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The Formation of the Criteria, Rules and Regulations of the Sufficient and High-Quality Food According to the European Standards

Abstract. Introduction. Modern food systems face the challenge of supporting food choices that are consistent with a healthy and adequate diet. The vast majority of consumers of food products do not choose the principle of quality – the choice is made in favor of lower cost (low nutrient content), readiness of the product for consumption (high processing and trans fat content) or taste (high sugar, salt, etc.). At the same time, poor nutrition around the world is the number one risk factor for death and disability.

Purpose. To study the criteria of the sufficient and high-quality food based on the norms and standards according to the European standards at different levels.

Results. The article examines the indicators of calorie consumption per capita, daily calorie reserve per person, the minimum daily calorie requirement, inequality in calorie consumption per capita in the world. The key drivers of the impact of the level of nutrition on the quality of life have been identified: a healthy diet; unhealthy diet and lack of physical activity are the main global health risks, especially obesity; breastfeeding; balanced energy consumption; restriction of sugar consumption (up to 10%) and salt (up to 5 g per day). The WHO data and recommendations on ensuring a healthy diet for adults and children are summarized. The effective actions of politicians to create a healthy food environment have been identified, which should include three interrelated areas: building coherence in national policies and investment plans, including trade, food and agricultural policies; encouraging consumer demand for healthy food; promoting appropriate feeding practices for infants and young children; and tools for their implementation at the national level were systematized. WHO's healthy eating policies and programs for national governments and related healthy eating policies and programs in Ukraine were described.

Conclusions. A healthy diet from birth and throughout life prevents malnutrition in all its forms, as well as a number of non-communicable diseases. However, increased production and consumption of processed foods, rapid urbanization and lifestyle changes have led to changes in diets. People now consume significantly more foods high in energy, fat, sugar and salt / sodium. At the same time many people do not consume enough fruits, vegetables and whole grains, which contain the necessary fiber, vitamins and minerals for the human body. The required content of a varied, balanced and healthy diet varies depending on individual characteristics (age, gender, lifestyle and level of physical activity), cultural context, local products and eating habits. Along with this the basic principles of healthy nutrition remain unchanged.

Keywords: criterion; policy; standard; healthy nutrition; WHO; European experience.

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Формування критеріїв, норм й нормативів достатнього та якісного харчування за європейськими стандартами

У статті досліджено показники споживання калорій на душу населення, добовий запас калорій на людину, мінімальна добова потреба в калоріях, нерівність у споживанні калорій на душу населення у світовому виміру. Визначено ключові драйвери впливу рівня харчування на якість життя: здорова дієта; нездорове харчування та недостатня фізична активність як основний глобальний ризик для здоров'я, особливо ожиріння; грудне вигодовування; збалансоване споживання енергії; обмеження споживання вільного цукру (до 10%) та солі (до 5 г на добу). Узагальнено дані та рекомендації ВООЗ щодо забезпечення здорового раціону для дорослих та дітей. Визначено ефективні дії політиків щодо створення здорового харчового середовища, які мають включати три взаємопов'язані напрями: створення узгодженості в національній політиці та інвестиційних планах, включаючи торговельну, продовольчу та сільськогосподарську політику; заохочення споживчого попиту на здорову їжу; пропагування відповідних практик годування немовлят і дітей раннього віку; та систематизовано інструменти їх реалізації на національному рівні. Описано політики та програми ВООЗ щодо здорового харчування для національних урядів та відповідні політики та програми щодо здорового харчування в Україні.

Ключові слова: критерій; політика; норматив; здорове харчування; ВООЗ; європейський досвід.

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Formulation of the problem. Modern food systems face the challenge of supporting food choices that are consistent with a healthy and adequate diet. The vast majority of consumers of food products do not choose the principle of quality – the choice is made in favor of lower cost (low nutrient content), readiness of the product for consumption (high processing and trans fat content) or taste (high sugar, salt, etc.). At the same time, poor nutrition around the world is the number one risk factor for death and disability. Foods that do not provide a healthy diet are increasingly recognized as the main cause of malnutrition, which, regardless of form, causes significant losses: the economic losses associated with malnutrition are estimated at 1-2 trillion US dollars per year, which is about 2-3% of world GDP; the global economic cost of obesity and malnutrition and non-communicable diseases is estimated at \$2 trillion per year, or about 2.8% of world GDP.

