

DEPÓSITO LEGAL ZU2020000153  
*Esta publicación científica en formato digital  
es continuidad de la revista impresa*  
**ISSN 0041-8811**  
**E-ISSN 2665-0428**

# **Revista de la Universidad del Zulia**

**Fundada en 1947  
por el Dr. Jesús Enrique Lossada**



**Ciencias**

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**Sociales**

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**y Arte**

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**Año 13 N° 38**  
**Septiembre - Diciembre 2022**  
**Tercera Época**  
**Maracaibo-Venezuela**

## Administrative and legal ways to improving the quality of production and logistics processes in the field of baby food

Natalia Kolbina \*  
Oleksandr Voroniatnikov \*\*  
Yuriy Pyvovar \*\*\*

### ABSTRACT

Purpose: to suggest the ways to improve the quality of production and logistics processes of baby food from the standpoint of administrative and legal regulation. The methodological basis is the use of general scientific methods (observation, experiment, analysis, synthesis, induction, deduction, analogy, systematization, classification) and special scientific methods (comparative, legal analysis, etc.). Results: seven areas of improving the quality of production and logistics processes of baby food have been identified. Conclusions: improving the quality of production and logistics processes of baby food in Ukraine involves development and implementation of a set of measures of managerial, economic, organizational, legal, marketing, logistics character. The production and circulation of baby food is a complicated long process, each stage of which requires constant monitoring of both technological processes and raw materials, storage conditions, transportation, sale. However, the main task of ensuring the quality and safety of baby food is to take necessary measures by the state to implement the principles of the HACCP system and, accordingly, to adapt national legislation in the field of baby food to the norms and standards of the European Union.

KEYWORDS: Food; Public Administration; Production of Baby Food; Children.

\* Ph.D. Student, Kyiv National University of Trade and Economics, Kyiv, Ukraine, ORCID: <https://orcid.org/0000-0001-6139-9279>

\*\* Doctor of Science of Law, Chief Inspector of the International Police Cooperation Department of the National Police of Ukraine, Kyiv, Ukraine, ORCID: <https://orcid.org/0000-0002-3761-698X>

\*\*\* Professor, Ph.D. in Law, Supreme Court, 8-a Moskovska Str., Kyiv, Ukraine. Scopus ID: 57203992023; Web of Science ID: O-4973-2016. ORCID ID: <https://orcid.org/0000-0001-8258-7930>

\*Corresponding author: E-mail: [pyvovaryi@gmail.com](mailto:pyvovaryi@gmail.com)

Recibido: 28/04/2022

Aceptado: 21/06/2022

# Vías administrativas y legales para mejorar la calidad de los procesos productivos y logísticos en el ámbito de la alimentación infantil

## RESUMEN

Propósito: sugerir las formas de mejorar la calidad de los procesos productivos y logísticos de alimentos infantiles desde el punto de vista de la regulación administrativa y legal. La base metodológica es el uso de métodos científicos generales (observación, experimentación, análisis, síntesis, inducción, deducción, analogía, sistematización, clasificación) y métodos científicos especiales (análisis comparativo, jurídico, etc.). Resultados: se han identificado siete áreas de mejora de la calidad de los procesos productivos y logísticos de alimentación infantil. Conclusiones: mejorar la calidad de los procesos de producción y logística de alimentos para bebés en Ucrania implica el desarrollo y la implementación de un conjunto de medidas de carácter administrativo, económico, organizacional, legal, de marketing y logístico. La producción y circulación de alimentos para bebés es un proceso largo y complicado, cada etapa del cual requiere un seguimiento constante tanto de los procesos tecnológicos como de las materias primas, las condiciones de almacenamiento, el transporte y la venta. Sin embargo, la tarea principal de garantizar la calidad y seguridad de los alimentos para bebés es tomar las medidas necesarias por parte del Estado para implementar los principios del sistema HACCP y, en consecuencia, adaptar la legislación nacional en el campo de los alimentos para bebés a las normas y estándares de la Unión Europea.

PALABRAS CLAVE: Alimento; Administración Pública; producción de alimentos para niños; niño.

## Introduction

The sphere of baby food was and remains one of those spheres of the national economy that arouses constant and keen interest of the public and the authorized bodies of public administration. This is not surprising. After all, in the period from birth to adulthood, the state must ensure the implementation of state policy in the field of creating conditions for healthy and complete baby food as one of the main factors in the development of a healthy generation.

