

**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

**Department of Trade and Finance**



**Bachelor Thesis**

**Sugar consumption trends in selected areas of the  
Russian Federation**

**Polina Kulik**

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# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

## BACHELOR THESIS ASSIGNMENT

Polina Kulik

Economics Policy and Administration  
Business Administration

Thesis title

**Sugar consumption trends in selected areas of the Russian Federation**

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### Objectives of thesis

The main objective of this thesis is to evaluate sugar consumption in different parts of the Russian Federation such as Moscow, Saint Petersburg, Stavropol Region, Rostov Region and Republic of Karelia.

### Methodology

The goal of the theoretical part is the comprehension of sugar industry in the whole world and in the Russian Federation. The practical part is based on survey analysis and shows how sugar influences on people's health. According to the survey, it will be possible to understand if the consumption of sugar products is affected by advertisement and what expectations people have about the sugar prices. This survey will also help to understand which particular type of sugar is the most popular in different regions of Russia and how many sugar based calories people generally consume. The theoretical part of this thesis performs an overview of the sugar industry, both worldwide and in Russia. All data is based on scientific research, sources from the Internet, books and is analysed by the author. It will give a detailed overview on prices of sugar, export and import, worldwide sugar production, etc.

The practical part evaluates the respondents' answers based on the survey analysis consisting of both – qualitative and quantitative approaches. This survey derives input from different age groups, genders and specific regions of Russia.

The conclusion will show overview of theoretical and practical parts.

**The proposed extent of the thesis**

30-40 pages

**Keywords**

Sugar, consumption, export, import, price expectation, Russia, health, types of sugar, economy, agriculture.

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C.A.B. INTERNATIONAL, ISSUING BODY., – CHEESMAN, O. *Environmental impacts of sugar production : the cultivation and processing of sugarcane and sugar beet*. Wallingford, Oxfordshire, UK: CABI, 2004. ISBN 0851999816.

FEENSTRA, R C. – TAYLOR, A M. *International trade*. New York: Worth Publishers, 2017. ISBN 978-1-319-12763-3.

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Vedomosti.ru. 2015. Rosstat: in 2015, cereals and sugar rose in price most of all – by an average of 40-42%. [online] Available at: <<https://www.vedomosti.ru/business/articles/2016/01/13/623761-..>>

Wright, J., 2022. 15 Types of Sugar, Their Origins, Forms, and How to Use Each One. [online] Food Fire Friends. Available at: <<https://www.foodfirefriends.com/types-of-sugar/>>

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### **Declaration**

I declare that I have worked on my bachelor thesis titled "Sugar consumption trends in selected areas of the Russian Federation" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on date of submission

14.03.2022

### **Acknowledgement**

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# **Sugar consumption trends in selected areas of the Russian Federation**

## **Abstract**

Sugar production is a big part of the agricultural sector. Sugar is also an essential component for normalizing the activity of the central nervous system. Since the year 2016, prices on sugar in the Russian Federation have started increasing tremendously. Government implemented new reforms that lead to the development of sugar production inside the country. Currently, consumption of sugar exceed norms that were stated by WHO (World Health Organization). The study concludes sugar consumption in the specific regions of Russia and highlights how excess sugar effects on humans' health. A survey was performed and it analyzed how much sugar is being consumed by people and if they are concerned about their health. At the same time, the trade surplus in sugar was detected in 2020 year according to the Balance of Trade.

**Keywords:** Sugar, consumption, export, import, price expectation, Russia, health, types of sugar, economy, agriculture.

# Vývoj spotřeby cukru ve vybraných oblastech Ruské federace

## Abstrakt

Výroba cukru je velkou součástí zemědělského odvětví a je nezbytnou složkou pro normalizaci činnosti centrální nervové soustavy. Od roku 2016 začaly ceny cukru v Ruské federaci enormně růst. Vláda provedla nové reformy, které vedou k rozvoji výroby cukru uvnitř země. V současné době spotřeba cukru překračuje normy, které stanovila WHO (Světová zdravotnická organizace). Studie shrnuje spotřebu cukru v konkrétních regionech Ruska a poukazuje na vliv nadměrného množství cukru na lidské zdraví. Pomocí provedeného průzkumu bylo analyzováno, kolik cukru lidé konzumují a zda se obávají o své zdraví. Zároveň byl zjištěn přebytek obchodu s cukrem v roce 2020.

**Klíčová slova:** Cukr, spotřeba, vývoz, dovoz, očekávaná cena, Rusko, zdraví, druhy cukru, hospodářství, zemědělství.

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## List of abbreviations

WHO – World Health Organization

BOT – Balance of Trade

# 1 Introduction

Archaeologists today are studying the history of sugar. Sugar cane began to be cultivated about 10,000 years ago, and a little later in India. In Russia, sugar began to gain popularity at the beginning of the 18th century, but it was available to a few, and the raw material for it remained an imported commodity in Russia for another two hundred years. Later, sugar began to be obtained from domestic sugar beets (The Sweet Poison of Our Lives: A History of Sugar | DW | 12.08.2019, 2022).

Sugar is very important for normalizing the activity of the central nervous system. People's organism needs glycogen that supports liver and heart functions. However, overconsumption of this product leads to multiple diseases such as cavities, cardiovascular, diabetes, etc. According to the multiple researches, many people affected by advertisements on the TV and Internet. Especially marketers influence on children, as they watch more than 50% food ads of the whole amount. At the same time, people do not know how much sugar they consume daily and they do not familiarize with ingredients of the product. Many manufactures use sugar preservatives to prolong lifespan of the products and increase its flavor, but the taste of sugar will not be obvious in that case.

There are two main sugar processing – beet and cane. From these two manufactures, people can make different types of sugar. The difference between these types will be perform in this thesis.

Sugar industry is an essential part for the economies of the countries. In this bachelor thesis author wants to analyze sugar consumption in the Russian Federation. This country is developing its own sugar production especially since 2015 year and the trend of the export is slightly increasing until now. However, Russia still import sugar from other countries such as Germany, Kazakhstan and China. The worldwide leaders in sugar production are Brazil, India and European Union. As sugar is basic ingredient for many products, its prices affect the food market. If prices on sugar are too high, people will have to reduce their consumer basket of good, that is obviously has negative effect for the economies.

## **2 Objectives and Methodology**

### **2.1 Objectives**

The main objective of this thesis is to analyze sugar consumption in different parts of the Russian Federation such as Moscow, Saint Petersburg, Stavropol Region, Rostov Region and Republic of Karelia. Partial objectives are represented as following:

- To provide comprehension of sugar industry in the whole world and in the Russian Federation
- To perform effect of sugar on people health
- To find balance of trade in Russia of sugar products
- To analyze advertisement exposure
- To reflect expenses on sugar products

### **2.2 Methodology**

The theoretical part of this thesis performs an overview of the sugar industry, both worldwide and in Russia. All data is based on scientific research, sources are from the Internet, books and journals, which are further analyzed by the author. It will give a detailed overview on prices of sugar, export and import, worldwide sugar production, advertisement exposure.

The practical part evaluates the respondents' answers based on the survey analysis consisting of both – qualitative and quantitative approaches. This survey derives input from different age groups, genders and specific regions of Russia. There are 18 questions and 122 respondents. The description will be provided with different types of graphs, pie chart, diagrams, etc. This part will perform how much exposure we have because of advertisements on TV and how it affects such a vulnerable group as children. Author also mentioned consequences of sugar overconsumption on people's health. According to the survey, it will be possible to understand if the consumption of sugar products is affected due to advertisements and also what expectations people have about the sugar prices. This survey will also help to understand which particular type of sugar is the most popular in different regions of Russia and how many sugar based calories people generally consume. The conclusion will show overview of theoretical and practical parts.