Against the background of such challenges, there are growing calls for reforms of the food system to provide safe, varied, nutrient-rich foods in sufficient quantities to everyone and everywhere. The urgency of the action proposals is reinforced by rapid population growth, climate change and urbanization, which will put increasing pressure on food systems over the next 20 years.

Analysis of recent research and publications. Analysis of scientific research and publications by domestic scientists has identified two significant problems.

First, Ukrainian scholars use the word «nutrition» exclusively in the context of health care: if in the system of the National Library of Ukraine named after V.I. Vernadsky search for scientific publications to specify the keywords «nutrition» and «European» we will receive no more than two dozen articles and they all describe the European experience of nutrition in health care. You can only search for the word «food».

Secondly, the achievements of domestic scientists in the implementation of European experience in food security are very small. Thus, searches in the system by keywords «food» and «European» provides less than ten publications on regulatory issues [1, 2], European integration [3, 4, 5], government regulation [6, 7, 8] and landuse [9].

We understand that indeed the list of works is much wider, but another question arises – the correct wording of the titles of articles, which would allow them to be

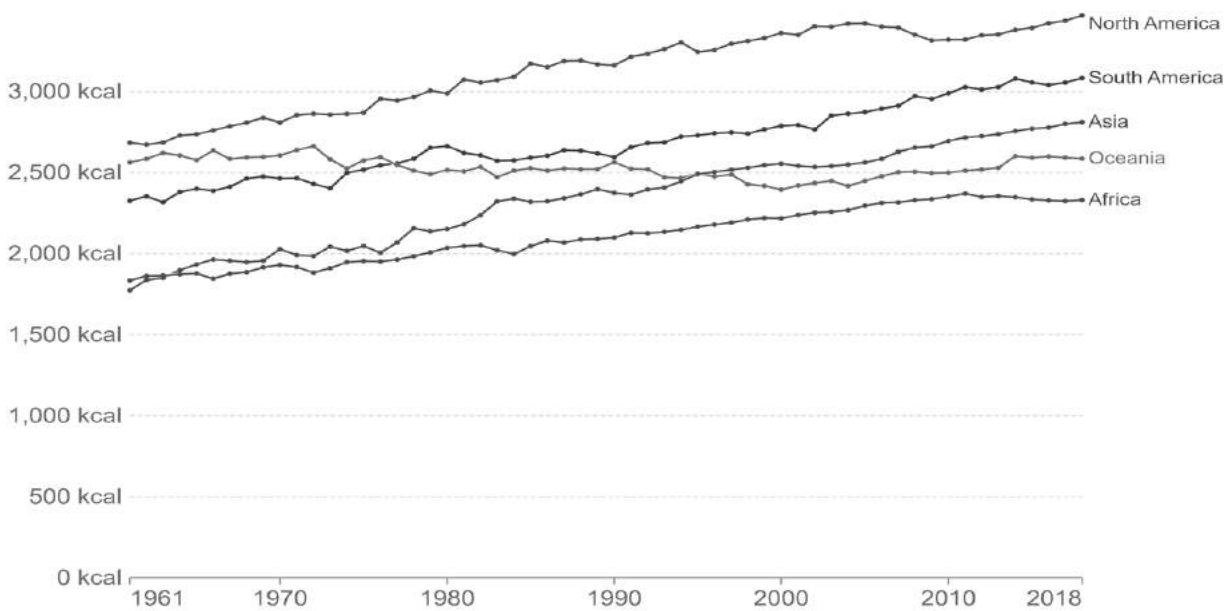
quickly identified and used in further research. For example, in the dissertation we have developed the methodological basis for the formation of criteria for appropriate levels of food security [10, p. 103-119] and proposed a system of indicators and marginal levels of food security [10, p. 119-146]. At the same time, in the domestic scientific achievements there are no thorough meaningful works of theoretical and methodological direction on the system of criteria of sufficient and quality nutrition on the basis of norms and standards according to European standards at different levels.

