy levels when dietary choices were followed due to ethical beliefs. The research was also the first evidence of how dietary habits affect brain circuits (ibid).

Rosenfeld & Burrow (2017) believe that despite the main motivation, the transition to plant-based diet has the highest likelihood of success when a person sticks to gradual dietary adoption compared to abrupt dietary adoption. In other words, the transition should be approached strategically and with awareness of possible challenges and ways to address them. An FGD participant shares her experience:

I first became vegetarian when I lived in Canada, I remember eating my last 'olivye' (a popular meat-based salad) before the New Year's Eve. Then after a year I have noticed good changes and slowly switched to vegan diet, I am soon planning to switch to a full raw vegan lifestyle.

Although many survey participants find vegetarian diet tasty, they fail to provide them a better taste and feeling of fullness like meat-based dishes do. Almost 80% of respondents think that eating meat is enjoyable and one of the interview respondents says:

I can eat a vegetarian dish if I am offered one but why should I spend money on the food that does not make me full? I think I have a barrier or a block and think that that vegetarian food is not nutritional enough

Pohjolainen et al (2015) found that meat enjoyment due to the product appreciation is one of the important barriers to following a plant-based diet. The barrier is based on the familiarity in cooking routines as well as perceived nutritional necessity of meat (ibid). Many popular meat-based dishes are easily accessible and in growing demand outside (at restaurants, street vendors, fast food spots) (WHO, 2019). As more people choose to eat out in Almaty, these foods found to contain one of the highest levels of foods high in saturated fat (HFSS)(WHO, 2019). Meanwhile, Kazakhstan has no specific measures to restrict advertising of HFSS (ibid). Normalizing and promoting vegetarian or plant-based diets could be a potential solution and therefore a potential topic for further research.

7.4 Perceived barriers from the regional perspective & in the context of SDGs

Coming from the global perspective and the impact that Kazakhstan potentially has on the climate change could be perceived as insignificant when considering the vast size of the country and its proportion to the population (~18 million). The adverse effects of livestock production on the environment is difficult to estimate since the country has been historically raising large amounts of cattle and continues to supply it to the internal market with only little assistance from large meat production facilities (ARG Group, 2017). Nevertheless, the sustainability challenge becomes more significant if considered from the whole Central Asian perspective.

Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan and Tajikistan are post-soviet countries with shared cultural values and languages which combined all together represent the population of almost 72 million people (World Bank, 2019). Unresolved climate change consequences from the post-soviet era may cause significant long-term economic costs since the majority countries in the region still rely on agriculture (ibid). Furthermore, the countries share similar food habits and preferences with meat being a dominant ingredient (Albala, 2011). Following the nutritional transition trend, the demand for meat products will rise in proportion to the economic growth and the challenges of climate change and public health will arise inevitably (Doak and Popkin, 2017; Tudge, 2017).

Researchers call for sustainable diets as an opportunity to both advance the commitment to SDGs as well as addressing the issues of healthy nutrition and climate change (Johnston et al, 2014). The region can largely benefit in the long run as plant-based diets promote environmental and economic stability largely due to accessible food products as well as support public health costs via healthy nutrition. Johnston et al (2014) believe that the first step of addressing the problem is addressing the gaps in understanding what sustainable diet could be comprised of based on the cultural and local contexts. Consequently, these diets shall be assessed in the context of regional and global food and environmental systems (ibid). To date, climate extremes are on the verge of exceeding critical thresholds for agriculture meaning that effective solutions to reduce production risk will be required (Campbell et al, 2018). Climate change is already impacting the agricultural sector of many economies and the impacts on food systems are expected to be widespread and geographically complex (ibid).

Kazakhstan, as the largest economy of the region and has an opportunity to lead by example and assist other countries in the region with SDGs commitment (World Bank, 2019). The larger effects of climate change and public health can be addressed by re-evaluating the changing trends of livestock production and addressing the increasing demand for meat products. The country strives to become one of the developed nations by 2050 and cares about the health status and education levels of the youth (Akorda, 2012). Young people and their potential can be fully unlocked when they are encouraged to follow healthy behaviors and informed about the environmental impact they can contribute to based on their dietary lifestyle and choices.