Ensuring quality production and circulation of baby food is a chain process carried out by baby food producers at various stages of production, from assessing the quality of raw materials

to the arrival of baby food to the final consumer. In this process, an important role is given to the authorized subjects of public administration, which carry out control and supervision and permitting procedures in the field of baby food. Thus, for now, we will research and propose the ways to improve the quality of production and logistics processes of baby food.

1. The urgency of the problem of the quality of baby food and proposals for its solution

The category of nutrition for infants and young children is influenced by the most common factors that affect the entire food industry, such as economic conditions and demographics in general, and taking into account the special needs of infants and young children for their full physical development. U.S. researchers believe the quality of baby food has a particular impact on fertility rates, breastfeeding patterns, high consumer turnover and competition. All this leads to the growth of constant demands on the products of manufacturers to increase the value of baby food through the introduction of innovative equipment models, the establishment of logistics, which affects safety, convenience and conditions of consumption of baby food.

At the same time, we take into account the fact that it is necessary to separate such two categories as a "food buyer" and a "food consumer". Researches have shown that consumers and buyers in the baby food market are not the same person. The end consumers are children, but at the time of purchase and in most cases they are not buyers (due to their young age) and are not able to influence the choice of product directly. The ability to assess the effectiveness of product selection can be assessed only in the presence of good communication between parents, buyers and children-consumers. It can be stated that this situation significantly complicates not only the assessment of qualitative characteristics and determination of the main consumer identification features of products, which complicates market research (Maligina, 2008, p.250; Bulgakova, 2015, p.316; Anatoliy *et al.*, 2019).

We believe that improving the quality of production and logistics processes of baby food should be comprehensive, taking into account various problem areas. That is why, in

determining the risks and developing ways to improve the quality of production and logistics processes of baby food should be based on the following indicators:

- 1) introduction of the principles of the HACCP system and ensuring the possibility of tracking the "production and consumer chain" by the buyer;
- 2) ensuring compliance with the quality characteristics of baby food to international standards of quality and production;
- 3) taking into account the criterion of financial capacity of the buyer and the type of baby food;
- 4) support of the national producer by developing and implementing programs of state support and stimulating the development of production facilities, as well as exempting small producers of baby food from obtaining certain permits for their products;
- 5) introduction of effective mechanisms for disposal of expired or low-quality baby food from circulation;
- 6) establishing international partnership relations in order to develop import-export relations in the field of baby food;
- 7) control and supervision over the quality and quantity of baby food supplied to preschool and general educational institutions.

## 2. Analysis of the baby food segment depending on buyers and consumers

Baby food after it leaves the production facilities of the manufacturer goes through a several-stage logistics process before it reaches the buyer (in most cases, child's parents). At the same time, the state is the main body authorized to guarantee the child's right for healthy eating. That is why we believe the state, represented by an authorized subject of public administration, should control the process of getting baby food into circulation. This statement applies to both domestic and imported baby food.

It should be noted that the study of the baby food market in Ukraine shows that in recent years the baby food market in Ukraine has shown some positive dynamics: first, increased demand for products due to deteriorating health of women who are forced to replace breast milk with formula; secondly, women's employment has increased and, consequently, the need for

ready-made baby food; third, growing interest in domestic products due to currency fluctuations and economic instability. At the same time, the production of baby food in Ukraine has increased both in the context of meeting the growing demand and the import substitution program. As for consumers, the concentration of the main consumer groups (young families with children) in large million-plus cities is typical: Kyiv, Kharkiv, Odesa, Lviv, Dnipropetrovsk, etc. This is due to the fact that in large cities the standard of living is higher, and accordingly there is a tendency to migration of rural population (mostly under the age of 25) to large cities (or suburbs). That is, the density of both the adult population and the main group of consumers of baby food - infants and preschool children in megacities is higher. All these factors lead not only to the concentration of the population, but also to the localization of markets for baby food manufacturers and, consequently, high competition from sellers and producers of these products. All these factors lead to the fact that although the market is growing, it is not in short supply (Chazov, 2015, pp. 664-667).

