

## Digestive Status of the Population in Anthropogenic Impact

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### Abstract

This paper deals with an actual topic of the food habits of the population of a certain region, their financial costs for purchasing food, the conformity of the amount of food consumed to the norms of consumption of certain products, as a factor in the development of chronic non-infectious diseases. The relationship between unbalanced diet and inexorably increasing rates of diabetes, obesity and cardiovascular disease was defined in the middle of the last century. However, despite the full availability of information in the modern world and the ubiquitous propagation of a healthy lifestyle, the incidence figures speak of the lack of awareness of the population about the risk factors for health problems. We investigated one of the most important links in the prevention of chronic non-infectious diseases: the rationality of nutrition. The paper presents the methods and results of research of food habits of people of different age groups, and covers such aspects as the dependence between consumed food, financial well-being and the reasons for changing food habits (Mansurov and Kondratieva, 2017). The results of the study show a deficit in the consumption of almost all foods, especially in important segments such as plant products. The urban population does not have suitable conditions for growing vegetables and fruits, and the prices for food products are often too high for them in the appropriate amount. A small amount of meat, eggs and milk in the diet increases the risk of chronic non-infectious diseases, which raises the issue of addressing the problem of preventing deterioration in the health status of the population. This paper is a tactically important basis for developing a set of measures aimed at correcting food habits in terms of enriching the diet with vitamins, minerals and the necessary amount of proteins and carbohydrates.

**Keywords:** Dietary habits; Chronic non-infectious diseases; Risk factor; Food products; Rationality of nutrition.



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### 1. Introduction

This study considers the current problem of the relationship between people's dietary habits, their financial costs for the purchase of food, the norms of consumption of certain products and the emergence of chronic non-infectious diseases.

Already in the 60s of the XX century, the concept of risk factors for the development of chronic non-infectious diseases (CNID) was developed, including cardiovascular pathologies, obesity and diabetes mellitus common in Russia. According to this concept, risk factors are divided into unmodified and modifiable. Modifiable risk factors can be corrected, among them are hypodynamia, smoking, alcohol consumption, malnutrition - the most common behavioral risk factors in the life style of modern society that cause the emergence of CNID (Pomeranz, 2011).

Based on the above, the authors of this paper concluded that it is necessary to investigate the spread among the population of one of the main risk factors, namely unhealthy diets, understand its role in the development of cardiovascular pathology, obesity and diabetes, and take steps to develop the world view of a healthy lifestyle in the population.

## 2. Methods

The study was conducted among the population of a large industrial city. The information was collected using a personal interview and questionnaire. The sample size was 1200 people. Using methods of statistics that take

In to account age and income, two groups were identified:

- 1) the dependence of costs for food on income;
- 2) the dependence of consumption of specific products on age.

## 3. Results

Analysis of the first group showed that the highest share of costs for food products is found in a group with an income of over 7,000 rubles per person, so more than 50% of the income of 31.5% of respondents is spent on food. A significant share of food products is in the consumer basket for people with income of 5,000-7,000 rubles, 23.6% of respondents spend more than half of their earnings on food. In low-income people, the share of products ranges from 30% to 50%.

The main reasons for changing dietary habits in all groups is the lack of funds (59.4%) and the desire to keep a healthier lifestyle (27.4%), especially lack of money in the group with an income of 5000-7000 rubles per person in the family, having income over 7000 rubles change their eating habits, being guided by the desire to lead a healthy lifestyle

Experts of the Institute of Nutrition of the Academy of Medical Sciences of the Russian Federation calculated approximate norms for the consumption of food products: the adult's needs per month: meat (including poultry and lard) - 6.8 kg; milk - 34.5 liters; eggs - 24 pieces; fish and seafood - 1.8 kg; vegetable oils - 0.75 liters; sugar - 3.3 kg; potatoes - 8 kg; vegetables and melons - 12.2 kg; fruit and berries - 9.5 kg (Greshonkov and Merkulova, 2014).

Analysis of the second group showed that the consumption of grain products increases with the age category, starting from 1.6 kg for one-year-old children, and the maximum amount of bread per month is consumed by people aged 51 to 59, an average of 5.85 kg, which is 100 - 800 grams is significantly higher than other categories of adults. This consumption is practically independent of the season. On average, the peak consumption of grain products reaches in winter and is 5.2 kg per month, the least in the summer - 4,096 kg. The share of locally produced grain products is about 58% ( $P < 0.05$ ).