8. Conclusion

Developing countries like Kazakhstan are currently going through the nutritional transition, which is characterized by increase in meat intake, adverse health effects as well as environmental challenges. The amount of NCD has increased in the country which puts additional burden on the healthcare and economic performance. Moreover, age dependency ratio is slowly increasing meaning that working people will be required to work consistently more to support non-working groups. The research studies how nutritional transition, and increase in meat consumption patterns, is impacting young people in one of the largest cities in the country - Almaty. The objective is to understand what the perceived barriers to switching and following plant-based diet are. The study implements KAP analytical framework to further guide the research. KAP framework is a commonly used tool in public health practices and is used to identify knowledge gaps and barriers to healthy behaviors.

Based on the literature review, two major challenges are identified that are linked with the increase of meat consumption worldwide. First of all, meat products, especially unprocessed meats have positive association with risk of CVD, some types of cancer, obesity and T2D. Kazakhstan has both increasing trend in meat intake per person as well as highest NCD mortality rate in the European region. Secondly, livestock production is now competing with humans and other species over the land, corps and freshwater resources. Moreover, one third of food corps in both developing countries is lost due to climate changes and excess waste respectively. The industry also causes increasing GHG emissions that contribute to global warming.

The study follows mixed-methods approach in analyzing data and answering the research questions. The quantitative data is collected using KAP survey while qualitative data is collected using interview and FGD methods. The quantitative part of the study runs under the limitation of non-representative sample since the data was gathered using non – random snowball sampling methods. Both quantitative and qualitative tools follow LUMID ethical guidelines to ensure transparency, validity, reliability and trustworthiness of the data. Quantitative data results showed that only a small portion of young people in Almaty are aware of positive relationship between red meat consumption and common NCD. Similarly, survey indicates low awareness regarding environmental impacts of meat consumption. Furthermore, people have generally good attitudes towards plant-based diet and vegetarians, however, are not willing to switch dietary habits unless a strong health related problem occurs. Finally, majority of young people consume processed slightly more often than unprocessed meat, averaging 4 times a week.

The results and analysis are based on the qualitative and quantitative data findings as well as the review of existing literature. Overall, the study found 3 major barriers towards following plant-based diet among young people in Almaty. The first barrier comes from low knowledge

levels about the consequences of meat consumption and existing beliefs about the ‘benefits’ of red meat. FGD shows that vegetarians are more aware of the health implications of meat-based diet and choose to follow plant-based consumption mainly for that reason. The second barrier is linked to cultural perception of meat and food practices. Historically, Kazakh people held large amounts of cattle and led nomadic lifestyle. This causes meat to become the central part of a table. In addition, masculine characteristics of the society and hospitality expect every guest to have a piece of meat. Therefore, refusing the offer is considered rude and often results in vegetarians feeling excluded from social circles and gatherings. The third barrier tackles the issue of affordability and accessibility of meat free products in Almaty. Leading vegan lifestyle is much more expensive than following traditional diets. Moreover, majority of restaurants and cafes do not offer vegetarian menus and thus vegetarians spend extra time looking for suitable places to eat out.

Finally, addressing the meat consumption trends is a challenge that is suggested to be analyzed and approached from the local perspective and context. Plant based or sustainable diets can vary based on the geography and culture, however if addressed and implemented well, it will almost always result in long lasting economic and environmental benefits. The whole region of Central Asia will likely share the same burdens of nutritional transition and regional cooperation and commitment to SDGs like Good Health, Responsible Consumption and Climate change is needed.