Thus, taking into account the highlighted factors, it is expedient to talk about the introduction of state incentive programs of state support for the national baby food producers, and strengthening control and supervision of their production, circulation and quality. It is a bit more difficult to ensure continuous control over imported baby food, as when entering the territory of Ukraine, these products come into circulation and, accordingly, all risks in terms of quality and shelf life fall on the business entities that sell these products. Thus, today in Ukraine the market of baby food is represented as follows: 25% own production of baby food: PJSC “Khorol dairy cannery of children's products“, “Southern cannery“ LLC, PJSC “Odesa cannery of baby food“, PJSC “Galakton“, “Favor” LLC, “Prydniprovskiyi Combine” PJSC, “Lyustdorf” LLC, PJSC “Wimm-Bill-Dann Ukraine”, PJSC “Yagotyn Dairy Plant”, PJSC “Yagotynske for children”, Municipal Dairy Factory - Baby Food Kitchen, TM “Agusha“ (Kyiv region) (Kolbina, N., 2021, p.76), and 75% of foreign manufacturers: “Nan“, “Abbott Laboratories“, “Novartis“, “Bristol-Myers“, “Bristol Myers“ Squibb Enfamil”, “Abbott Laboratories“, “Numico“, “Heinz“, “Nestle“, “Danone“, “Hipp“, “Hero“.

### 3. Methods

The methodological basis is the use of general scientific methods (observation, experiment, analysis, synthesis, induction, deduction, analogy, systematization, classification) and special scientific methods (comparative analysis, questionnaires and surveys, legal method, etc.).

The method of observation was used in the study of consumer activity of buyers of baby food depending on: nutritional value; financial capacity; social status, etc. According to the results of the observation, the birth rate in Ukraine is rapidly declining compared to previous periods, due to insecurity in the future, reduced financial independence, ineffective public policy in the field of social protection and others. These negative trends directly affect the level of purchasing power of baby food by the population.

The use of methods of experiment, analysis, synthesis, analogy made it possible to determine the groups of most popular baby foods; to establish a direct dependence of the financial stability of the buyer on the quality and class of consumer baby food; identify the most pressing issues facing parents / legal representatives who buy baby food.

Methods of systematization and classification made it possible to identify areas for improving the quality of production and logistics processes of baby food.

The use of survey methods made it possible to conduct surveys in grocery stores among buyers of baby food on: the quality of baby food; compliance of the price of baby food with its nutritional properties; identify groups of the most sold baby food by its manufacturers and types.

The comparative method was used in the study of international experience in the production and storage of baby food, in particular, the experience of the United States, Germany and China.

The legal method provided an opportunity to analyse the rules of national law, to identify conflicting rules and to propose rules that would improve the production and circulation of baby food.

#### 4. Results and Discussion

Today's current priority is the integration of Ukraine into the European Economic Area. An important step in such integration is accession to the World Trade Organization, signing the Association Agreement with the EU, which requires Ukraine to radically improve the quality of governance nationwide and significantly increase the efficiency and competitiveness of domestic enterprises in various sectors. The problem of baby food quality is especially relevant.

#### 4.1. HACCP and baby food

Of particular importance is the provision of state control and supervision at all stages of production and circulation of baby food is Ukraine's desire to join the European Union, as well as the signing and, accordingly, ratification of a number of international agreements in the field of food. At the same time, it should be noted that in Ukraine the food industry operates on the principle of "from field to table", which provides safety and quality of all stages of food production, as well as the HACCP system - identification of hazards and control of critical points (Food safety control: useful lessons from other countries, 2010). The principles of the HACCP system must be implemented in the field of baby food.

In our opinion, the introduction of the HACCP system in the field of baby food in Ukraine will allow: 1) to exercise state control from production to sale to the buyer; 2) control over the quality of baby food; 3) determine the types of baby food that are in demand, and vice versa; 4) improve the quality of baby food, given the obligation of manufacturers to comply with international norms and standards in this area.

At the same time, we believe it is necessary to create an online register of baby food on the online resource of the authorized central executive body in the field of baby food, which will allow buyers to identify those baby food producers that are the best according to experts and buyers. Such an online register, in our opinion, should provide information about baby food, namely: name; product size; product type; product category; nutritional value (including calories, fats, carbohydrates, sugar, salt, sodium and other impurities per 100 grams of product), packaging requirements (plastic, tin, cardboard, etc.).

It is especially important to determine this information in the context of the fact that in the production of fruit and vegetable crops manufacturers can use plant protection products



containing heavy metals and other contaminants and further reflected in the quality of baby food, as well as a certain type of packaging to avoid counterfeit of baby food and not to violate the conditions of its transportation and storage.

In addition, it is necessary to ensure that the buyer is able to track the “production and consumer chain”, which will allow the buyer to obtain information about baby food, its composition, ISO, nutritional value and shelf life by studying the information on the label.