Consumption of dairy products in children and youth under 20 years varies from 2.5 to 3.9 kg per month, milk consumption in children and adolescents aged 10 to 19 years is about 1.9 kg per month. In the remaining age groups, consumption is significantly increased by almost 2 to 2.5 times. The most consumed age groups are 50-59 years old, 60 and older, this manifests itself practically in all seasons and reaches a maximum in winter - 8.9 kg for the group 50-59. In winter, the average consumption for all groups remains the highest at 7.4 kg, and the least demand for dairy products in the summer, reduced to 5.9 kg. The share of domestic dairy products varies on average from 82% (winter) to 86% (spring), and is only 79% in autumn ( $P < 0.005$ ).

The consumption of butter tends to increase with the age of the group, the least is the group of 2 years of age, and the maximum is achieved in the group of 50-59 years in winter - 0.534 kg. Also winter is when the highest average consumption can be observed - 0.44 kg, in summer there is a minimum of 0.41 kg. In the consumption of butter, the share of domestic products is extremely low, ranging from 1 to 3%, and most age groups do not consume local food.

With the increase in the age group, the consumption of eggs per month also increases from 5.4 in children of two years to 18.0 in the group of 60 and older. The highest indices in the group of 60 and older in the autumn are 18.08 eggs, however, the average maximum is reached in winter - 15.5 eggs, which is due to the increase in the amount of consumption in other groups. The minimum is observed in summer, when on average 13.9 eggs are consumed. Basically, these are eggs of local origin, the share of imported product averages 5.5% ( $P < 0.0001$ ). Some groups consume products of local origin only. The consumption of meat products increases with each subsequent group, starting from 1.3 kg in children of 1 year old, reaching a maximum in people of 40-59 years old, and then somewhat lowering. The group of 40-49 years old consumes the most in winter - 6.1 kg, the average consumption is also maximum in this season - 5.2 kg, minimum in summer - 3.8 kg. The share of locally produced foods in the diet of respondents is about 55% in the adult population, 30% in adolescents and approaching 95% in children ( $P < 0.05$ ).

With aging, the number of fish products consumed also steadily increases, starting from 0.63 kg for one-year-old children, reaching the highest point of consumption in the group of 40-49 years old. Summer is the peak of consumption, about 2.4 kg per person per month in the group of 41-50 years old, the average consumption is maximum - 2.1 kg. The children are less likely to consume fish products in spring, but the minimum average consumption is in autumn - 1.347 kg. On average, the share of products of local origin is about 55%. However, least of all fish products of local origin are consumed by children under 6 years old, on average about 1-5% ( $P < 0.05$ ).

The consumption of potatoes increases evenly with the age of the group, starting with the minimum value in children of 1 year old and reaching its maximum in the group of 40-49 years old. In this group, the maximum consumption is in autumn - 5.4 kg, the average consumption in this season is the highest - 4.6 kg. The least potatoes are consumed by children of 1 year old in spring, when the minimum average value is also observed - 3.162 kg. If children under 5 years consume potatoes of exclusively local origin, then the share of local potatoes in the adolescents' diet makes up about 30%, on average the share of local foods in the diet is about 85% ( $P < 0.005$ ).

Children and adolescents under 15 years do not show a significant difference in the amount of vegetables consumed - about 1.7 to 1.8 kg, only in children from 6 to 15 years old in summer and spring the consumption of vegetables sharply increases, by about 55%, which is explained by the beginning of a season and increased

availability of vegetables. In summer and autumn the share sharply increase in other age groups too on average by 70%. In spring and winter, groups of 40-49 years old consume the most amount - 3.6 kg, and in summer and autumn - 5.7 kg. Peak consumption of vegetables in all groups falls on autumn, an average of about 4.9 kg. On average, vegetables of local origin range from 63% in winter to 89% in autumn.

Consumption of berries is subject to seasonal fluctuations: if in summer, spring and autumn, children under 5 years old consumed more than 2 kg of mainly local origin, while in winter - imported only. People 20 to 49 years old consume reliably more berries and fruits - over 4 kg per month, and only in winter and spring their diet consists of mainly imported products.

## 4. Discussion

We have considered the actual problem of the dependence of development of chronic non-infectious diseases on food habits, as well as consumption of specific products depending on age and income. We conducted a survey interviewing the population, analyzed the data and obtained quantitative indicators of the dependence of consumption of specific food products on the age and season of the year, and the dependence of costs for food products on the income of the population (Shevkunova, 2014).

Thanks to the statistical methods of analysis, we see that:

1. the percentage of expenditure on food products increases along with increasing income of residents;
2. deficiency of milk consumption is 25% of the norm;
3. deficiency of egg consumption is 35% of the norm;
4. deficiency of vegetable consumption is related to climatic features;
5. indicators of consumption of meat products, as well as fish are normal.