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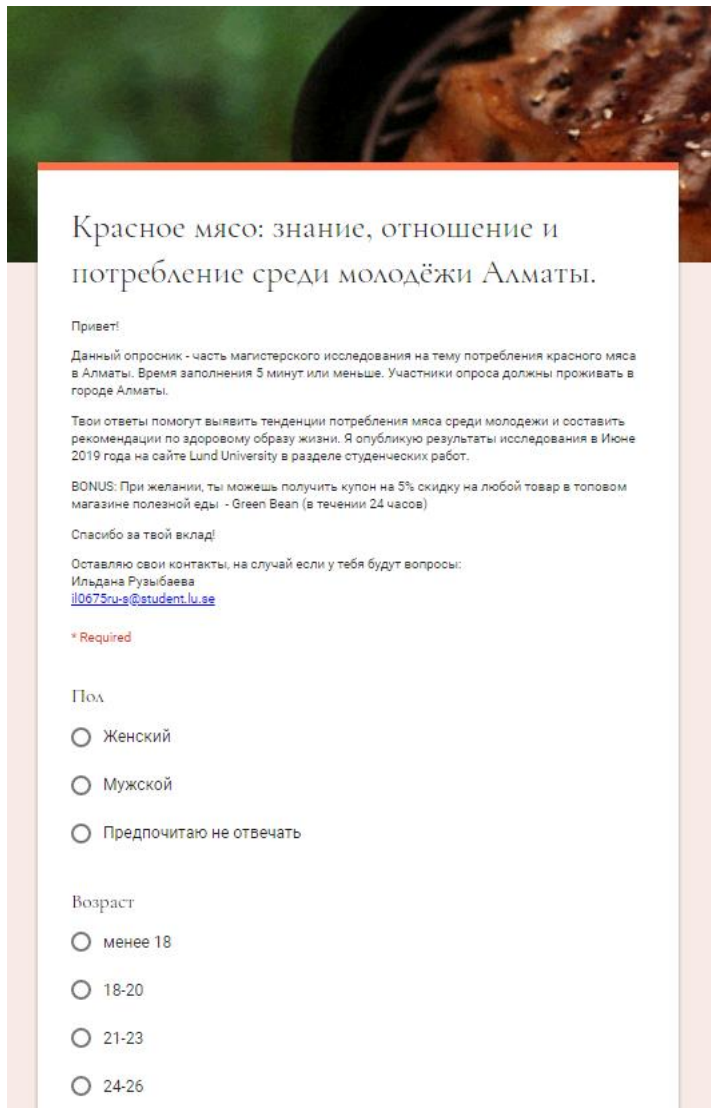
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10. Appendix

A. Knowledge, Attitudes and Practices Survey (extracts from Russian and English versions)



Красное мясо: знание, отношение и потребление среди молодёжи Алматы.

Привет!

Данный опросник - часть магистерского исследования на тему потребления красного мяса в Алматы. Время заполнения 5 минут или меньше. Участники опроса должны проживать в городе Алматы.

Твои ответы помогут выявить тенденции потребления мяса среди молодежи и составить рекомендации по здоровому образу жизни. Я опубликую результаты исследования в Июне 2019 года на сайте Lund University в разделе студенческих работ.

BONUS: При желании, ты можешь получить купон на 5% скидку на любой товар в топовом магазине полезной еды - Green Bean (в течении 24 часов)

Спасибо за твой вклад!

Оставляю свои контакты, на случай если у тебя будут вопросы:
Ильдана Рузыбаева
ii0675ru-s@student.lu.se