The next step is to ensure compliance with the quality characteristics of baby food to international standards of quality and production; in this case we mean compliance of baby food of domestic producers with international norms, standards and rules, which will allow export of these products and recognition of baby food internationally.

The HACCP principles are a focus on hazard identification, monitoring and control at critical control points identified throughout the production chain. These include the following seven principles: 1) analysis of hazardous factors; 2) identification of critical control points; 3) setting limit values; 4) introduction of a control system for CCT; 5) establishing corrective actions that need to be taken when observations indicate that a certain CCP is out of control; 6) establishing a verification procedure to confirm that the HACCP system is working effectively; 7) developing methods for documenting all procedures and keeping records related to the application of these principles (HACCP).

To implement the provisions of the HACCP system in Ukraine, a number of DSTUs have been developed and adopted, namely: DSTU ISO 22000: 2019 (ISO 22000: 2018, IDT); DSTU ISO / TS 22002-1: 2019 (ISO / TS 22002-1: 2009, IDT); DSTU ISO / TS 22002-2: 2019 (ISO / TS 22002-2: 2013, IDT); DSTU ISO / TS 22002-3: 2019 (ISO / TS 22002-3: 2011, IDT); DSTU ISO / TS 22002-4: 2019 (ISO / TS 22002-4: 2013, IDT); DSTU ISO / TS 22002-6: 2019 (ISO / TS 22002-6: 2016, IDT); DSTU ISO / TS 22003: 2019 (ISO / TS 22003: 2013, IDT).

At the same time, food products of Ukrainian origin face many problems of international recognition. Thus, one problem related to determining the safety and quality of food products of Ukrainian origin and entering the international market of Ukrainian market operators as exporters is the lack of HACCP auditors (specialists) in Ukraine, who award HACCP certificates to Ukrainian market operators. (Zapototska, 2019, p.430).

In addition, the Concept of the state policy in the field of food and food safety management based on the HACCP principles has not been adopted; the standard and complex system of sanitation and hygiene in the production of baby food has not been introduced, as well as the use of obsolete equipment; use of low-quality raw materials in the production of baby food; violation of the conditions of transportation and storage of baby food, i.e. proper compliance with the requirements for transportation, storage of baby food leads to spoilage, damage, violation of thermal regimes, packaging (Kolbina, 2021, p.77).

Standards for the appearance and content of baby food labels in general do not differ from the requirements for any food product, however, given the special consumer - infants and young children, this general list is supplemented. However, there are some unique requirements for the category. For example, total fat, saturated fat, and cholesterol are not required on baby food labels, as these nutrients should not be restricted in infants' diets. Baby food, on the other hand, requires labelling of these nutrients. A number of common, approved items are not assigned or restricted in these categories. The biggest is the actual impact in these categories of artificial colours, artificial flavours and preservatives. Some of their natural analogues are used; however, this is usually limited to certain foods for older children and toddlers. The use of basic foods such as sugar and starch is also limited, especially in the infant segment (Formulation and Manufacturing of Infant and Toddler Foods, 2003).

#### 4.2. Quality of baby food and purchasing power of the buyer

The next thing we would like to draw attention to is a direct dependence of the criterion of financial capacity of the buyer and the type of baby food. Yes, despite the fact that baby food is becoming increasingly popular due to various objective and subjective circumstances, still, the buyer pays attention to the price of the product. Unfortunately, the level of income determines the ability of parents to buy one or another type of baby food, not always choosing the manufacturer that is best and more suitable for the consumer's diet. Incomes of the population in 2020 amounted to 3972.4 billion UAH, costs - 3989.4 billion UAH, reduction of savings - 17.0 billion UAH. The disposable income per capita was 73,355 UAH. (Incomes and expenditures of the population in 2020. Express issue of the State Statistics Service of Ukraine, 2020). Incomes

of the population in the first quarter of 2021 amounted to 983.6 billion UAH. Expenditures of the population during the first quarter of 2021 amounted to 1,067.0 billion UAH, which significantly exceeded revenues and caused a decrease in household savings by 83.4 billion UAH. However, real wage growth has been markedly slowed by inflation, which has accelerated in recent months. It will be recalled that consumer inflation slowed to 8.4% in April 2021 (from 8.5% in March 2021) and remained above the upper limit of the National Bank's inflation target of  $5\% \pm 1\%$ . In the first four months of the current year, the average real wage grew by 11.3% year-on-year. It should be noted that despite the growing income of the population, more than half of Ukrainians consider their income insufficient for living (Didenko, 2021). In general, for 11 months of 2021, inflation in Ukraine was 9.4%, basic inflation - 7.4%. Accordingly, rising inflation reduces the savings and income of citizens, which cannot but affect their purchasing power, including the baby food market.

