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N. I. CHEREVYCHNA[1], PhD (Technics)
Associate Professor at the Department of Hotel, Restaurant Business and Kraft Technologies
e-mail: nataliia.cherevychna@hneu.net ORCID ID: https://orcid.org/0000-0002-6660-5366
Simon Kuznets Kharkiv National University of Economics
9-A Nauky Ave, Kharkiv, 61165, Ukraine

D. P. KRAMARENKO[1], PhD (Technical)
Associate Professor at the Department of Hotel, Restaurant Business and Kraft Technologies
e-mail: kramarenkodp@gmail.com ORCID ID: https://orcid.org/0000-0003-1353-686X
Simon Kuznets Kharkiv National University of Economics
9-A Nauky Ave, Kharkiv, 61165, Ukraine

N. I. HIRENKO, PhD (Technical)
Associate Professor at the Department of Professional Education, Restaurant and Tourism Business
e-mail: n.i.hirenko@gmail.com ORCID ID: https://orcid.org/0000-0001-6854-8257
Luhansk Taras Shevchenko National University
2, Viktora Novikova Str., Lubny, 37500, Ukraine

ENVIRONMENTAL ASPECTS OF BABY FOOD PRODUCTION

Purpose. To study the current state of the baby food market in Ukraine in terms of environmental aspects of production, quality and safety management of raw materials and finished products, environmental labelling and harmonisation of national legislation in the field of baby food with European standards.

Methods. System-structural, abstract-logical, statistical method, methods of induction, deduction, comparison, as well as system-analytical method.

Results. The article presents the national (commodity and medical) and European classification of baby food. It is determined that 64 % of the Ukrainian market is made up of imported products (mainly Nestlé, Danone, HiPP brands), which have advantages due to the use of specialised European raw material zones. The article describes domestic baby food producers that compete with imported analogues. It is noted that some of them are introducing environmental innovations in production and packaging. The author highlights the impact of the latest legislative changes of 2025-2026 on environmental labelling, safety control and environmental friendliness of baby food products. This indicates a significant shift in the vector of greening at the legislative level towards the harmonisation of Ukrainian legislation with European legislation. The article also examines the problem of greenwashing in Ukraine and the effectiveness of the national legislative framework in combating the misuse of pseudo-environmental labelling.

Conclusions. The article confirms that the introduction of an environmental labelling system is a key preventive mechanism for ensuring the safety of baby food. Global and Ukrainian sociological studies show a high demand for organic baby food. However, the spread of greenwashing reduces the trust of Ukrainian consumers in local brands in favour of European ones. Overcoming this problem and focusing on the concept of Zero Waste and sustainable development are critical to increasing the competitiveness of domestic producers.

KEY WORDS: *baby food, environmental safety, environmental labelling, specialised raw material zones, greenwashing, organic products, European integration*

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Introduction

Baby food products are a group of products for feeding children in the first three years of life, preschoolers and schoolchildren, as well as specialised products for therapeutic nutrition of sick young children. They are designed to meet the nutrient needs of the child's body at different stages of its development. Since food is a plastic material for building the basic tissues of a growing organism, as well as a source of energy to make up for the energy expenditure in the course of life, the role of baby food products for the child's body is extremely important.

The production and sale of baby food products requires special attention from both producers and market operators and consumers of this product group. Providing children with-safe and high-quality food is a national priority for any country.

Today, there is no unequivocal opinion on ecological bioproducts. A number of experts believe that it is necessary to distinguish between the concepts of environmentally friendly production, where the product is manufactured, and an environmentally friendly product that meets the standards of human nutrition. For example, if a company uses motor vehicles with internal combustion engines for its production, it cannot be classified as environmentally friendly.

Organic products are most relevant in children's nutrition due to the physiological characteristics of a child's body, which is more sensitive to the presence of harmful chemicals in food than an adult's body. Therefore, in some countries, organic products account for half of the baby food market.

The fundamental aspects of quality management and environmental safety of food products at the stage of raw material selection are covered in the works of Y. Slyva, N. Bukalova, T. Prylipko, and V. Nosik. O. Rechun, O. Peredrii, V. Ploskonos, V. Halysh, and O. Rechun have studied the issue of technologies for the production of environmentally friendly packaging materials and the assessment of environmental risks associated with the migration of toxic substances from packaging materials into baby food products. Researchers E. Mykhailova and M. Vorozhbiyan analyse the Ukrainian and European experience of introducing environmental labelling as an effective mechanism for ensuring the safety of baby food. The issue of environmental labelling and eco-certification of baby food is reflected in the scientific works of S.V. Berzina and N.M. Bogatko [1-8].