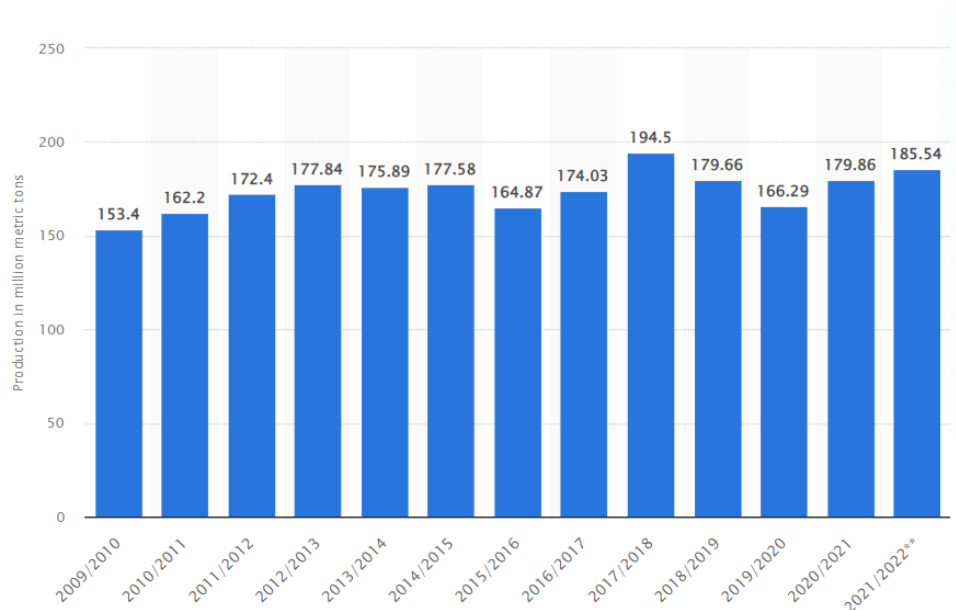
### 3 Literature Review

#### 3.1 Sugar production

By the end of the 20<sup>th</sup> century, sugar production had increased. Sugar plantations were mostly located in tropical areas such as parts of Spain, Iran, North Africa and Pakistan. However, sugar crops have been increasing with developing and changes in cultivation systems(Cheesman, 2004). Currently, approximately 110 countries produce sugar from cane (sugarcane is 80% of global sugar production). and beet. Sugar crops are widely used not only in food production, but also in livestock feed, fiber and energy. For example, biofuels – sugar-based ethanol(About Sugar | International Sugar Organization, 2022).

The figure 1 shows the total sugar production worldwide between 2008 and 2022 years. In 2014-2015 Asia (especially India, China and Thailand) produced the largest amount of sugar in the world, yielding about 66.12 million metric tons of sugar, while Russia and France were the primary sugar beet producers in 2014. According to the prediction for 2021/2022 years the consumption of sugar is increasing - it might be around 185.54 million metric tons of sugar overall. However, maximum amount of sugar during this period was produced during 2017/2018 years.

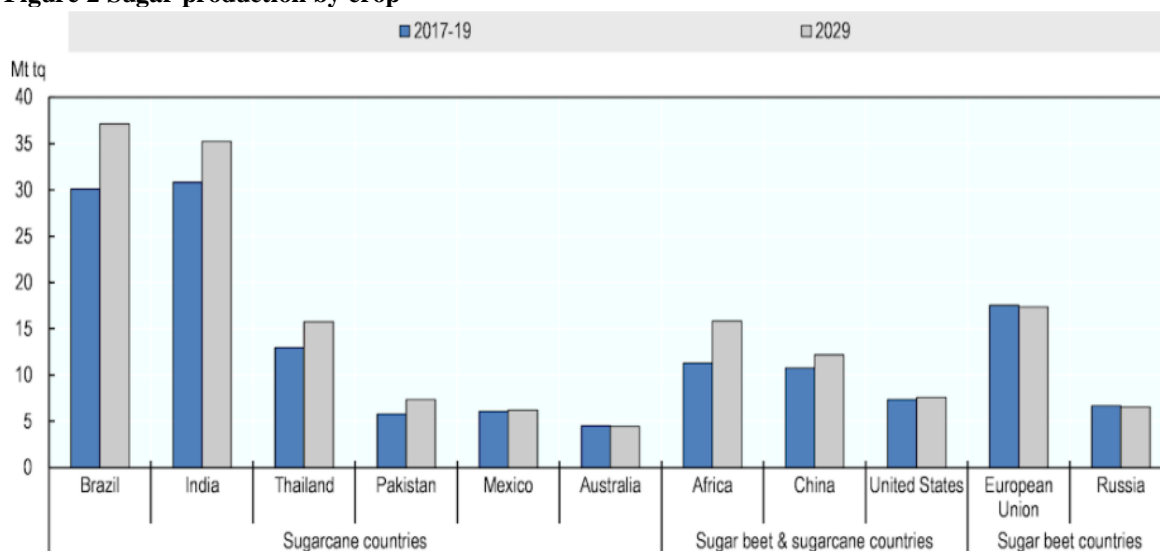
**Figure 1 Total sugar production worldwide from 2009/2010 to 2020/2021 (in million metric tons).**



Source: statista.com

The bar chart below represents sugar production by crop in different countries, with predictions for 2029. According to the prediction, production of sugar in the Russian Federation probably will not change much until 2029. The Russian Federation has achieved a high level of self-sufficiency in the sugar industry. At the same time, export of sugar is not competitive in compare to other countries and Russia remains a high-cost producer. The first place among all countries is taken by India for 2017-2019, whereas Brazil will be the leader for the next decade. European Union will maintain third largest producer and the world-leading producer of beet sugar.

**Figure 2 Sugar production by crop**



Source: OECD/FAO (2020), “OECD-FAO Agricultural Outlook”, OECD Agriculture statistics (database).

### 3.1.1 Types of sugar

The type of sugar is determined by the method of processing cane or beet. There are following types of sugar:

- Granulated sugar (white sugar) – this is the most famous type of sugar in Russia. Due to its structure, this type of sugar is ideal for dissolving and subsequent preparation of drinks.

- Caster sugar - they are tiny crystals. It is preferred by professional bakers because it is light and dissolves easily in egg whites. This sugar is commonly used in delicate confectionery.
- Confectioners' sugar (powdered) - white granulated sugar, which is crushed into powder. Manufacturers mill granulated sugar and, because they need to prevent clumping, they mix it with a small amount of cornstarch (3%).
- Brown sugar - it can be refined and unrefined. White sugar with molasses boiled into a thick dark syrup. Mainly used with granulated sugar in baking.
- Cane sugar – most commercial type, as it could be converted to any type of sugar. It is believed, that cane sugar is the healthiest one. However, research did not prove it.
- Fruit sugar – this type of sugar stir in pudding mixture and gelatin. The flavor is very similar to white granulated sugar(Wright, 2022).

### **3.2 Sugar consumption and human health worldwide**

Sugar demand affected by four main characteristics. The first one is the *population growth*. There is a simple explanation: as population is increasing - demand on sugar is increasing respectively. However, *incomes per capita* might effect on people's desire to buy sugar products. Sugar is an important component of many products, but if the income of the person is less than average, he or she will have to reduce sweets in daily grocery basket. At the same time, people can prefer *alternative sweeteners*, if the price on sugar will be too high or if they will have to reduce sugar consumption because of health's issues. Artificial sweeteners are much sweeter than sucrose. They do not have such an energy load and do not require insulin for absorption. Such substitutes are called nutritional supplements, and although they look like an excellent replacement for sucrose, sweeteners still require further study(Brook, 1969). The last, but not the least is *health concern debate*. Today there is a propaganda against inadequate sugar consumption and there are some strong arguments how much sugar can affect our health(About Sugar | International Sugar Organization, 2022).

Many food manufactures use sugar preservatives to prolong lifespan or to increase flavor. That how people consume too much sugar and they do not even know that these

products contain it. However, the inadequate consumption of sugar can lead to various problems with health. One of the most serious disease is cardiovascular. The study provided in JAMA Internal Medicine among people who consumed different amount of sugar showed, that "Basically, the higher the intake of added sugar, the higher the risk for heart disease," - Dr. Hu(The sweet danger of sugar - Harvard Health, 2022). Unfortunately, sugar can also cause problems with teeth (like cavities), skin (too much sugar damage collagen and elastin of the skin), liver (non-alcoholic fatty liver disease and non-alcoholic steatohepatitis), pancreas, kidneys, etc. The metabolism of sugar can begin in the mouth of a person and it turns out there that it has a detrimental effect on the teeth(Vladimir, 2017).

Moreover, inappropriate consumption leads to overweight and that is the big issue for our century. What is an appropriate consumption then? Doctors recommend do not consume more than 200 calories – it is approximately 12 teaspoons per day. However, people still eat much more sugar and do not pay much attention on it(How Does Too Much Sugar Affect Your Body, 2022).