At the same time, it should be noted that the excess of the number of deaths over the number of live births remains significant: 41 live births per 100 deaths. At the same time, the number of the available population (estimated) as of September 01, 2020 in January-August of the same year amounted to more than 41.7 million people. In addition, the overall decline over the same period accelerated from -178,418 people in 2020 up to 245,889 in 2021. In the first half of 2021, 32,595 children were born. This is 5% less than in the first half of 2020, when there were 139,134 newborns, and 11.5% less than in the first half of 2019, when there were 149,549. The average monthly figures are easy to see how the birth rate decreases every month. In 2019, an average of 25.7 thousand babies were born every month, in 2020 24.5 thousand, in the first half of 2021 - 22 thousand newborns. In six months, 349,041 people died in Ukraine. Thus, the total population decline was 216,446 people. Compared to the last 10 years, the birth rate has decreased by 40% (The birth rate in Ukraine continues to fall and is preparing to set a new anti-record for the last 30 years, 2021).

Thus, the birth rate in Ukraine is rapidly declining compared to previous periods, this is due to uncertainty of citizens in their future, reduced financial independence, ineffective public policy in the field of social protection and others. These negative trends directly affect the level of purchasing power of the population of baby food.

Thus, the main restraining factors in the development of the baby food market are the level of income of buyers, rising birth rates and the general demographic situation in society.

#### 4.3. The role of the state in ensuring the quality of production and circulation of baby food

Another important step is to support the national producer by developing and implementing state support programs and stimulating the development of production facilities, as well as exempting small producers of baby food from obtaining certain permits for their products.

The current state policy in Ukraine does not sufficiently stimulate the development of enterprises producing baby food and does not provide a comprehensive system of management and support of enterprises in the industry. In this regard, there is a need to develop new approaches to the long-term development of enterprises in the study industry, taking into account the need to strengthen government regulation (Voronina G., 2011, pp. 35-39). Government policy tightly regulates the baby food market by limiting the profitability of production and trade margins of distributors of domestic products. Reckless government regulation has made it more profitable for distributors to trade in foreign products, which are much more profitable to sell than domestic ones. Supermarket shelves are filled with imported baby products. Thus, when there is no state order, the restriction of the mark-up significantly hinders the promotion of domestic baby food on the Ukrainian market. Distributors deal with this group of products more for the range. Under these conditions of state regulation, Ukrainian producers of baby food products cannot develop normally, modernize production, and advertise their products (On baby food: Law of Ukraine, 2006).

In our opinion, the study of the dynamics of the baby food market, the needs of domestic baby food producers, the development of promising steps to implement state support measures, the development of national and regional programs for the development of baby food production should be delegated to a specially created body, which would deal as a part of State Service of Ukraine for Food Safety and Consumer Protection - Commission on Development of Baby Nutrition. The activities of this body should be carried out in constant intersectoral cooperation with the Ministry of Economic Development and Trade of Ukraine, the Ministry of Healthcare

of Ukraine, the Ministry of Agrarian Policy and Food of Ukraine, the Ministry of Social Policy of Ukraine and other relevant public administration entities.

A similar body has been established and operates in some developed countries. For example, in the United States and Germany, governments have a government-led working group or committee composed of representatives from many government agencies and bodies. The purpose of such a working group or a committee is to ensure coordinated work of various public bodies in the field of child nutrition. Such public bodies, whose representatives are members of the working group or committee are: healthcare (for example, maternal and child health; nutrition, food and medicine, food standards); representatives of customs and border authorities (in the affairs of control); representatives of the bodies of consumer affairs (such as the State Service of Ukraine for Food Safety and Consumer Protection); representatives of food authorities; media and communications; representatives of the trade body; representatives of the bodies of finance and economic development, justice, etc. A working group or committee chaired by the government ensures the inclusion and facilitation of dialogue with a wider group of participants, which will include, for example, professional organizations, civil society, legislators, advertising and the media industry. A government-led working group or committee must ultimately reach consensus on intervention priorities, identify available public policy measures, and decide how to implement them for the development of child nutrition in the best way. In the countries with special food legislation, the Department of Healthcare often already heads a stakeholder group, such as the US National Breastfeeding Committee, which oversees the monitoring and enforcement of the Code (Guidance on ending the inappropriate promotion of foods for infants and young children: implementation manual, 2020, p.22).