Despite the process of implementation of European legislation in the field of legal and regulatory measures, the system of state control over food safety in Ukraine, namely in the baby food sector, is still undergoing improvement. Therefore, the purpose of this study is to investigate the current state of the baby food market in Ukraine in terms of environmental aspects of production, quality and safety management of raw materials and finished products, environmental labelling and harmonisation of domestic baby food *legislation* with European standards.

Objects and Methods of Research

The object of the study is baby food with an emphasis on the integrated system of ensuring its quality, environmental safety and compliance with regulatory standards. The methodological basis of the article is based on the use of a set of analytical, statistical, logical and system-structural methods. The study uses a systematic approach, according to which all market processes and phenomena in the field of baby food production were analysed in their integrity and interdependence.

The following scientific methods were used to obtain the main theoretical results: abstract and logical, methods of analogy, comparison, induction and deduction. In analysing the current state of the domestic baby food market, the statistical method was used; the method of comparison (critical understanding of methodological approaches, concepts, models and proposals of leading scientists dedicated to increasing environmental awareness and enhancing safety in the field of baby food production); systematic and analytical method (study of legislative acts and other regulatory documents). All of these research methods complement each other and together provide an opportunity to comprehensively consider the subject of the study.

Results and Discussion

Baby food products are divided into subgroups depending on the type of main raw material:

– grain-based
– milk-based;

– fruit and berry and vegetable based;

– fish and meat-based.

Along with the above commodity classification, a medical classification is used, which identifies four groups of products that children need for the entire period of growth and development, taking into account their daily needs and the child's age (in ml):

Group 1 – Protein-containing foods (meat, fish, eggs, cottage cheese, curd, peas, beans, soya, lentils), the daily requirement for which is 100+15n, where n is the number of years of the child.

Group 2 – Milk and dairy products. Their daily requirement is 500-600 г regardless of age;

Group 3 – Fats, which should include animal oil (15+n), vegetable oil (5+n), natural unvitaminised cod fish oil (5+n);

Group 4 – Fruits and vegetables (except potatoes), including juices, the daily requirement for which is 300+30n [9].

The European classification of baby foods has a legal and regulatory framework based on Regulation (EU) № 609/2013 and related directives.

Unlike the traditional commodity classification by type of raw material, European legislation divides products into four main categories depending on their purpose and the physiological needs of the child.

1. *Infant formula and follow-on formula,* which fully or partially replace breast milk. They are divided according to the age of the child into:

– Infant formula, intended for babies from birth to 6 months (labelled with the number 1 or the word Pre on the packaging);

– Follow-on formulas intended for children aged 6 months and older as a liquid component of complementary foods (labelled with the numbers 2 (from 6 months), 3 (from 10–12 months) and 4 (from 18 months and older).

2. *Processed cereal-based foods* for feeding infants and young children during weaning or transition from formula to regular food. It includes: simple cereal porridges (to be diluted with milk or other liquid); cereal milk porridges (to be diluted with water only); baby pasta; crackers and baby biscuits.

3. *Baby foods, which are not mixtures or cereal products*. They are divided by consistency and composition depending on the age of the child:

– one- or two-component homogenised fruit, vegetable or meat purees (from 4–6 months);

– purees with a soft texture containing small pieces to stimulate chewing skills (from 8 months);

– multi-component ready-to-eat meals (stews, pasta with meat, etc.) adapted to the needs of children from one year old and containing larger pieces (from 12 months);

– fruit bars, special children's yoghurts, fruit and milk desserts.

4. *Foods for Special Medical Purposes* are developed exclusively for children with diagnosed diseases, disorders or specific medical conditions whose needs cannot be met by regular food (hypoallergenic and anti-reflux formulas, food for premature and underweight children, lactose-free formulas or specialised amino acid formulas)

European baby food manufacturers also use a unified age navigation (Stages) on labels, which corresponds to the consistency of the product and the ability of the child's gastrointestinal tract to absorb certain ingredients (4+ months, 6+ months, 8+ months, 10+ months, 12+ months) [10].