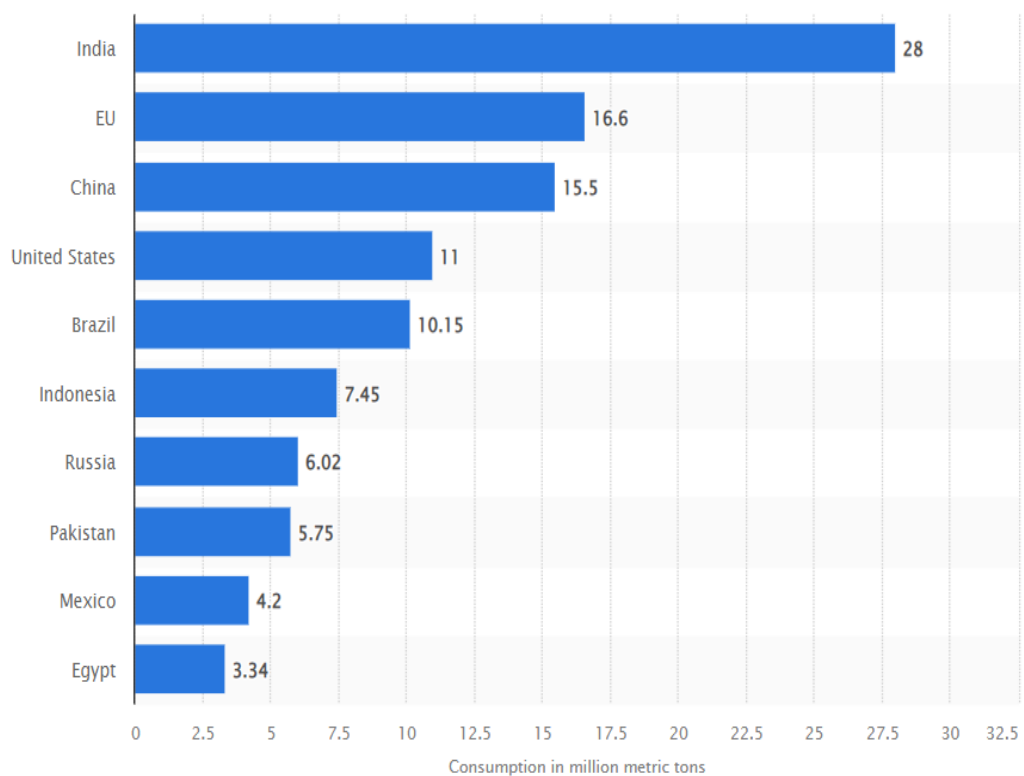
When a person consumes sugar, it first comes to the liver in the form of glycogen. However, people consume so much sugar and the liver not being able to synthesize all of it. In that case, sugar is converted into fat, weight is increasing, and blood sugar rises. There is a strong release of insulin; healthy calories turn into nothing more than fat. What is even worse is a person's addiction to sugar. When there is an increase in glucose in the body, it causes a desire to get even more sugar. In addition, excessive consumption of sugar leads to a lack of B vitamins, which play important role in metabolism(Sweet death: how sugar affects the body, 2022). According to the recommendations from the World Health Organization, sugar intake should be less than 10% of total calories during the day.

According to the forecast in the report, under normal weather conditions, there will be minor changes in sugar prices in the global market. World reserves will increase(OECD and FAO Report – Agricultural Outlook 2021-2030, 2021).

The graph below shows sugar consumption between leading countries within 2020/2021. White, brown and confectioner's sugar are included in this statistic. The first place takes India – 28 million metric tons. However, sugar consumption per capita is relatively small than in other countries. It is in average about 23 kg per capita and now has

a surplus of sugar. The second position takes all countries from European Union – 28 million metric tons. However, the consumption per capita is much more than in India. It is about 36.7 kg. Russia in this list is the seventh country with consumption of 6.02 million metric tons.

**Figure 3 Sugar consumption worldwide in 2020/2021, by leading country (in million metric tons).**



Source: statista.com

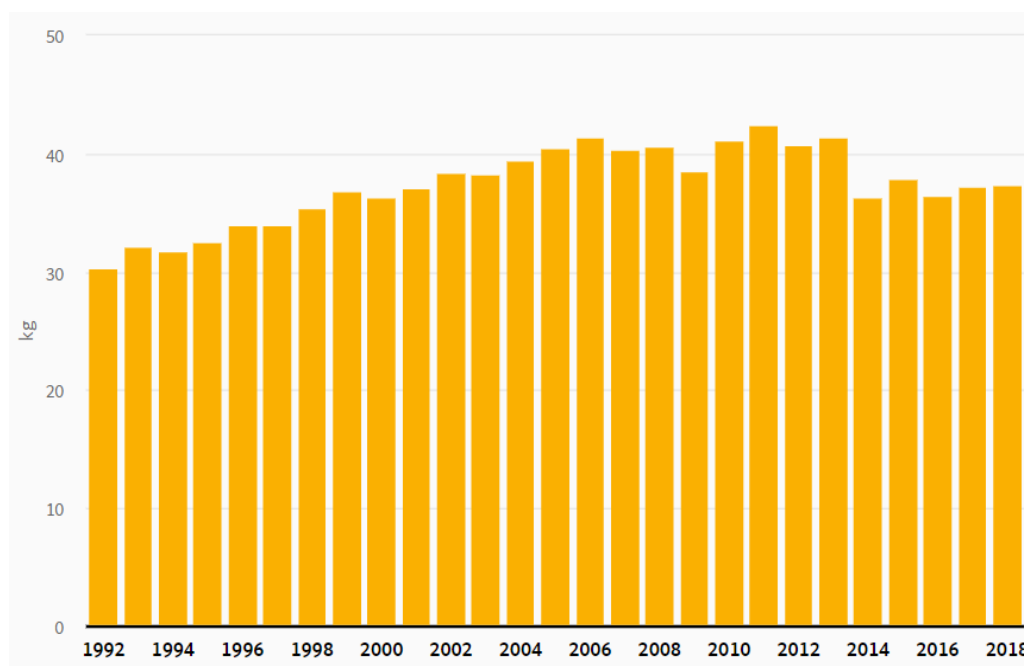
### 3.3 Sugar consumption in Russia

According to the recommendations of the Ministry of Health, the consumption of an average of 8 kilograms of sugar per capita per year meets the requirements of a healthy diet. However, the average Russian consumes sugar products almost 4 times higher than the norm. The region in which the consumption of sweets in the Russian Federation the highest is Ingushetia. On average, there are 66.7 kilograms of sugar per person in this region per year. In particular, people consume sugar in the form of sweets and chocolate (Russians have four times exceeded the norm of sugar consumption, 2022).



The figure 4 demonstrate sugar consumption in Russia per capita. As it clearly seen in this statistic that the highest consumption between 1992 and 2018 years reached 42.4 kg in 2011. Whereas the lowest consumption refers to the year 1992 – 30.2 kg per person. However, the drop of consumption was noticed in 2014 that happened because of the financial crisis in Russia (2014-2016).

**Figure 4 Sugar Consumption Per Capita in Russia**



Source: helgilibrary.com

### 3.3.1 Sugar price in Russia

Steady decline of the dynamics of world sugar prices was noted from the beginning of 2012 to August 2015. Since September 2015, the price trend has changed upwards. These changes had happened because of the currency exchange rate. As 10-15% of sugar is traditionally produced from imported raw cane - despite the fact that during the year its dollar price decreased, in rubles it still rose. In addition, with 60% of the import component in the cost structure of beet sugar, producers(Rosstat: in 2015, cereals and sugar rose in price most of all - by an average of 40-42%, 2015).

In 2019, sugar fell significantly due to overproduction in the market and the area in 2020 was seriously reduced. The trend of the price of sugar for the 2022 year is upward

and Russian expect increasing in price. However, the maximum price still belongs to the summer of 2016.

**Figure 5 Sugar Monthly Price - Euro per Kilogram**



Source: [indexmundi.com](http://indexmundi.com)

### 3.4 Import and export of Sugar in Russia

Population of the Russian Federation is 146039154 for the March, 2022(Russia Population (2022) - Worldometer, 2022). The country has a strong position in world beet sugar production, but due its large population Russia has not always been able to meet the demand for sugar. Between 2000 and 2012, numerous reforms were introduced to boost domestic sugar production and not depend so much on imports(Smutka and Maitah, 2014).

Nowadays Russia still cannot provide enough amount of sugar for all regions and import it mostly from the following list of countries: Germany (26 million US\$), Kazakhstan (17.9 million US\$), China (16 million US\$), Italy (15.8 million US\$). and Turkey (12.2 million US\$). The graph below represents import structure of sugar to Russia

between 2009-2020 years. The peak of import relates to 2013 – it was equal to 212,763,562 US\$. In contradiction, import in 2015 was the lowest. It was equal to 132,697,592 US\$. However, import reduction was already taking place in 2014 and this was due to the financial crisis in Russia. Import was slightly decreasing since 2019 until 2020. The reason is that Russia develops sugar production and now has much more this product inside the country.