In Germany, the National Breastfeeding Committee has been integrated into Max Rubner Institute. The transition is linked to the Baby Food Institute, which opened at Max Rubner Institute in February 2019. The facility plans to conduct early exposure studies that determine the risk of overweight and nutrition-related diseases; eating behaviour of children and adolescents from birth until 18 years; composition and quality of baby food, etc. (National Breastfeeding Committee).

In a number of other countries where there are no such especially established bodies, infant and young child nutrition is the responsibility of the Ministry of Women's and Children's Development (e.g. India).

#### 4.4. The problem of withdrawal of expired or low-quality baby food and proposals for its solution

Particular attention needs to be paid to solving the problem of implementing effective mechanisms for withdrawing expired or low-quality baby food from circulation.

Products may become dangerous if they have not been sold within the allotted time for consumption. Usually overdue products are sold at significant discounts. In this case, the uncontrollability of the process is typical, in addition, the presence of deviations in the quality of food products and its hazards. Due to the potentially serious consequences of deviating from the cut-off value, food monitoring procedures for their suitability must be effective. Ideally, monitoring should provide timely information to enable any process control, thus preventing loss of process control and exceeding the limit values until the product needs to be isolated or rejected. Unfortunately, this is not always possible. In practice, operating values are often used to provide a safety margin that leaves extra time to control the process until the limit value is exceeded (HACCP system. Handbook, 2003, p.111). Usually, a responsible person is appointed at the enterprises to monitor the process of returning and rejecting food products.

How does a process of food shortage and return occur in practice? The market operator, which carries out activities on sale and / or circulation of food products and / or other objects of sanitary measures, adheres to one or another food product until the last term of use, hoping to sell it profitably. However, if this food product has not been sold, it returns the food product to the market operator engaged in economic activities related to primary production or food production, with all losses for untimely sale, and as a result overdue food product bears only a market operator that carries out economic activities related to primary production or food production. In our opinion, such a situation is practically and theoretically unacceptable, as only one party bears the losses. We believe in this case we need to talk about civil liability, when the losses are shared between the parties of the contract. The solution of this situation is possible

as follows: in the agreement between the parties the period of return of unsold food - no later than 10 days before the deadline for consumption indicated on the package should be provided. In case of return of the goods later than the specified date, the parties bear the losses in equal parts (Zapototska, 2019, p.438).

The situation with the return of baby food is a bit more complicated. After all, if 75% of baby food is of imported origin, then the question arises, whom to return overdue (not sold on time) and spoiled baby food products? In our opinion, the solution of this problem is possible by dividing baby food into general (baby food that can be purchased at grocery stores: cereals, cookies, dairy products, etc.) and special purpose (mixtures, additives, complementary foods, etc.). The vast majority of general baby food is domestically produced, while special baby food is imported. That is why we believe it is possible to allocate the circulation of special baby food in separate food departments or in a network of shops selling special baby food. To establish that in the departments of grocery stores and special chain stores selling baby food the specialists with relevant education constantly work being able to provide information and consulting services on peculiarities of the content of baby food; energy value of baby food; allergic and other side effects; to differentiate between various features of baby food from different manufacturers; to monitor the expiration date of baby food and the timeliness of withdrawal of baby food from such circulation in case of expiration or damage to packaging.

In contrast to Ukraine, in highly developed countries more than 70% of baby food is distributed through a network of branded stores (in contrast to the trend that has developed in Ukraine, when the predominant trade in baby products in supermarkets). In Europe, the network of specialized stores selling baby food can be divided into 3 main segments. The largest of these are milk-based products (breast milk substitutes), which are used to feed infants in the first 6 months of life. This segment accounts for 64% of total sales. The second segment - canned products (purees, juices, canned vegetables and meat) is 20%. The last segment - breakfast cereals (in the form of cereals, crackers) is 11%, 5% is the rest. A significant contribution to the development of the baby food industry was made by the development of technology for production of dry mixes based on skim milk and cereals, but the profitability of this group of products is quite low, which slows interest in it from producers. The most significant market

segment - breast milk substitutes, which account for almost 2/3 of total baby food sales in the world, can be divided into 4 groups: products for children aged 0 to 6 months (80%), from 6 months to 1 year (10%), special baby food (7%); products for children from 1 to 3 years (3%). Milk-based products are available in the form of milk powder, liquid concentrate and ready-to-eat mixture. Consumption of breast milk substitutes varies from region to region. For example, 75% in North America and 80% in Asia and only 41% in Eastern Europe. The second most important segment - canned products (purees, juices, canned vegetables and meat) - has the highest sales in Europe, in developing countries, traditionally dominated by home-made products. The level of consumption of products of the third segment - dry mixes (in the form of cereals, crackers, mixtures of cereals, frozen dried cereals) is high in Europe and Asia and depends on the degree of "naturalness". Significant differences in the sales of baby food in developed and developing countries (Formulation and Manufacturing of Infant and Toddler Foods, 2003).