* Required

Пол

Женский

Мужской

Предпочитаю не отвечать

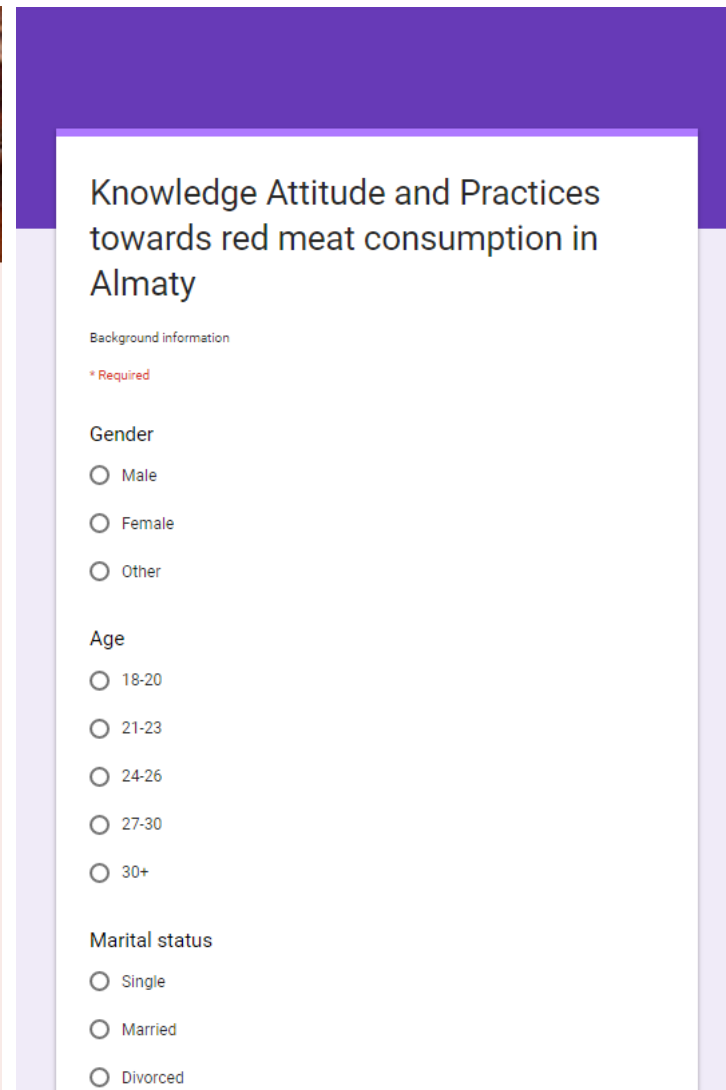
Возраст

менее 18

18-20

21-23

24-26



Knowledge Attitude and Practices towards red meat consumption in Almaty

Background information

* Required

Gender

Male

Female

Other

Age

18-20

21-23

24-26

27-30

30+

Marital status

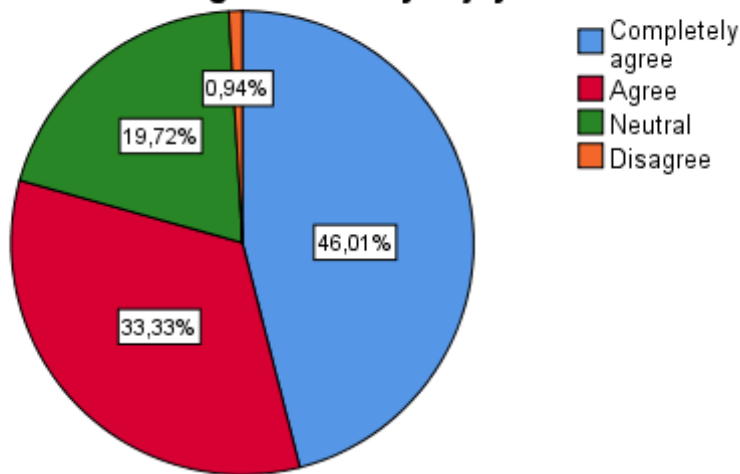
Single

Married

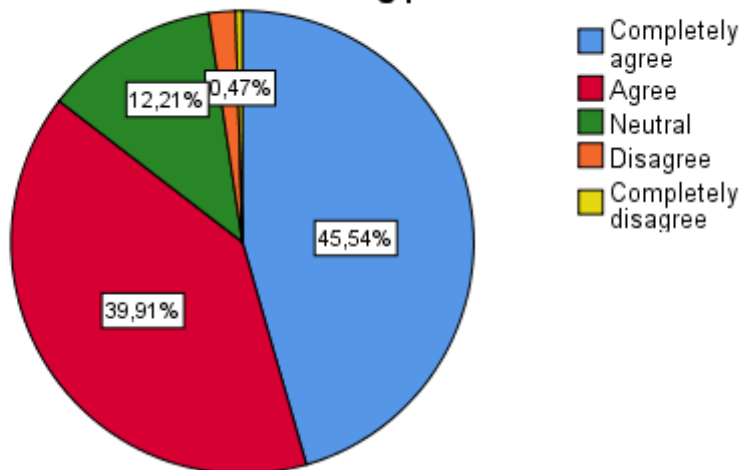
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B. KAP survey results