**Figure 6 Import of Sugar**



Source: [trendeconomy.com](https://trendeconomy.com)

Since 2015, many CIS countries have been developing domestic sugar production. Kazakhstan, for example, has set up its own enterprises. Russia faces strong competition from Ukraine, Belarus and Azerbaijan. Moreover, only 8% of the sugar produced in Russia meets the highest standards(Gray, 2017).

The Russian sugar exports is expanding now. Since the minimum export of sugar, which was in 2014 (128,428,995 US\$), export has upwards tendency. According to the latest data from this graph, export in 2020 was equal to 178,578,659 US\$. However, export of sugar reached maximum point in the 2013 year - 212,763,562 US\$. Russia's sugar export supply exceeds that of Cuba (1 million tons) and the EU (1.1 million tons).

**Figure 7 Export of Sugar**



Source: [trendeconomy.com](http://trendeconomy.com)

### 3.5 Advertising exposure

The lack of nutrition awareness is a big problem for humanity. Unfortunately, people make their choices based on different advertisement and do not consider scientific research about products. Most of them rely on external sources without even thinking and analyzing, what if this product harmful for health?

Marketing communication also based on repetition. The first ad familiarize person with product, the second one reflect the relevance to consumer, the third ad reminds about product's benefits. People see many ads about sweetness, chocolates and other products that contain sugar. They see happy faces, cheerful people, but they do not research about ingredients of this product(Heiss, Naderer and Matthes, 2020). Advertising a particular brand also affects the greater likelihood of buying a particular product(Tellis, 1988).

The most significant role advertisement plays among children. They watch more than 50% food ad and affected by it. Food advertising mostly emphasizes taste, entertainment elements, emotions, special offers, and the use of recognizable characters that appeal to children. As noted by experts, marketing and advertising of foods high in sugar, fat, or salt influences children's choices and preferences for these foods and beverages. Children influence their parents to buy unhealthy foods, which leads to frequent consumption of

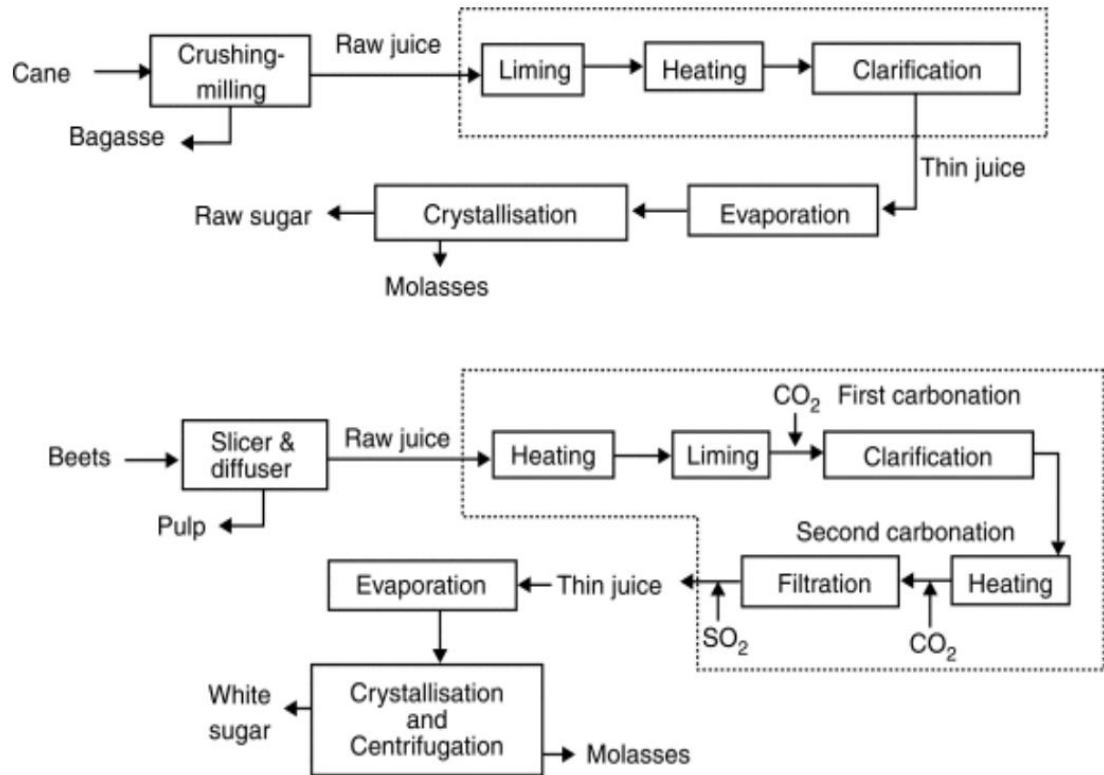
these products. As a result - children obese. It increases the probability of many diseases in such a young age that leads to deterioration of the health of the whole generation(Escalon et al., 2021). The advertisement of sweet drinks and chocolate is the most popular in Russia; it represents 19% of the total number of commercials on TV(Generic Promotion of Cocoa and Chocolate in the Russian Federation, n.d.).

### **3.6 Sugar processing**

Sugar cane and sugar beet contain approximately about 20% of sugar. However, producers prefer sugar cane – it takes 75% of global sugar market and only 25% from sugar beet(Food & Beverage, 2015).

The figure 8 describes the sugar cane and beet processing. The cane processing starts with crushing-milling, then raw juice come to the main phase: liming, heating, clarification. After main phase, this juice is received and it is evaporated. The last step is crystallization and it how manufactures receive raw sugar. The processing of beet sugar is slightly different. The first step begins from slicer and diffuser, as it was in cane processing, manufactures receive raw juice, but main phase starts with heating, and only then with liming. The end of the main phase is not the same, as after clarification there are two more steps: again heating and filtration. That how manufactures receive thin juice. The end of this processing followed by evaporation and crystallization & centrifugation. (Singh, 2015).

Figure 8 Sugar processing



Source: Membrane Technology and Engineering for Water Purification, p.23

## **4 Practical Part**

### **4.1 Research methods**

This research is based on quantitative survey with 18 questions, which includes 122 respondents' answers. With the help of this survey author will analyze consumption of sugar in calories per capita in Russia among Russian citizens. The results will be compared with recommendations of WHO using mean, mode and sample standard deviation. This survey will help to find the most popular type of sugar in the specific regions of the chosen country. The Balance of Trade will show the difference between the monetary value of a country's imports and exports over a given period. In the end author will analyze population's expectation of increasing price on sugar products.

#### **4.1.1 Respondent sample**

Respondents who filled out this survey are from following regions from Russia:

- Moscow
- Saint Petersburg
- Stavropol Region
- Rostov Region
- Republic of Karelia

Moscow and Saint Petersburg are main cities in the Russian Federation, it is important to reflect consumption of sugar in these areas. Stavropol region is famous for its agriculture sector and located near Krasnodar region, where production of sugar takes place. Rostov-on-Don is the largest city in southwestern Russia, the administrative center of the Southern Federal District. The Republic of Karelia is part of the northwestern Federal District, is part of the Northern Economic Region. These two region are located in different parts of Russia, it will be important to analyze the difference in consumption between north and south areas.

All respondents are with different income level, of all genders and age-groups starting with 18 and more.

#### **4.1.2 Survey notes**

This survey was distributed in the specific regions of Russia; therefore, it reflects the consumption of sugar only in chosen areas. Most respondents are from the Republic of Karelia. Consumption of calories per day and calories from sugar products were calculated by respondents specifically for this survey. The answers about advertisement and price expectations are subjective and based on respondents background. The amount of money spent on sugar products by the participants and their income data was converted from the Russian Ruble (RUB) to Euro(EUR) at  $1\text{RUB}=0.011\text{EUR}$ .