The Ukrainian baby food market is attractive with a small number of competitors, the segmental market is represented by the following manufacturers: 1) dry mixes and porridges: Khorol Children's Food Factory (Nutritek, Malysh, Malyutka, Malyshka), WISE (TM "NYAMNYAM"), Southern Cannery (Baby Food Association, TM "Karapuz"); 2) liquid and pasty dairy products: Wimm-Bill-Dann Ukraine (TM "Agusha"), "Yagotynske for children" ("Dairy Alliance", TM "Yagotynske for children"), Prydniprovskiy plant TM "Zlagoda"), "Danone Dnipro" (TM "Tyoma"), Firm "Favor" (TM "AMO"); 3) fruit and vegetable juices and purees: Odesa Children's Food Factory ("Vitmark-Ukraine", TM "Chudo-Chado"), Southern Cannery (Association of Baby Food, TM "Karapuz"); 4) water for children: enterprise with foreign investment "Ekonia" (TM "Baby", "Akvulya"), Firm "Hipp-Uzhgorod" (TM "Baby Vita"), Khorol Children's Food Factory "Khorol", "Nutritek", TM "Malysh"), Myrgorod Children's Food Factory (TM "Aqua Nanny"); 5) special purpose tea: HippUzhgorod Company (TM "Baby Vita") (Golovina, 2018, p.140).

Scientists from Germany, the United States and the People's Republic of China, conducting research on the beneficial properties of breast milk after freezing and storage in frozen form, emphasize the partial loss of useful properties. However, it is noted that the



benefits of frozen milk are higher than those of artificial analogues (Fan J.C., Ren R., He H.L., Jin Q., Wang S.T. 2020, p. 1897-1905; Zimmermann S., Gruber L., Schlummer M., Smolic S., Fromme H., 2020, p. 1780-1790; Fromme H., Gruber L., Seckin E., Raab U., Zimmermann S., Kiranoglu M., Schlummer M., Schwegler U., Smolic S., Volkel W., 2020, 715-722). The special value of meat (canned meat) baby food was emphasized by T.L. Golubenko, distinguishing the dominant role of veal among other types of meat (Golubenko, 2020, pp. 637-643).

Taking into account the selected types of baby food, their features are set by manufacturers and different conditions and rules for their storage. That is why our proposal to create specialized stores / departments for the sale of baby food is also timely because it will control the compliance with temperature regimes for storing baby food.

Manufacturers of baby food in Ukraine export their products mostly to the CIS countries. Thus, export deliveries consist mainly of baby dry mixes. 92% of total exports fell to the CIS countries, including Kyrgyzstan (40%), Azerbaijan (38%), Moldova (10%), Turkmenistan (5%). In addition, small amounts of Ukrainian baby food are exported to Poland, Georgia, Armenia, Belarus and other countries.

International cooperation in the field of ensuring the proper quality and safety of baby food is carried out through: participation in the work of international organizations; concluding international agreements on the development of new types of baby food and promising technologies for its production; harmonization of requirements for the quality and safety of baby food with the relevant international requirements; exchange of information on measures used to ensure the quality and safety of baby food, including the implementation of risk analysis and control (regulation) at enterprises at critical points (HACCP) (On baby food: Law of Ukraine, 2006).

At the same time, the lack of certain types of baby food of its own production is compensated by imported well-known brands, which range covers virtually all niches (from water to special dry mixtures for medical purposes). In the structure of imports, 90% fall into four categories, namely dry or pasty mixtures, which accounted for 37%, juices, which accounted for a quarter of deliveries, puree, which accounted for 16% of imports, dry cereals, which accounted for 12%. Among the countries supplying baby food to the Ukrainian market are

Austria, Belarus, the Netherlands, Germany, as well as Great Britain, Spain, Poland, Slovenia, Czech Republic and other countries, whose share in total imports did not exceed 5%. The traditional suppliers of dairy products to Ukraine are the European Union (Germany, Poland, France, Finland) (Prikhodko & Fitalieva, 2018, pp. 28-35).