According to official statistics, the production of domestic baby food products is estimated at about 6.3 thousand tonnes per year. The largest share in the total production of these products is milk-based baby food (59 %), as well as fruit and vegetable purees and juices (about 26 %). Smaller volumes are represented by flour-based baby food (about 8%) and various homogenised fruit and berry products (about 7 %) [11].

In Ukraine, the demand for domestic baby food products is more than half met by imported products. The largest importers of baby food on the Ukrainian market are European countries, accounting for 64 % of total imports.

Today, Ukraine has a stable range of suppliers of imported baby food (Table 1). The key positions are held by multinational corporations such as Nestlé (Switzerland) – NAN, NESTOGEN, Gerber brands; Danone/Nutricia (Netherlands) – Aptamil, Milupa brands; HiPP (Austria). The German company Humana and the Czech company Hamé, as well as Slovenian brands Bebi and Frutek, are also active in the market. Much of the products of these brands are manufactured at powerful European factories in Eastern Europe, in particular in Hungary, Poland and the Czech Republic, which ensures stable logistics to the Ukrainian market [11, 12].

It is noteworthy that in 2026, great emphasis is placed on specialised (therapeutic) nutrition for children, where Nutricia and Nestlé are almost monopolists.

Table 1

Results of the analysis of the main suppliers of baby food

Company / brand (country)	Status in the Ukrainian market	Characteristics of the company
Nestlé (Switzerland)	Leader	NAN, NESTOGEN, Gerber brands. Nestlé is actively investing in production in Ukraine, although most baby food remains imported.
Danone (Netherlands)	Leader	Brands Aptamil, Milupa. Nutricia are part of the Danone group. They have a large share in the formula and cereal segment.
HiPP (Austria)	Stable	One of the most popular brands of organic baby food. It is supplied mainly from factories in Germany, Austria and Hungary.
Humana (Germany)	Active	Stable presence in pharmacy chains and speciality stores.
Heinz (Germany)	Limited presence	After the sale of a number of plants in Eastern Europe, the brand's share in Ukraine slightly decreased compared to 2010-2019.
Hame (Czech Republic)	Niche	Remains a representative in the pureed meat segment.
Frutek (Slovenia)		A brand of Fructal that is present on the market but has less marketing activity compared to the leaders.
Bebi (Serbia, Slovenia)		The Bebi brand (formerly Droga Kolinska) is now owned by the Serbian Nelt Group or Atlantic Grupa (depending on the region of distribution). Production is often localised in other EU countries.

The main advantages of imported baby food include:

– a wider range of products: from adaptive breastmilk substitutes to complementary foods and clinical nutrition;

– a wide range of foods for children with special needs (hypoallergenic and lactose-free formulas, products for premature babies, etc;)

– maximum closeness of the majority of imported formulas to breast milk in terms of composition and, therefore, better acceptance by infants;

– use of modern ergonomic packaging materials for long-term storage without loss of quality and nutrients;

– the use of environmentally friendly raw material areas and a strong scientific base that ensures a high level of product quality and safety [13].

It is well known that high-quality raw materials are the key to product safety for children. To obtain high-quality raw materials, it is necessary to allocate environmentally friendly land where no synthetic fertilizers, pesticides, herbicides and other harmful substances are used in the cultivation of agricultural products, biodiversity is maintained and the principles of sustainable agricultural production are followed.

The allocation of special fields for growing raw materials for baby food is a standard practice for the world's leading brands. Officially, such areas are often called «special raw material zones» or «organic/ecological farms». Such zones exist in many countries with developed agricultural sectors and strict quality control standards (Table 2).

Table 2

Main countries with specialised raw material zones for baby food

Country/companies (brands)	Specialisation and types of raw materials	Characteristics and features of safety control
Germany, Austria, Switzerland Brands: HiPP, Holle.	A wide range of agricultural raw materials	Organic farming (Bio/Organic standards). Strict control: even the chemical composition of rainwater is checked.
Italy, Spain	Fruit (apples, peaches, plums), tomatoes, cereals	Specialised plantations for European puree and cereal factories.
Poland, Hungary, Czech Republic Nestlé, Danone/Nutricia.	A wide range of agricultural raw materials	Farming in accordance with EU standards. Powerful bases with huge certified areas.
New Zealand, Ireland, the Netherlands Brands: Aptamil, NAN, Nutrilon.	Raw materials.	Ecological pastures. "Reference milk" for the production of dry mixes.