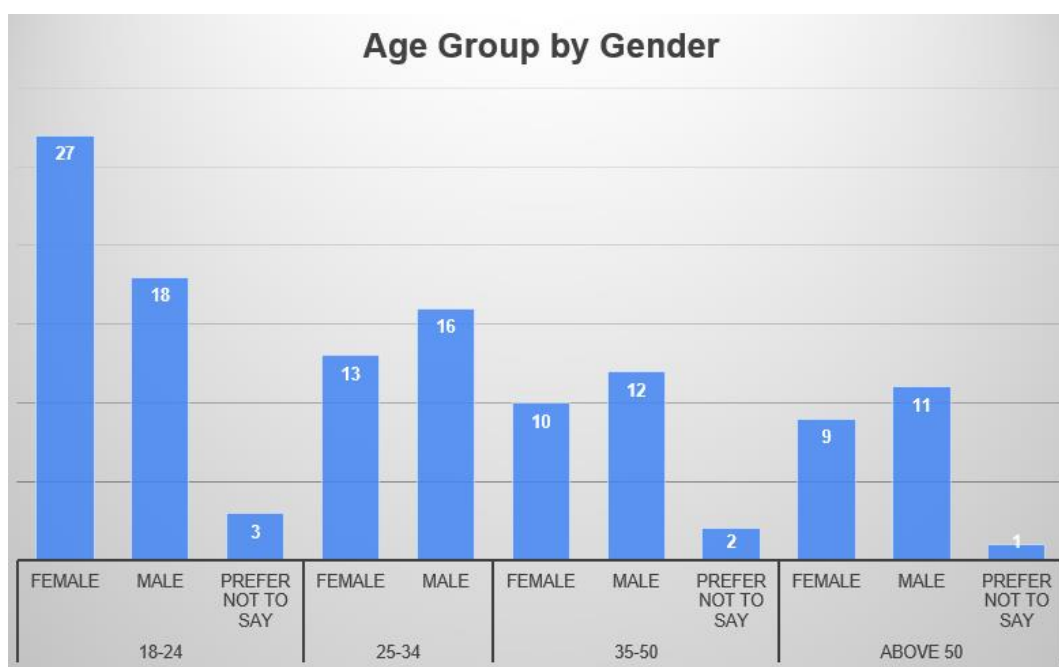


## 5 Results and Discussion

### 5.1 Representation of respondents

This histogram below represents age group by gender. The results are following: 59 women, 57 men and only 6 people preferred not to mention their gender. The most popular age group is 18-24: 48 people that makes 39% of the total number of participants. The second one is 25-34: 29 people and 24%; the third age group is 35-50: 24 people and 20% and the last age group is people above 50 years old: 21 participants that makes 17%.

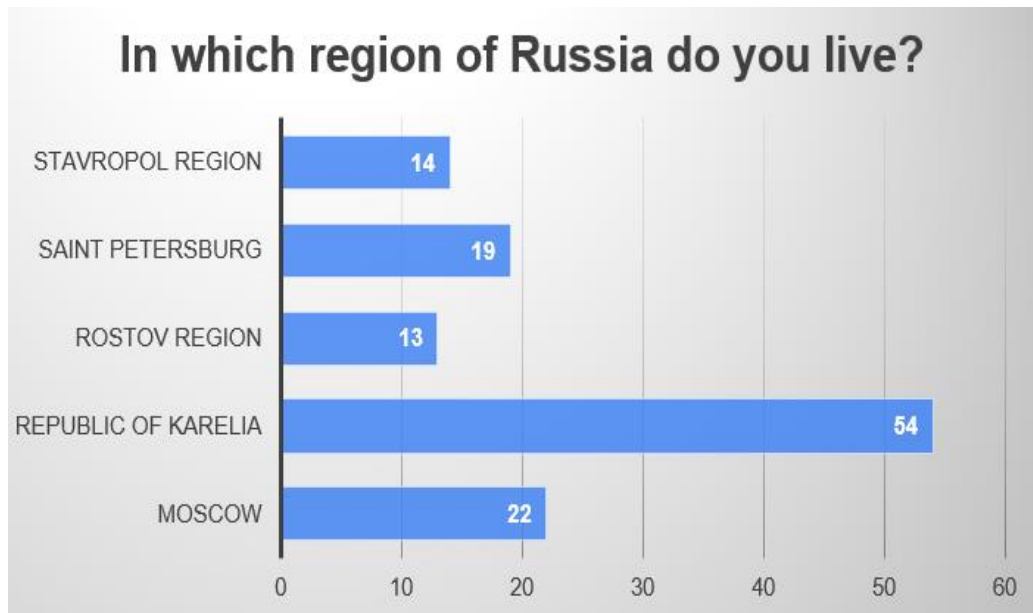
Figure 9 Age group by gender



Source: based on survey results

Most representatives of this survey are from the Republic of Karelia – 54 people. Next high numbers belong to people from Moscow and Saint Petersburg – 22 and 19 people respectively. Rostov and Stavropol regions are in minority – 13 and 14 respectively.

Figure 10 selected regions in Russia

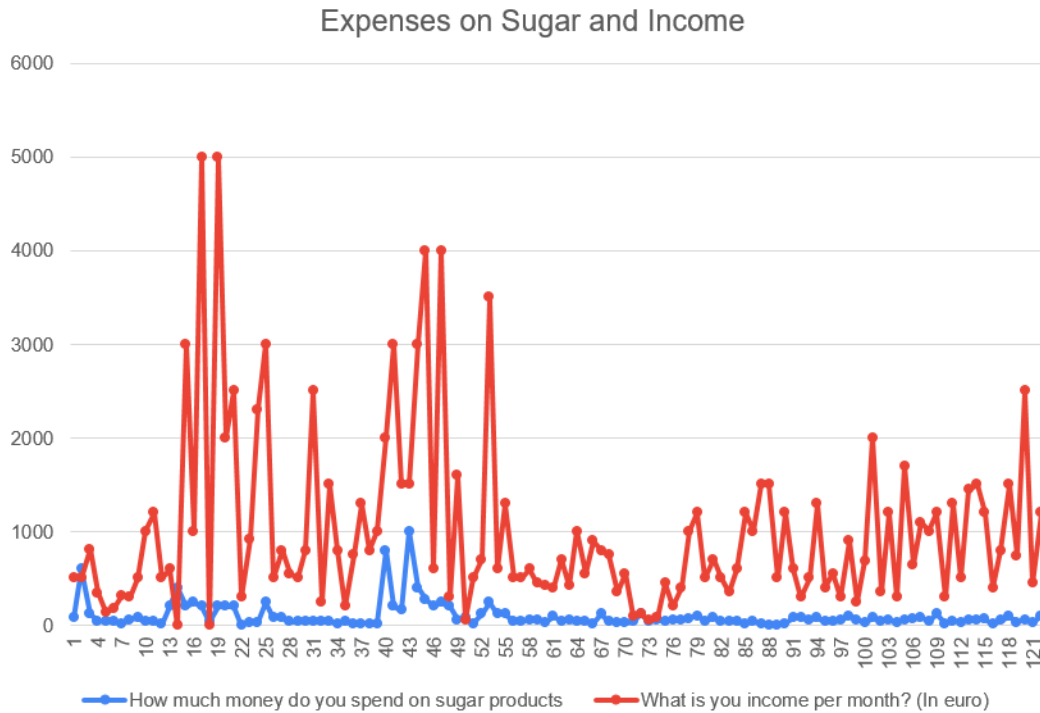


Source: based on survey results

### 5.1.1 Expenses on Sugar Products

The figure 11 represents income of Russian citizens (red curve) and their expenses on sugar products (blue curve). According to this graph, it is possible to mention that people with the highest income (which is 5000 EUR per month) do not spend a big part of their income on sugar products. Maximum amount of money which person spent on sugar production per month is 121 EUR, with the income of 1200 EUR. It is important to mention that as many respondents are from the age group 18-24, they are mostly students and do not have stable income. The **correlation between general income of the person and expenses on sugar products** was calculated in Excel as **3.4** that represents very small value. Therefore, these two variables are not correlated with each other. Even people with small income or without stable income (students) can afford to spend more money on sugar products than people with higher income do. Concluding, people consider sugar as very important product in their grocery basket and no matter which income they have they will not exclude sugar from their daily ration.

**Figure 11 Expenses on Sugar and Income**



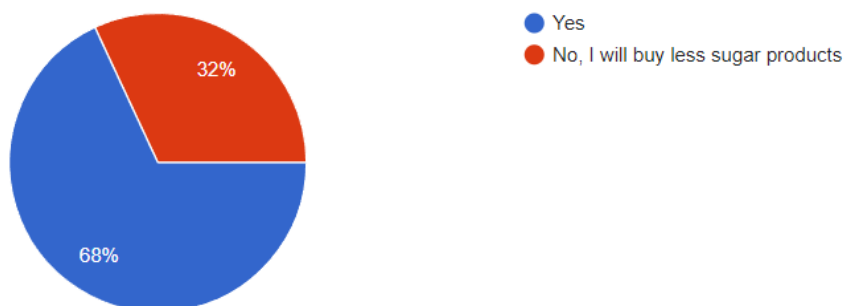
Source: based on survey results

To confirm that income does not affect expenses on sugar too much, respondents were asked the following question: If the price of sugar increases will, you still buy the same quantity. As it clearly seen from the pie chart below, only 32% of total amount will buy, less sugar products and 68% will continue to buy the same quantity.