#### 4.5. The role of state control over compliance with quality standards for baby food at pre-schools and schools

Particularly important in the field of baby food is the control and supervision of the quality and quantity of baby food that goes to preschool and secondary schools.

The main issues of baby food safety related to microbiological, microphysical or chemical substances are addressed in advance in the group of product safety, quality assurance and production. Manufacturers of baby food in the production of baby food must comply with both national and international regulations. From the point of view of quality, special attention is paid to compliance with regulatory requirements, development of supplier / manufacturer relations, support of the most modern quality systems and quality of compliance of elements with strict specifications. In order to maintain the trust of baby food buyers, the quality and safety standards of baby food are given priority.

Starting in 2020, school nutrition reform has been introduced in Ukraine. The Ministry of Healthcare of Ukraine has developed and approved updated sanitary regulations for general secondary education, new regulations (order of the Ministry of Healthcare of Ukraine dd. September 25, 2020, No. 2205 "On approval of sanitary regulations for general secondary education", and resolution of the Cabinet of Ministers of Ukraine No. 305 "On approval of norms and procedures for organization of nutrition at educational institutions and children's health and recreation facilities") and the procedure for organizing the nutrition of students. These documents were prepared in the light of international experience and the recommendations of the World Health Organization on the principles of healthy eating. The physiological needs of children for basic nutrients and energy were also taken into account. The implementation of the reform of the school nutrition system will allow not only to preserve the health of children, but also to form healthy eating habits in adulthood and thus reduce the overall level of non-communicable diseases among adult Ukrainians.

Health workers monitor the observance of nutrition norms at preschool education institutions and keep a journal of nutrition compliance, which is filled-in daily on the basis of a menu-schedule. Nutritional compliance analysis is performed once every four weeks. The results of the analysis are brought to the attention of the head of the relevant institution on a monthly basis. Control over the organization of food, compliance with the requirements of sanitary legislation and legislation on food safety and quality is carried out in accordance with the law. The quality of food is assessed by laboratory tests of one meal, as well as the daily diet. Thus for laboratory researches (tests) dishes of one meal are selected, and dishes of other meals of this day are estimated theoretically according to the menu-schedule (On establishment of norms and the Order of the organization of nutrition at educational institutions and baby establishments of improvement and rest, 2021).

Food products at general secondary educational institutions must meet the requirements of sanitary and safety legislation. The procedure for ensuring food, its quality and safety is regulated by the Sanitary Regulations for General Secondary Educational Institutions and the laws of Ukraine "On Basic Principles and Requirements for Food Safety and Quality", "On State Control over Observance of Legislation on Food, Feed and Animal By-Products", veterinary medicine and animal welfare".

## Conclusion

Improving the quality of production and logistics processes of baby food in Ukraine involves the development and implementation of a set of measures of managerial, economic, organizational, legal, marketing, logistics area. The production and circulation of baby food is a complex long process, each stage of which requires constant monitoring of both technological processes and raw materials, storage conditions, transportation, sale. However, the main task of ensuring the quality and safety of baby food is to take the necessary measures by the state to implement the principles of the HACCP system and, accordingly, to adapt national legislation in the field of baby food to the norms and standards of the European Union.

In order to improve the quality of production and logistics processes in the field of baby food, we offer the following.

First, the introduction of stimulating programs of state support for the national producer of baby food by the state, and the strengthening of control and supervision of their production, circulation and quality. Creating conditions for supporting the national producer by developing and implementing programs of state support and stimulating the development of production facilities, as well as exempting small producers of baby food from obtaining certain permits for their products.

Secondly, the introduction of the HACCP system in the field of baby food in Ukraine will allow: 1) to exercise state control from production to sale to the buyer; 2) control over the quality of baby food; 3) determine the types of baby food that are in demand, and vice versa; 4) improve the quality of baby food, given the obligation of manufacturers to comply with international norms and standards in this area.

Thirdly, the main constraints on the development of the baby food market are the level of income of buyers, rising birth rates and the general demographic situation in society.

Fourthly, it is proposed to establish a Commission for the Development of Baby Nutrition. The activities of this body should be carried out in constant intersectoral cooperation with the Ministry of Economic Development and Trade of Ukraine, the Ministry of Healthcare of Ukraine, the Ministry of Agrarian Policy and Food of Ukraine, the Ministry of Social Policy of Ukraine and other relevant public administration entities.

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