Formulation of research goals. To study the criteria of the sufficient and high-quality food based on the norms and standards according to the European standards at different levels.

Outline of the main research material. The main indicator of the level of nutrition in Ukraine for many years remained the rate of calorie consumption per capita. This approach has previously been used by other developed countries, but as the caloric indicator approaches certain levels (Figure 1) – they differ slightly in each country – the European community has concluded that over the past few decades, global trends in calories in different countries, including Asia and Africa, are approaching target and today, in terms of food supply, we live in a more equal world than in the previous century, and the number of calories consumed does not reflect the state of affairs regarding the quality and availability of food.

Currently, the world map of calorie distribution does not show significant differences: almost all over the planet the number of calories available for consumption is from 2000 (Fig. 2).

To confirm this thesis, we present data on the minimum daily caloric needs in the world in 2020 (Fig. 3). The data on the map are different because people's energy needs vary depending on gender and age, as well as physical activity. Accordingly, the minimum dietary energy requirement (MDER) is the amount of energy required for low activity and reaching the minimum allowable weight for a certain age, which vary from year to year depending on the country, gender and age structure of the population. Thus, countries with very young populations may have lower MDER values on average, as children's energy needs tend to be lower than adults'. Similarly, countries with more active populations (for example, high energy costs for agricultural work) will have higher MDER levels.



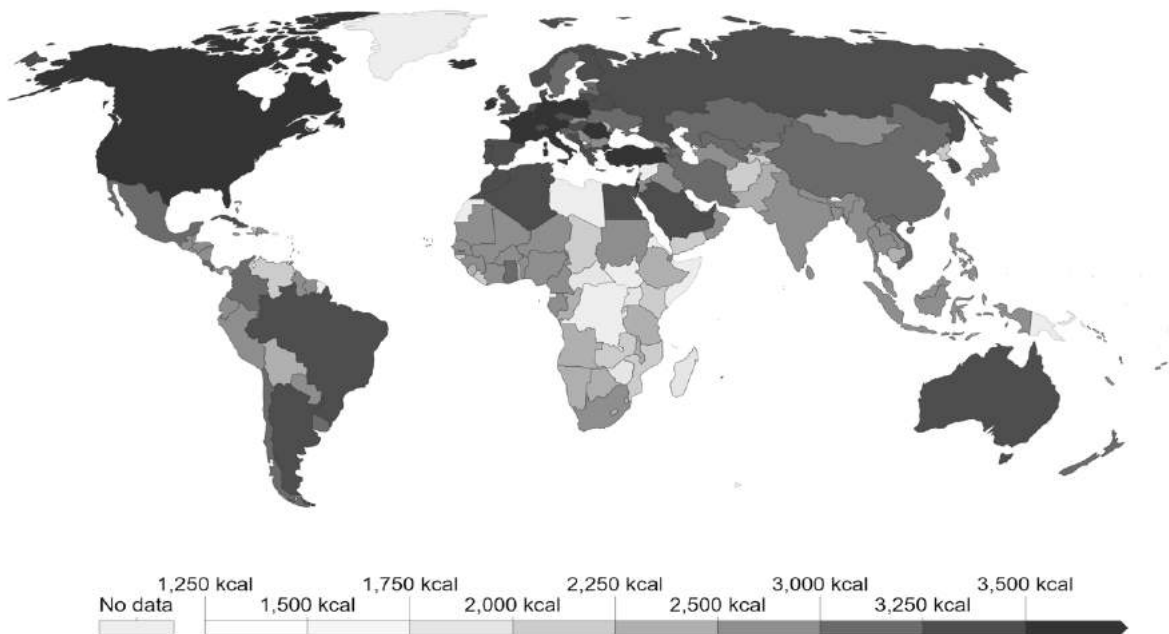
Source: Our World in Data based on the UN FAO & historical sources

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Figure 1 – Daily supply of calories per person, 1961 to 2018

Note: Daily per capita caloric supply is measured in kilocalories per person per day. This indicates the caloric availability delivered to households but does not necessarily indicate the number of calories actually consumed