**Figure 12 Theoretical question**

If the price of sugar products increases will you still buy the same quantity?

122 responses

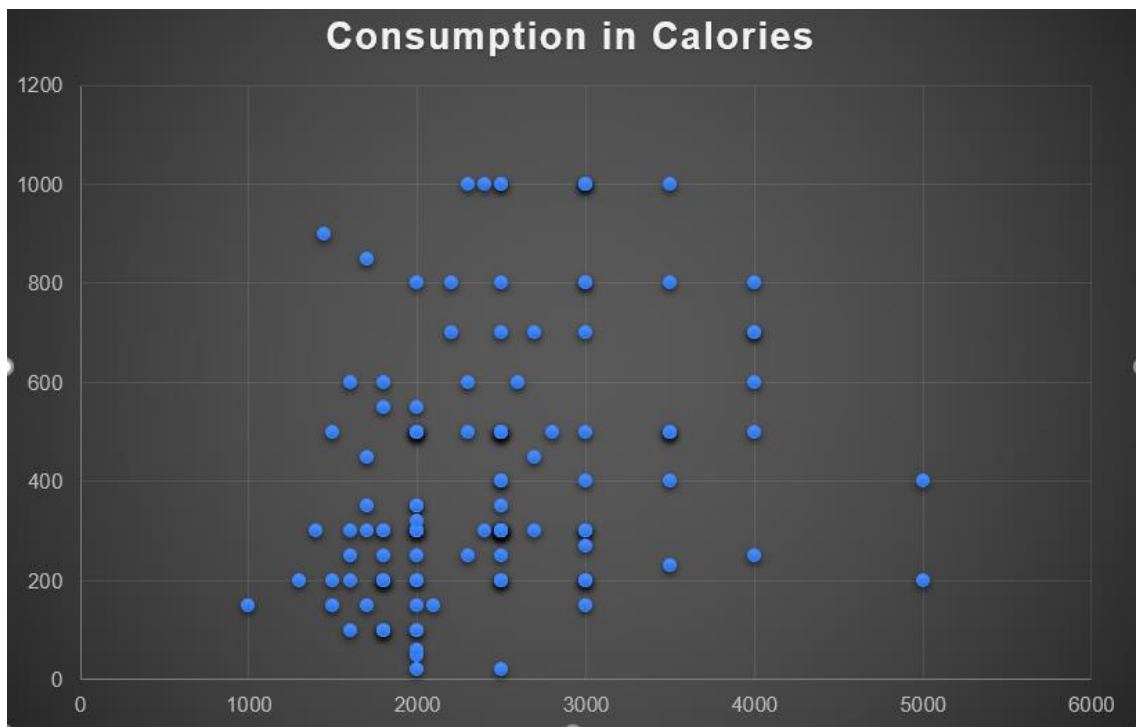


Source: based on survey results

### 5.1.2 Sugar consumption

As it was mention in the literature review, according to WHO, sugar intake should be less than 10% of total calories during the day (strong recommendation) and 5% of total calories (fair recommendation). The survey revealed how much calories people in Russia consume per day (horizontal axis) and how much of them are from sugar products (vertical axis).

Figure 13 Consumption in Calories



Source: based on survey results

According to the data from the survey, author calculated mean, mode and standard deviation of calories. Mean is an average number of all calories consumed per day is 2432.377 and 415.7377 from sugar products. The mode (is the most frequently occurring number) for calories per day is 2500 and 300 for calories from sugar. The per cent of sugar from all calories is equal to 17% that exceed WHO's recommendation. Therefore, people consume more sugar than they should.

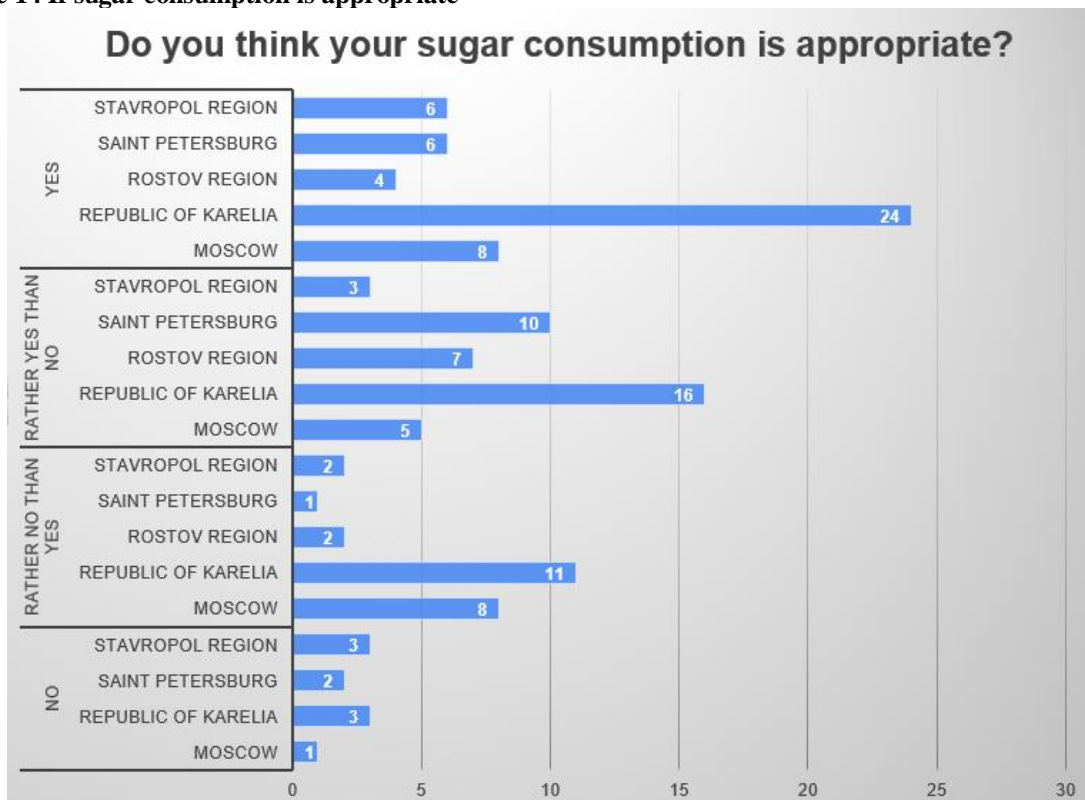
**Table 1** Statistic calculation

	mean	mode	Standard deviation	% of sugar from all calories
Calories per day	2432.377	2500	733.297	
Calories from sugar	415.7377	300	255.3782	17%

Source: based on survey results

At the same time, it was decided to ask respondents if they consider their sugar consumption as appropriate or not. According to the results, 48 people said that they consume sugar reasonable and 41 participants rather agree with this statement. Whereas only 9 people consider their consumption as inappropriate and rest of the respondents, (24 persons) slightly disagree. The graph below represents answers from different regions in Russia.