Consequently, we can state that there is a deficiency of consumption of almost all types of products, which is primarily related to the income of residents and their age, as well as food habits and climatic features (local production).

## 5. Summary

According to experts, approximately 55 percent of people over 30 years old in our country have an overweight. Unbalanced diet leads to chronic shortage of many important for health bioactive compounds - vitamins, microelements, biologically active substances (Oberleas, 2003; Zabodalova *et al.*, 2009).

In the survey, the respondents of the first group were divided into three categories, depending on their income:

With an income of up to 4000 rubles per person, the share of products in consumption ranges from 30 to 50%;

With an income of 5000 to 7000 rubles only 23.6% spend up to half of their earnings on food;

The category of respondents with an increased level of income (over 7,000 rubles) was 31%, and spent on products half of their earnings.

In general, residents of a large industrial city spend about 30 to 50% of their income on food. The bulk of consumers have stable eating habits (75%), and those who change them are guided primarily by the lack of funds (59.4%) and the desire to keep a healthier lifestyle (27.4%).

In this study, we analyzed the consumption of key food products depending on age (group 2):

Grain products are consumed most often in winter by people aged 50 to 59 years, the average amount of this product is 5.85 kg (58% - local production);

The group of 50-59 years old consumes most of the dairy products together with people older than 60, the maximum amount among other groups is in winter only – 8.983 kg (82% - local production). Comparing the approximate norms of milk consumption, we can visually note the deficiency or non-equilibrium of its consumption;

The consumption of butter tends to increase with the age of the group: the minimum is a group of 2 years of age, the maximum is the group of 50-59 years old in winter - 0,534 kg (1-3% - local production). Butter - 0.534 kg with an average consumption of 0.4429 kg.

The group over 60 years old is the leader in egg consumption - 18.08 in autumn only, while the average maximum is reached in winter - 15.59, and minimum – in summer - 13.957 eggs (85-90% - local production). The consumption of eggs does not reach the norm by 25% even at their maximum consumption in winter, and average consumption - by 35%.

The maximum meat consumption is reached in winter in people aged 40 to 49 years - 6.129 kg, which is above the average (5.211 kg), while the minimum falls on summer– 3.865 kg. The share of products of local origin in the diet of respondents is about 55% in the adult population, 30% in adolescents, and children under 5 years of age consume mainly local products (95%). Consumption of meat products is approaching the norm, low summer indices, probably, indicate an increase in the share of consumption of vegetables and fruits. It should be noted that consumption of milk, bread, butter, eggs, meat is the highest in winter, and the lowest in summer.

The fish season falls on the summer period, the consumption reaches its maximum in the group of 40-49 years old - about 2.286 kg, with an average of 2.165 kg, but the minimum average consumption is in autumn - 1.347 kg (55% - local production). In general, we should note good indicators of consumption of fish products, which are higher than normal.

Also, the group of 40-49 years consumes the most potatoes in autumn - about 5.424 kg, with an average of 4.663 kg in the same season (the share of local potatoes is 85%).

The consumption of vegetables in summer and autumn significantly increases by approximately 70% in all groups, reaching its maximum at the age of 40 to 49 years - 5.729 kg, with an average of 4.972 kg. In spring and

winter, the most consumed groups are 41-50 - 3.641 kg, and in summer and autumn - 5.729. On average, vegetables of local origin range from 63% in winter to 89% in autumn. The deficiency of vegetables and melons is explained by the peculiarity of the climate, as well as by their high cost. Consumption of berries is subject to seasonal fluctuations: if in summer, spring and autumn, children under 5 years old consumed more than 2 kg of mainly local origin, while in winter - imported only.

People 20 to 49 years old consume reliably more berries and fruits - over 4 kg per month, and only in winter and spring their diet consists of mainly imported products.

Berries and fruits, as well as vegetables, are relatively expensive products compared to other, and, respectively, make a smaller part of the diet of residents of the studied areas (Shamberger, 1985).

Fish, vegetables and fruits are most consumed by residents between the ages of 40 and 49 in summer and autumn; a significant share of these products is imported (Tahavieva and Nigmatullina, 2017).

## 6. Conclusion

Summarizing all the results of the research, it should be noted that there is a clear deficiency of consumption of almost all products, especially in such important segments as vegetables and fruits. The urban population is often not ready or has no opportunity to grow vegetable products with their own hands, and their price on the market grows every day. Low consumption of meat, eggs and milk raises questions about the quality of health of the residents of the district and the need to take measures to increase consumption of foods enriched with vitamins, minerals, essential proteins and carbohydrates (Akleyev *et al.*, 2002; Babich *et al.*, 1985).

## Acknowledgements

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

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