Source: generated by the author



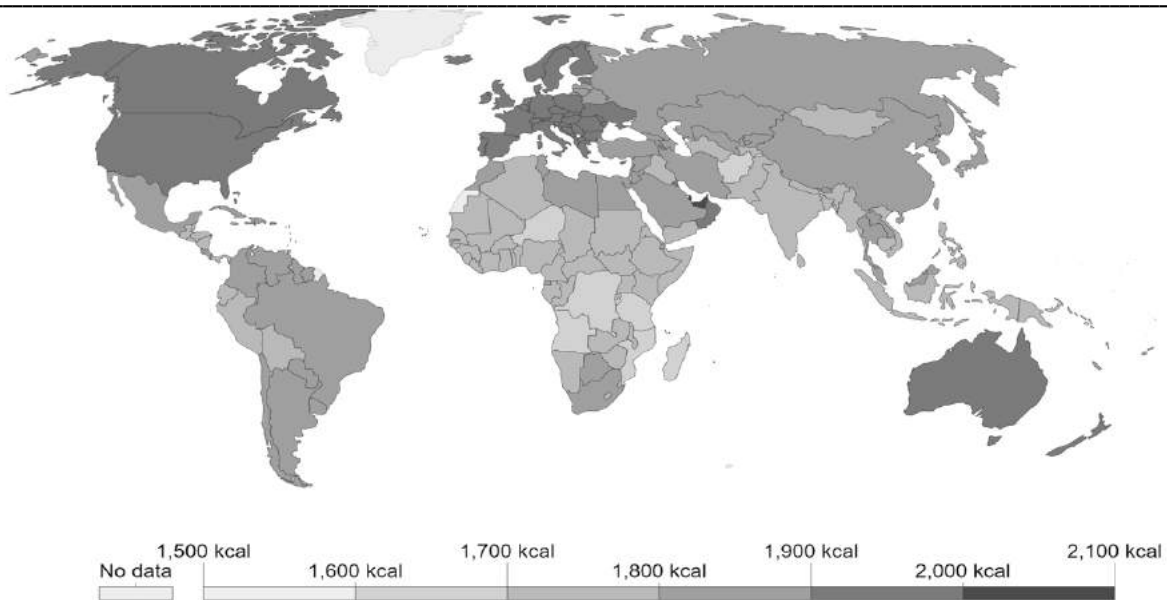
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Figure 2 – Daily supply of calories per person, 2018

Note: Daily per capita caloric supply is measured in kilocalories per person per day. This indicates the caloric availability delivered to households but does not necessarily indicate the number of calories actually consumed

Source: generated by the author



Source: Food and Agriculture Organization of the United Nations

OurWorldInData.org/hunger-and-undernourishment • CC BY

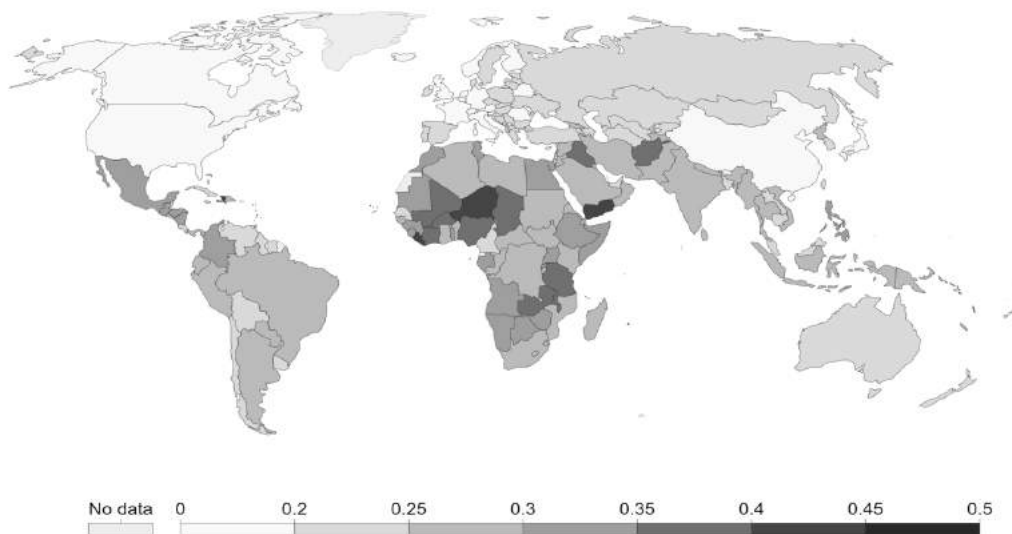
Figure 3 – Minimum daily requirement of calories, 2020