The main factors in the quality and safety of such raw material zones are long-term (3 to 5 years) soil preparation before obtaining a Bio/Organic certificate, including cleaning from pesticide and agrochemical residues, as well as the use of natural fertilizers and biosecurity. These fields must be isolated from industrial facilities, motorways and landfills. Baby food producers enter into direct long-term contracts with farmers, fully controlling the process from sowing to harvesting.

Prior to the cancellation in July 2022 of the Cabinet of Ministers' Resolution «On Approval of the Procedure for Granting the Status of a Special Zone for the Production of Raw Materials Used for the Manufacture of Baby and Dietary Food Products», more than 80 farms in 14 regions of Ukraine (Vinnytsia, Volyn, Dnipropetrovs'k, Zhytomyr, Ivano-Frankivsk, Kyiv, Odesa, Poltava, Sumy, Kharkiv, Kherson, Khmelnytsky, Cherkasy, Chernihiv) had the status of a special raw material zone. In these areas, animal and vegetable products were grown for baby food production.

Against the backdrop of a fairly high share of imports, the position of Ukrainian baby food producers has strengthened tremendously. They are now competing with their foreign partners on the basis of price and availability. An analysis of the baby food market shows that 11 companies are currently leading the domestic production of these products.

Khorol Milk and Baby Food Cannery LLC (Khorol, Poltava region) remains the only enterprise in Ukraine specialising in the production of milk powder for infants in the first days of life (TM Malyuk, Malyutka) and baby water TM Malyuk, which is recommended for children from the first days of life for constant consumption. Since milk dust is generated during the spray drying of milk, the facility is equipped with modern cyclones and filters that capture fine product particles, preventing their emission into the environment. Additionally, due to the use of large volumes of industrial water, the plant utilizes CIP (Clean-in-Place) systems that facilitate wastewater pre-treatment. The enterprise is certified under the ISO 14001:2015 environmental management system.

Odesa Baby Food Canning Plant JSC (Odesa) is a long-standing leader in the canned fruit and vegetable segment, specialising in the production of fruit and vegetable purees, juices and nectars for children (TM Chudo-Chado, Malyatko). The plant's environmental impact centers on water and energy consumption for sterilization (local filtration units for wastewater pre-treatment; modern pasteurizers and sterilizers help reduce gas and electricity usage), and maintaining the Zero Waste concept (fruit and vegetable pomace from juice production is diverted to animal feed or fertilizer production; separately collected paper, polyethylene, and glass cullet are sent for recycling).

FDI Econia LLC (Zolotonosha, Cherkasy region) is one of the first companies in Ukraine to produce children's water with a focus on environmental friendliness (TM Malyatko, Akvulya, Chytyi Klyuch, YODO, DIVO VODA). Today it has representative offices in Slovakia and Cyprus. As of 2025, the company produces a full cycle of baby food (biscuits, porridge, mashed potatoes, juices under the Malyatko brand). This facility was designed and built from the ground up, ensuring full compliance with modern environmental standards. The Cherkasy region is traditionally considered an agricultural area with a low industrial footprint, eco-location. For packaging, the enterprise uses only BPA-free food-grade plastic and implements lightweighting technologies for plastic bottles.

Yagotynsky Butter Plant, Yagotynske for Children branch (Zgurivka, Kyiv region) produces a full range of dairy products for children aged 6 months and over under the Yagotynske for Children brand. 40 % of the Ukrainian baby milk market belongs to this manufacturer. The enterprise serves as a benchmark for Ukraine in terms of environmental safety (CIP systems for wastewater treatment, sorting and transferring packaging waste for recycling, and the implementation of the ISO 14001:2015 environmental management system).

Lustdorf LLC (Illintsi, Vinnytsia region) is a major producer of baby milk and milkshakes (Selyanske, Burienka, Na Zdorovye). Lustdorf is actively implementing environmental changes, namely the eco-friendly Tetra Gemina packaging with the innovative HeliCap™ 26 Pro non-removable lid. The new format of the lid can significantly reduce environmental pollution and reduce CO_2 emissions to 1.4 million tonnes of equivalent by 2030.

PrJSC Prydniprovsky Plant (Dnipro) is a long-standing leader in the production of baby dairy products (Zlagoda Malyatko TM). The Zlagoda plant was one of the first in Ukraine to widely use eco-friendly packaging. An

innovative example is the Lean Pack flexible packaging, which contains natural minerals (particularly chalk) that accelerate its degradation. Since the plant is a large industrial facility in a densely populated area, it is constantly under the supervision of municipal environmental authorities.