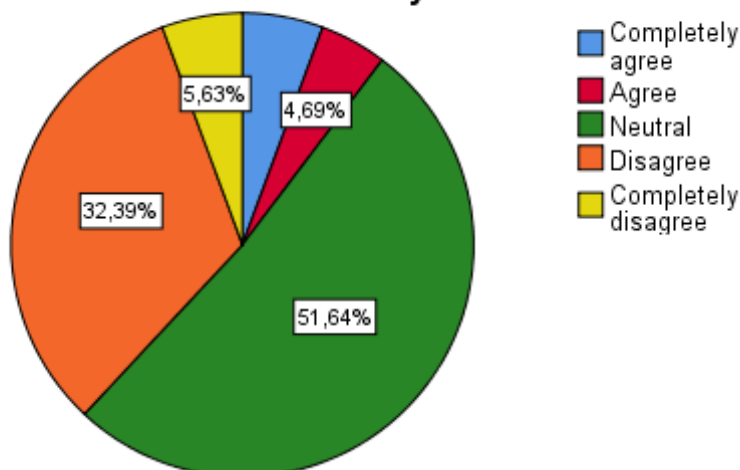
Eating meat is very enjoyable



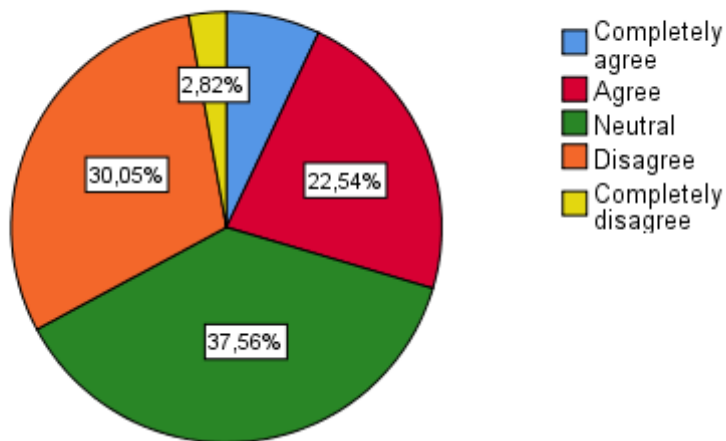
Meat based food is a big part of our culture



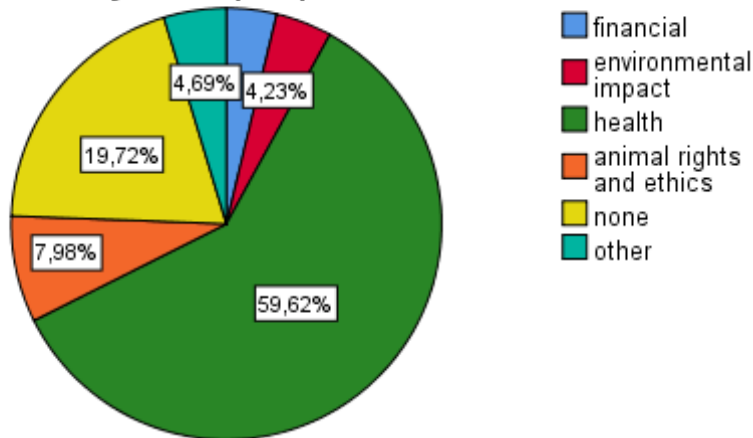
Plant based diet is not as healthy as red meat based diet



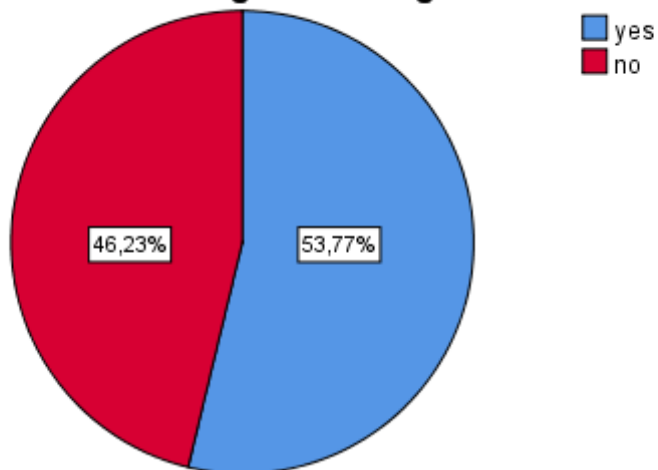
Plant based diet is less affordable than red meat based diet