Note: The minimum amount of daily dietary energy per person that is considered adequate to ensure they maintain a minimum weight for health. Across a population, this takes factors such as the age, sex, height, and activity levels of different individuals into account

Source: generated by the author

In order to determine the inequality of calorie consumption in a given country, the Coefficient of variation of habitual caloric consumption distribution (CV) is used. This indicator is measured on a scale from zero to one, with an increase in the indicator represents larger levels of dietary inequality. Thus, the value of CV = 0.1 indicates

equal opportunities for the population to consume approximately the same number of calories. Instead, the value of CV = 0.5 shows a significant inequality in the diet of the population of one country.



Source: Food and Agriculture Organization of the United Nations

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Figure 4 – Inequality in per capita calorie intake, 2020

Note: The inequality in dietary calorie intake is measured as the coefficient of variation (CV) of energy intake. It represents the spread of intakes around the mean. Higher CV values represent larger levels of dietary inequality

Source: generated by the author

A healthy diet provides adequate nutrition and thus protects against non-communicable diseases, including diabetes, heart disease, stroke and cancer.

Malnutrition and lack of physical activity are major global health risks, especially obesity. Obesity is one of the biggest health problems in the world, evolving from a rich country problem to one in different countries and people with different income levels problem, which causes the premature deaths of 4.7 million people each year.

Healthy nutrition starts at an early age - breastfeeding promotes healthy growth and improves cognitive development, as well as long-term health benefits such as reducing the risk of gaining weight or obesity and developing non-communicable diseases throughout life

Energy consumption (calories) should be balanced according to energy expenditure. To avoid excess weight, fat intake should not exceed 30% of total energy intake (calories). Consumption of saturated fats should be less than 10% of total energy consumption, and consumption of trans fats - less than 1%, with fat consumption moving from saturated fats and trans fats to unsaturated, with the subsequent elimination of industrially produced trans fats

A necessary component of a healthy diet is to limit the consumption of free sugar to 10% of total energy consumption. Reduced to 5% of total energy consumption will significantly improve health.

Salt intake of up to 5 g per day (equivalent to up to 2 g of sodium per day) helps prevent hypertension and reduce the risk of heart disease and stroke in adults. WHO member states have agreed to reduce world salt consumption by 30% by 2025; they also agreed to work to reduce the incidence of diabetes and obesity among adults and adolescents and overweight children.

Figure 5 – The content of key drivers of level of impact of nutrition on quality of life