**Figure 14** If sugar consumption is appropriate

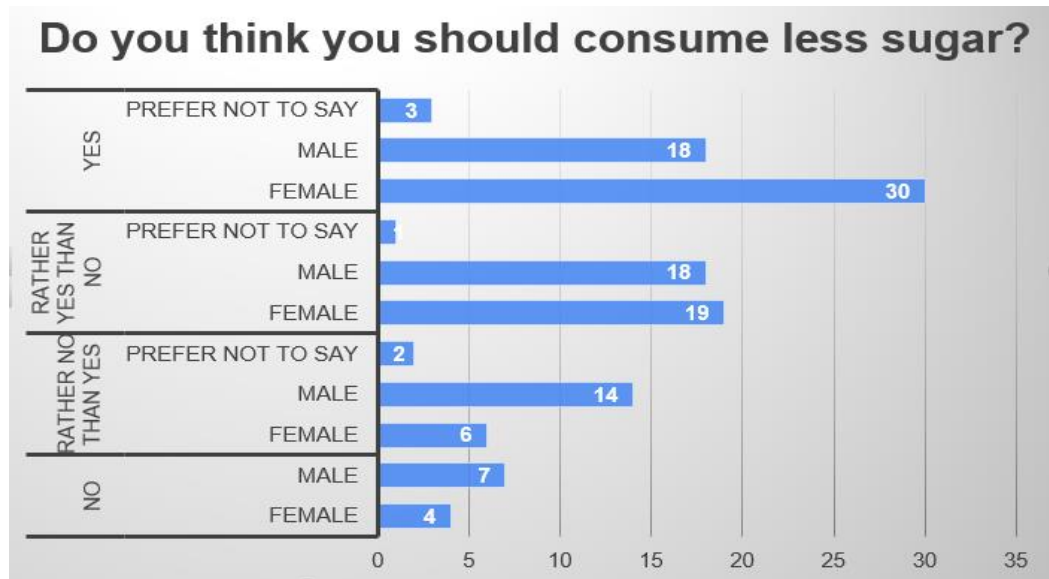


Source: based on survey results

The theoretical question if people should consume less sugar showed that women concern about this question more than men do. 24.5 % women out of all respondents and 50.8% out of all female participants definitely agree to decrease consumption. 15.6%

women among all respondents and 32.2% among female representatives slightly agree with given question. At the same time, only 14.75% men out of all respondents think that they should consume less sugar and 31% from all male participants. The answer “Rather yes than no” was given by 15% men out of all respondents and 31.5% from male participants.

**Figure 15 Do you think you should consume less sugar?**



Source: based on survey results

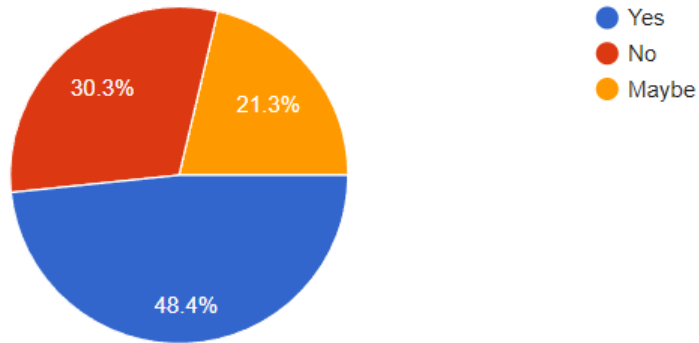
## 5.2 Health consideration

As it was mentioned in literature review, sugar influence on people health and it is a cause of many diseases, one of them is diabetic. According to performed survey, it was detected that 48.4% people have history of diabetic issues in their family and 21.3% do not know about it. Only 30.3% of respondents are sure that they do not have any diabetic issues. These results show that disease is common among respondents and they should be concerned about their health. In 2019, diabetes was the direct cause of 1.5 million deaths (Diabetes, 2022).

**Figure 16 History of diabetic issues**

Do you have any history of diabetic issues in your family?

122 responses



Source: based on survey results

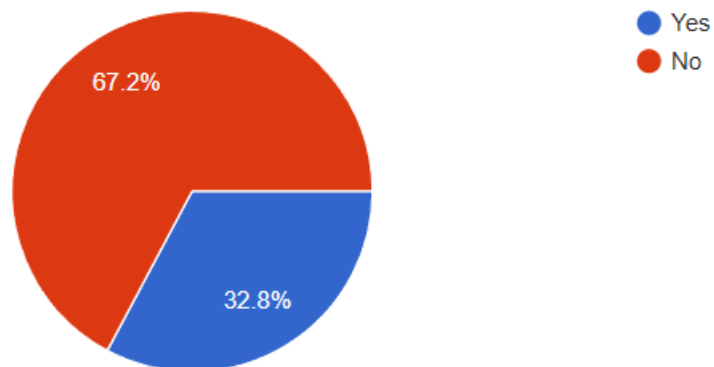
On the basis of the previous question it was decided to find out if people regularly check insulin level. Despite the history of diabetic issues, predominant majority people do not concern about insulin level. 67.2% of the respondents do not check it and only 32.8% care about it. According to WHO recommendations as long as person do not have diabetes, it is enough to check insulin once every six months or once a year.

Between 2000 and 2016, there was a 5% increase in premature deaths (i.e., under age 70) from diabetes (Diabetes, 2022).

**Figure 17 Insulin level**

Do you regularly check insulin levels?

122 responses



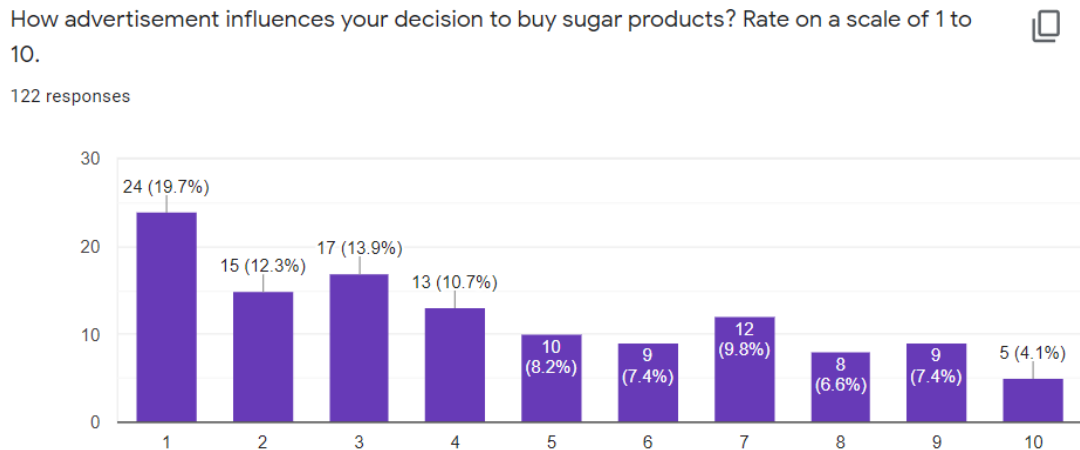
Source: based on survey results

### 5.3 Advertisement exposure in Russia

As it was analyzed in the literature review, the most vulnerable group in the advertisement exposure is children. However, this survey provides results in the age group more than 18 years old. According to the scale on the figure, 18 adults in Russia mostly are not affected by advertisement. However, some of them rated advertisement exposure equal to 10 (the highest value on the scale).

Researchers from Yale University analyzed 45 scientific publications that collected data on 3,300 different people and found that false feelings of hunger are indeed encouraged by food advertising (Akulinichev, 2022).

**Figure 18 Advertising exposure**



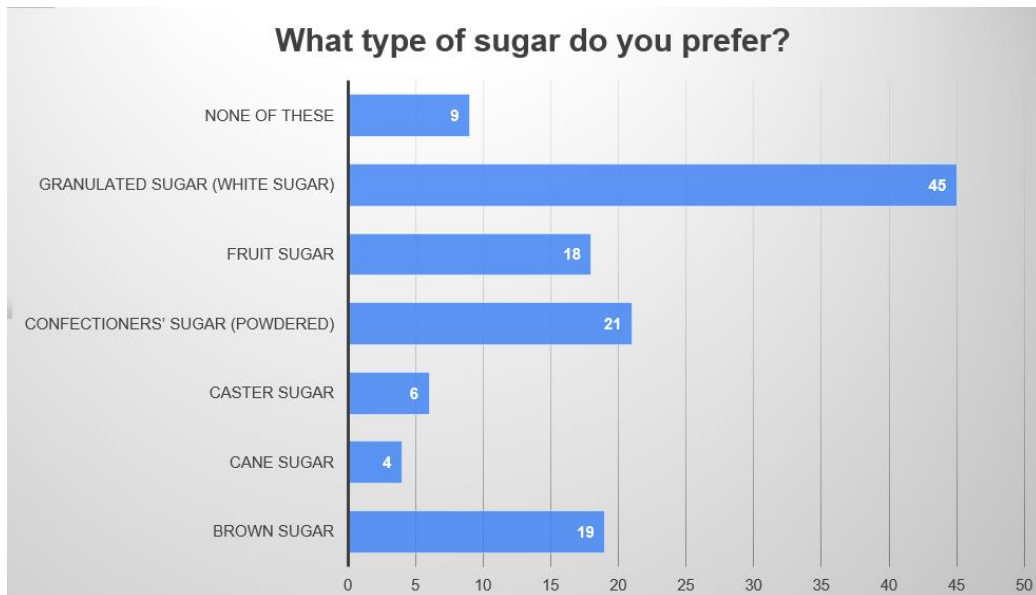
Source: based on survey results

### 5.4 The most popular type of sugar

Among selected regions in Russia there was detected the most popular type - granulated sugar. This sugar is used on a daily basis, as well as in most recipes and 36.9% respondents prefer it. The second type is confectioners' sugar – 17.21% selected it. The third type is brown sugar. The main differences between granulated and brown sugar are taste and color, because brown sugar contain less calories and 15.6% people prefer it. Almost the same popularity has fruit sugar; it is consumed by 14.7% of people. Caster and cane sugar are in minority – 5% and 3.2% respectively.