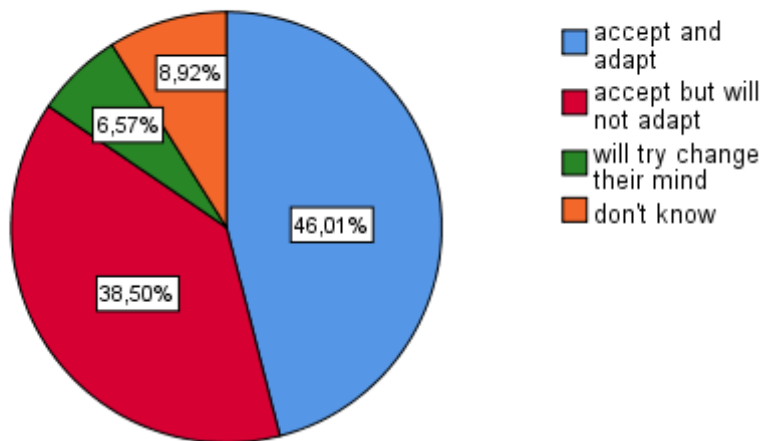
Which of the following reasons would most likely make you adopt a plant-based diet?



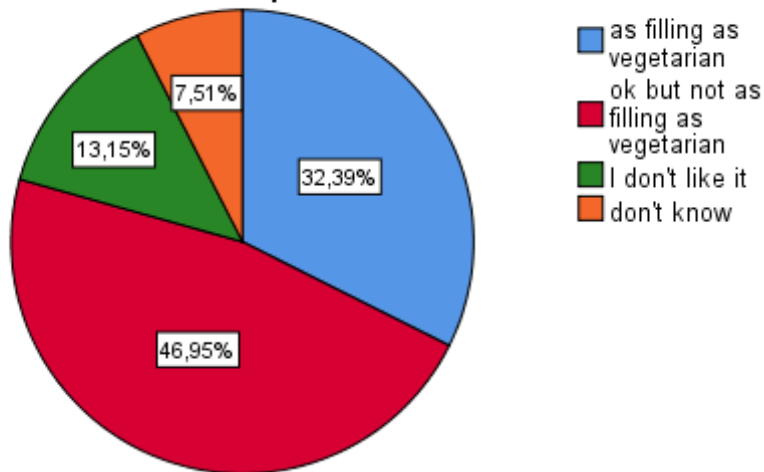
Presence of a vegetarian / vegan friend or relative



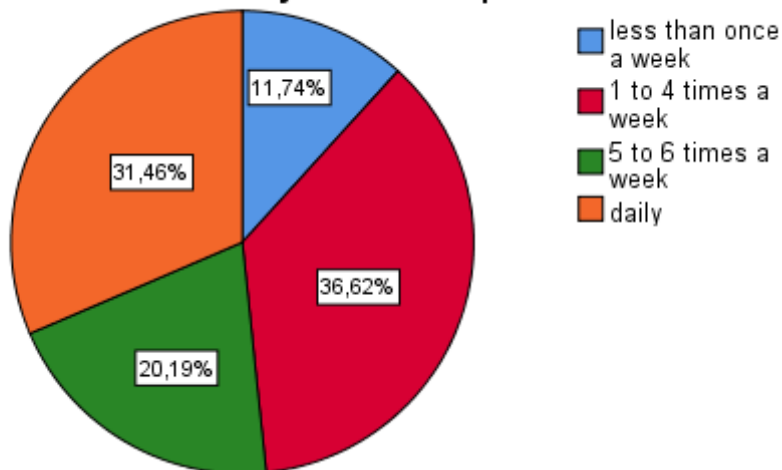
If one of your close family members becomes vegetarian I will