Source: summarized according to FAO and WHO

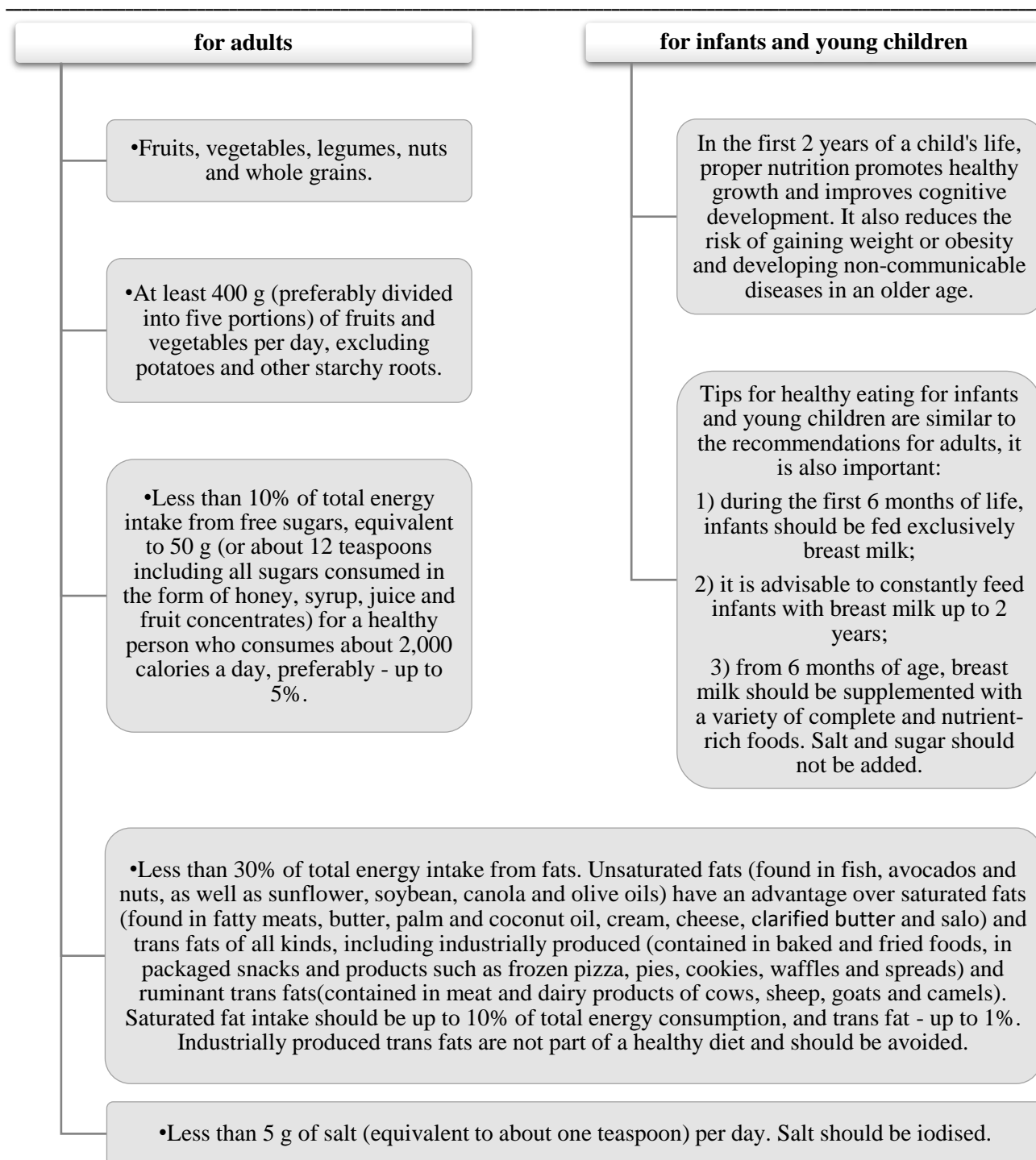


Figure 6 – A healthy diet recommended by WHO for adults and children

Source: summarized according to FAO and WHO

According to the Food and Agriculture Organization of the United Nations, the highest CV rate of 0.41 is observed in Nigeria, Liberia and Yemen (Figure 4). In general, the largest differences in CV in the global dimension are observed in South America and Africa, but they do not exceed 0.4.

Thus, it is obvious that the indicator of the number of available and consumed calories is not a sufficiently

reliable and relevant indicator of provision of the population with sufficient and quality nutrition level.

In order to establish such criteria for standards, it is necessary to identify key drivers: their content and the level of impact of nutrition on quality of life (Fig. 5).

According to the WHO proposal, a healthy diet is divided into two categories of the population: 1) infants and young children; 2) adults. Based on these drivers, a healthy diet should include fruits and

vegetables while reducing the consumption of sodium, free sugar, fats in general and saturated and trans fats in particular (Fig. 6).

Traditionally, the vast majority of Ukrainians believe that the transition to a healthy diet is quite

expensive, but this is another myth that has nothing to do with reality. Recommendations for ensuring a healthy diet are simple, do not require special skills or additional costs (Fig. 7).