**Figure 19 What type of sugar do you prefer**



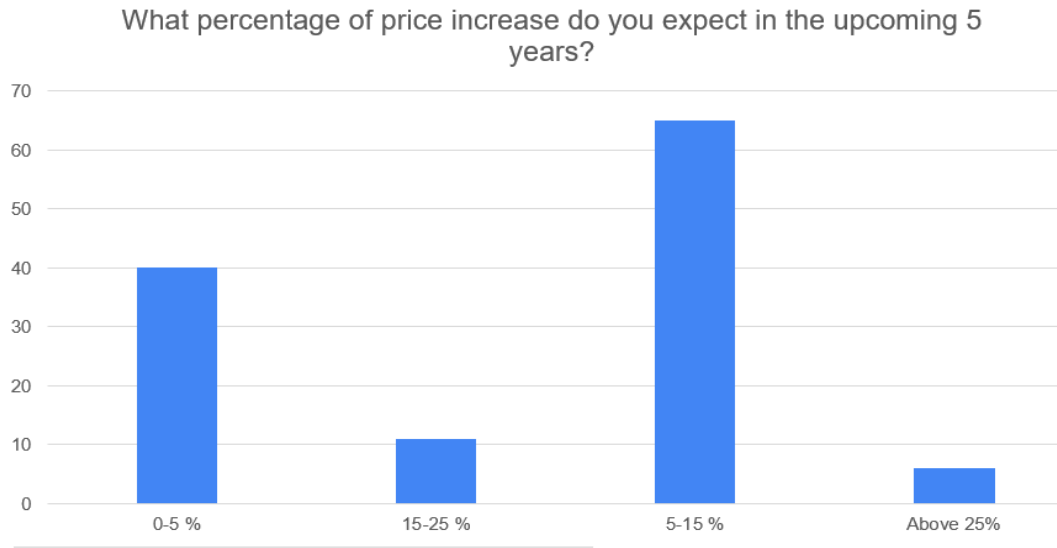
Source: based on survey results

## **5.5 Price expectations**

Most of the participants of the survey expect a price-increase of around 15-25% on sugar products in the upcoming 5 years. Forty people do not expect any increase or expect maximum 5%. Whereas 11 people expect an increase of about 15-25% and only six of the respondents have chosen above 25%. Overall, people do not expect significant changes in prices.

According to Russian news, wholesale sugar prices in the current season have the potential to grow in the range of 10% and may increase. The Ministry of Industry and Trade and the Ministry of Agriculture of Russia will no longer restrain the prices of sugar. The Ministry of Agriculture said that it does not plan to conclude price agreements with producers and retail chains (What products will become more expensive in Russia in 2022, 2022?).

**Figure 20 What percentage of price increase do you expect in the upcoming 5 years?**

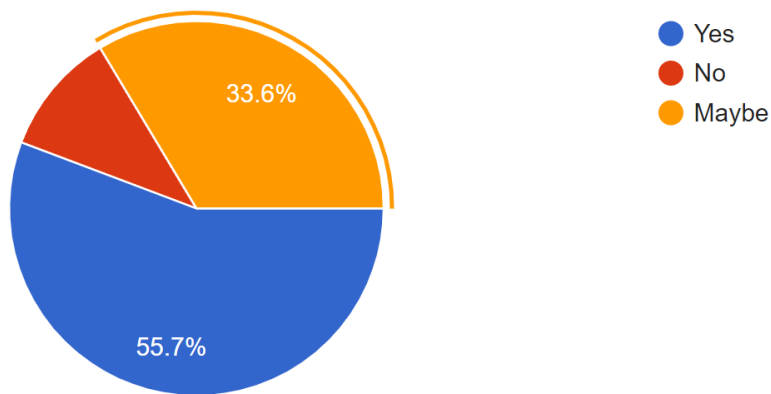


Source: based on survey results

### 5.5.1 Balance of Trade

The figure 21 represents theoretical question “If the price of sugar products increases will you still buy the same quantity?” among citizens of Russia. 55.7% gave positively answer and only 10.7% disagreed with this question. Whereas 33.6% of respondents have difficulties to answer. After this question, it was decided to calculate balance of trade (in sugar products) in the Russian Federation.

**Figure 21 If the price of sugar products increases will you still buy the same quantity?**



Source: based on survey results

According to the data from literature review author calculated the Balance of Trade. The Balance of Trade is the difference between the monetary value of a country's imports and exports over a given period. A positive trade balance indicates a trade surplus, while a negative trade balance indicates a trade deficit. In this formula - **Value of Exports** is the value of goods and services that are sold to buyers in other countries. **Value of Imports** is the value of goods and services that are bought from sellers in other countries (Balance of Trade -BOT, 2022).

**Balance of Trade Formula = Country's Exports – Country's Imports**

Balance of Trade in the Russian Federation (sugar import/export only) for 2020 year =  
 $178,578,659\$ - 174,531,562\$ = 4,047,097\$$

This calculation represent BOT as a positive number that means a trade surplus in sugar.

## **6 Conclusion**

The main point of this thesis is to analyze sugar consumption in different parts of the Russian Federation such as Moscow, Saint Petersburg, Stavropol Region, Rostov Region and Republic of Karelia. Along with the consumption, it was important to provide information how sugar effect people health. Another essential measurement was introduced as balance of trade in Russia of sugar products.

Analysis of the survey showed that citizens of Russia consume more sugar than they should according to WHO standards. The average Russian consumes sugar products almost 4 times higher than the norm. People consider sugar as very important product in their grocery basket and no matter which income they have they will not exclude sugar from their daily ration. At the same time, respondents of the survey do not expect significant changes in prices on sugar products in the upcoming 5 years.

The country has a strong position in the world beet sugar production, but due its large population, Russia has not always been able to meet the demand for sugar. Russia focused more on sugar as a domestic product since 2015, but still cannot provide enough amount for all regions and depends on some countries.

This work is significant as sugar production is a big part of the agricultural sector and it is an essential component for normalizing the activity of the central nervous system. In order to know how much sugar should be produced, it is important to analyze its consumption and demand of this product.

People all over the world started to consume sugar that their body needs. It is a big problem for health and future generation. People have to control their sugar consumption that could be managed with the reducing of the advertisement exposure. At the same time, Russia should focus on producing more sugar instead of importing in large numbers.

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## 8 Appendix

1. What is your current gender identity?
  - Male
  - Female
  - Prefer not to answer
2. What is your age group?
  - 18-24
  - 25-34
  - 35-50
  - Above 50
3. In which region of Russia do you live?
  - Moscow
  - Saint Petersburg
  - Stavropol Region
  - Rostov Region
  - Republic of Karelia
4. What is your income per month? (In euro).
5. Do you think your sugar consumption is appropriate?
  - Yes
  - Rather yes than no
  - Rather no than yes
  - No
6. What types of sugar do you prefer?
  - Granulated sugar (white sugar).
  - Caster sugar
  - Confectioners' sugar (powdered).
  - Brown sugar
  - Cane sugar
  - Fruit sugar
  - None of these



7. How many teaspoons do you add to your hot drinks?
- Don't add
  - 1-2
  - 2-4
  - More than 4
8. How many calories do you consume per day?
9. How many calories do you consume just from sugar products?
10. Do you prefer sugarless products than regular one?
- Yes, I prefer sugarless products
  - No, I prefer sugar products
  - It depends on a product
11. Do you think you should consume less sugar?
- Yes
  - Rather yes than no
  - Rather no than yes
  - No
12. How advertisement influences your decision to buy sugar products? Rate on a scale.
13. Do you have any history of diabetic issues in your family?
- Yes
  - No
  - I don't know
14. Do you regularly check insulin levels?
- Yes
  - No
15. How much money do you spend on sugar products every week? (In euro).
16. If the price of sugar products increases, will you still buy the same quantity?
- Yes
  - No, I will buy less sugar products

17. Do you think Russia should focus on producing more sugar instead of importing in large numbers?

- Yes
- No
- Maybe

18. What percentage of price increase do you expect in the upcoming 5 years?

- 0-5 %
- 5-15 %
- 15-25 %
- Above 25%