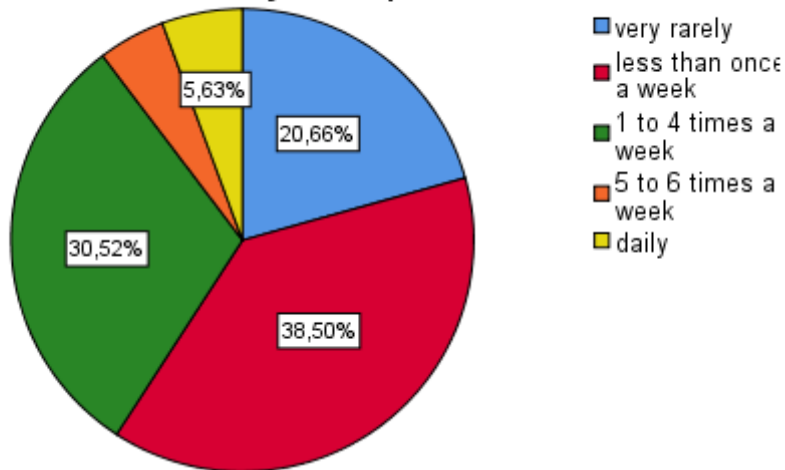
I find plant-based diet



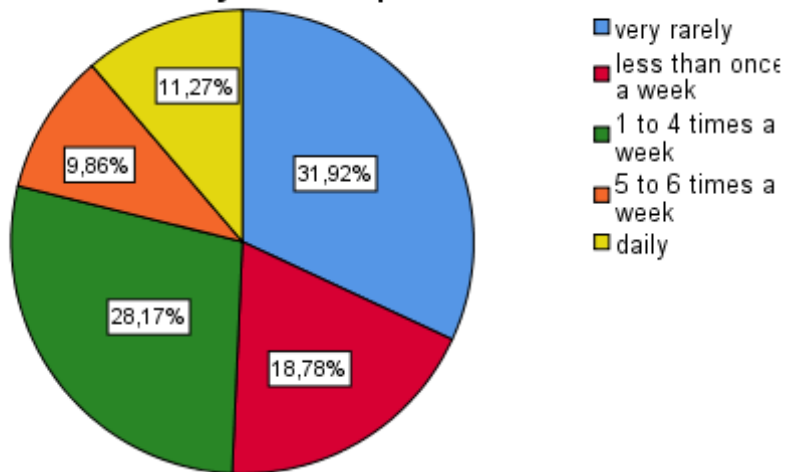
How often do you eat meat products?



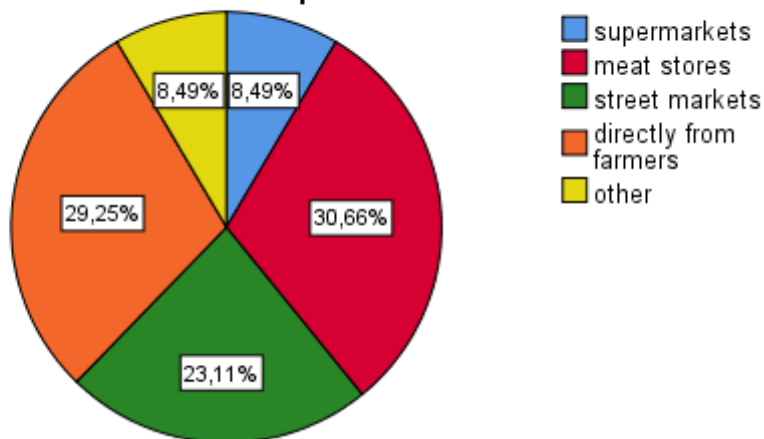
How often do you eat processed meat?



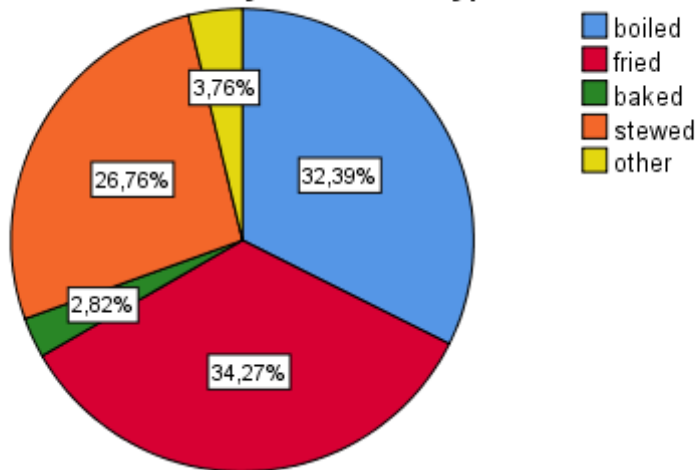
How often do you eat unprocessed red meat?



Where does your household purchase red meat and red meat products?



Most commonly consumed type of red meat



During the last 3 years, the quantity of meat consumed in our household has