Increasing the consumption of fruits and vegetables

- always include vegetables in food;
- eat fresh fruits and raw vegetables as snacks;
- eat fresh seasonal fruits and vegetables;
- eat a variety of vegetables and fruits.

Reduction of fats, especially saturated and industrially produced trans fats consumption

- steaming or boiling instead of frying;
- replacement of butter, сало and clarified butter with oils rich in polyunsaturated fats, such as soybean, canola (rapeseed), corn, safflower and sunflower oils;
- eating low-fat dairy products and lean meats or cutting off visible fat from meat;
- limit the consumption of baked and fried foods, as well as packaged snacks and foods (such as donuts, cakes, pies, cookies and waffles) that contain industrially produced trans fats.

Reduction of salt consumption

- restriction / absence of salt and spices high in sodium (eg soy sauce, fish sauce and broth) during cooking;
- restriction of salty snacks consumption;
- choosing among foods in favor of those with less sodium.

Reduction of sugar consumption

- restriction of foods and beverages consumption containing large amounts of sugars, such as: sweet snacks, sweets and sweetened beverages (carbonated or non-carbonated soft drinks, fruit or vegetable juices and beverages, liquid and powder concentrates, flavored water, energy and sports drinks, ready-to-drink tea, ready-to-drink coffee and flavored milk drinks);
- eat fresh fruits and raw vegetables instead of sweet snacks.

Figure 7 – Recommendations for ensuring a healthy diet

Source: summarized according to FAO and WHO

Changes in diet are quite slow under the influence of social, historical and economic factors, as well as traditions and rules that interact in a complex way, forming individual consumer diets. These factors include income, food prices (which will affect the availability of healthy food), individual beliefs, cultural traditions, and geographical and environmental aspects (including climate change). Thus, promoting a healthy diet, including food systems, requires the involvement of various sectors and stakeholders, including government, public and private sectors.

Governments play a central role in creating a healthy food environment that enables people to adopt and maintain healthy diets. Effective actions of politicians to create a healthy food environment should include three interrelated areas: creating coherence in national policies and investment plans, including trade, food and agricultural policies (Fig. 8); promotion of appropriate feeding practices for infants and young children (Fig. 9); encouraging consumers' demand for healthy food (Fig. 10).

strengthening incentives for producers and retailers to grow and sell fresh fruits and vegetables

reduce incentives for the food industry to continue producing processed foods high in saturated fats, trans fats, free sugar and salt / sodium

encouraging the processing of foods low in saturated fat, trans fats, free sugars and salt / sodium to eliminate industrially produced trans fats

implementation of WHO recommendations on the marketing of food and soft drinks for children

setting standards to promote healthy eating by ensuring the availability of healthy, nutritious and safe food in preschools, schools, other public institutions and at the workplace

studying the regulatory and voluntary instruments, as well as economic incentives or barriers to the promotion of healthy eating

encourage transnational, national and local catering establishments to improve the nutritional quality of their food and review portion sizes and prices

Figure 8 – Coherence tools in national policies and investment plans

Source: summarized according to FAO and WHO

implementation of the International Code of Marketing of Breast-milk Substitutes and subsequent relevant resolutions of the World Health Assembly

implementation of policies and practices to promote the protection of working mothers

promoting, protecting and supporting breastfeeding in health and community services

Figure 9 – Tools to promote appropriate feeding practices for infants and young children

Source: summarized according to FAO and WHO

promoting consumer awareness of healthy eating

developing school policies and programs that encourage children to adopt and maintain healthy eating

teaching children, adolescents and adults the rules of healthy eating

promoting culinary skills, including in children through schools

food labeling that provides accurate, standardized and understandable information on the content of nutrients in food

providing advice on healthy eating and dietary nutrition in primary health care facilities

Figure 10 – **Tools to stimulate consumer demand for healthy food**

Source: summarized according to FAO and WHO

At the transnational level the FAO and WHO are the main organizations that develop healthy nutrition policies and promote their further implementation at the national levels. Since 2004, the WHO has developed the necessary policies and organized a number of measures for their dissemination and implementation by national governments around the world (Fig. 11).

The WHO Global Strategy on Diet, Physical Activity and Health was adopted in 2004 by the Health Assembly. The strategy called on governments, WHO, international partners, the private sector and civil society to take action at the global, regional and local levels to promote healthy eating and physical activity.

In 2010, the Health Assembly approved a series of recommendations for the marketing of food and soft drinks for children. These guidelines guide countries to develop new policies and improve existing ones to reduce the impact of marketing on children. WHO has also developed regional-specific tools that countries can use to implement marketing recommendations.

In 2012, the Health Assembly adopted a “Comprehensive Plan for the Implementation of Maternal, Infant and Young Child Nutrition” and six global nutrition goals to be achieved by 2025, including reducing growth retardation, depletion, overweight in children, and improving breastfeeding and reduction of anemia and low birth weight

In 2013, the Health Assembly agreed on nine global voluntary targets for the prevention and control of non-communicable diseases. These goals include reducing the incidence of diabetes and obesity, as well as reducing salt consumption in 2025 by 30%

As infant and child obesity is on the rise in many countries, the WHO established a Commission to End Childhood Obesity in May 2014. In 2016, the Commission proposed a set of recommendations for successfully tackling childhood and adolescent obesity in a variety of contexts around the world.

In November 2014, WHO, together with FAO, organized the Second International Conference on Nutrition (ICN2). ICN2 has adopted the Rome Declaration on Nutrition and the Framework for Action, which recommends policies and strategies to promote a varied, safe and healthy diet at all stages of life. WHO is helping countries meet their ICN2 commitments

In May 2018, the Health Assembly approved the 13th General Program of Work (GPW13), which will be managed by the WHO in 2019-2023. To support Member States in taking the necessary measures to reduce salt / sodium consumption and eliminate industrially produced trans fats from food, the WHO has developed a roadmap for countries - set of actions REPLACE

Figure 11 – **WHO policies and programs on healthy nutrition**

Source: summarized according to FAO and WHO

In Ukraine, a number of documents have also been developed in accordance with certain WHO policies since 2001 (Table 1).

However, obviously this process is still far from completion: it takes some time to develop policy

documents to ensure adequate and quality nutrition according to European standards in Ukraine, and – the efforts of all stakeholders in their further implementation are needed.

Table 1. **Healthy nutrition policy in Ukraine**

Policy	Start
Rules for adding vitamins, minerals and some other substances to food	2023
Cabinet of Ministers of Ukraine Resolution № 305 On approval of norms and procedures for the organization of nutrition in educational institutions and children's health and recreation facilities	2021
Ministry of Health of Ukraine Order № 2205 "On approval of the Sanitary Regulations for general secondary education"	2021
National Action Plan on non-communicable diseases to achieve global sustainable development goals	2018
Orders of the Cabinet of Ministers on approval of the State target social programs for the development of food products intended for children's nutrition for 2010-2014.	2010
Labor Code of Ukraine 1972, as amended by Law No. 1276-VI (1276-17) of April 16, 2009, Verkhovna Rada of Ukraine, 2009, No. 38, Article 535	2009
Urgent measures to organize children's nutrition in preschool, school and educational institutions	2006
Nutrition standards in primary school and health facilities	2004
Health of the Nation in 2002-2011	2002
State program for the prevention of iodine deficiency among the population for 2002-2005	2002
Agreement on the prevention of iodine deficiency disorders in the CIS countries	2001

Source: summarized according to the WHO

Conclusions. A healthy diet from birth and throughout life prevents malnutrition in all its forms, as well as a number of non-communicable diseases. However, increased production and consumption of processed foods, rapid urbanization and lifestyle changes have led to changes in diets. People now consume significantly more foods high in energy, fat, sugar and salt / sodium. At the same time many people do not consume enough fruits, vegetables and whole grains, which contain the necessary fiber, vitamins and minerals for the human body. The required content of a varied, balanced and healthy diet varies depending on individual

characteristics (age, gender, lifestyle and level of physical activity), cultural context, local products and eating habits. Along with this the basic principles of healthy nutrition remain unchanged.

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