Firm Favor LLC (Kyiv) produces 7 types of dairy and fermented milk products for baby food (TM AMA, A-MAM). In 2020, the company successfully confirmed its naturalness and received the right to use the word «Natural» and the «Natural Product» labelling mark (certificate № UA.08.002.513). «Favor» makes a significant environmental contribution by developing energy-efficient and clean production, has an environmental certificate in accordance with ISO 14024 and a food safety management system certificate, confirming the low environmental impact of its products. In 2023 and 2025, the company confirmed the compliance of its products with environmental criteria, receiving awards from the Ministry of Environmental Protection and Natural Resources of Ukraine and the independent certification body Living Planet.

Municipal Enterprise «City Dairy Factory-Baby Food Kitchen» (Kharkiv) is the only enterprise in the city that produces liquid and paste-like dairy products for children from 6 months of age. Despite the city's frontline status, it continues to provide the region with fresh therapeutic and preventive nutrition. The enterprise is implementing a strategy for transitioning to a circular economy. The central kitchen is the only one in Ukraine that has preserved a returnable glass container system for baby food.

Wise Food Processing Company LLC (Dnipro) produces dairy-free baby food based on cereals for children from 6 months and more than 20 types of instant cereals. The company is part of the organic food segment. The primary production method is extrusion, which, from an environmental standpoint, is one of the «cleanest» methods of processing raw materials. The installed high-capacity exhaust systems and cyclone filters prevent dust dispersion into the ambient air of the city's industrial zone.

HIPP-Uzhhorod LLC (Zakarpattia region) is an important logistics and production centre for HiPP, which specialises in organic raw materials, herbal teas and juices. The company is a distributor in Ukraine of organic baby food TM Hipp and Bebivita, as well as baby cosmetics TM Babysanft. As part of the HiPP Group, Hipp-Uzhhorod LLC makes a significant environmental contribution based on the principles of sustainable development, namely, actively reducing CO_2emissions; using energy-efficient technologies; environmentally friendly office and advertising materials, paper and writing utensils; introducing eco-friendly packaging; implementing measures to protect climate and water resources, supporting biodiversity and environmental conservation projects.

Modern baby food production is accompanied by a significant environmental footprint - from greenhouse gas emissions at the farming stage to microplastics left over from packaging. Pollution of soil, water and air with heavy metals, pesticide residues, nitrates and mycotoxins affects the environmental safety of the raw materials.

Many infant formulas are based on cow's milk. According to international studies, the production of 1 kg of milk powder produces about 4 kg of CO_2equivalent. In addition, the supply chain (from growing animal feed to producing milk) requires thousands of litres of fresh water [14].

Baby food production plants produce wastewater that is highly toxic to water bodies, containing high concentrations of total nitrogen, lactose (up to 0.25 %) and milk fats, which leads to a critical reduction in oxygen in water (chemical oxygen demand can reach 1700 mg O_2/dm^3), which, if not properly treated, causes blooms and fish kills.

Sophisticated packaging used for preservative-free baby food, such as soft pouches (sachets with lids) and multilayer plastic packaging, is virtually impossible to recycle. Therefore, billions of such bags end up in landfills every year, where they decompose into microplastics.

In 2020, the European Union adopted a comprehensive Farm to Fork plan to create a sustainable ecological food system and new regulations on packaging waste. The plan is to make all packaging recyclable or reusable by 2030. European manufacturers are investing in the development of mono-materials for baby food (spiders made of one type of plastic that can be recycled) [10].

For example, Danone and Nestlé are implementing the principles of regenerative agriculture to reduce methane emissions at dairy farms. To solve the problem of packaging, some European manufacturers cooperate with innovative recyclers (such as TerraCycle), which create

special collection points exclusively for children's pouches, recycling them into outdoor furniture or building materials [15].

In the current environment, Ukraine is witnessing a deterioration in the overall environmental situation. Large areas of contaminated and mined land as a result of military operations, as well as the intensified use of agrochemicals, pose risks of contamination of raw materials. Therefore, environmental aspects of domestic baby food production are a key factor in the safety of the finished product.

The Law of Ukraine «On Waste Management» in the new version of 02.03.2026 launches a mechanism of extended responsibility of baby food producers, namely the introduction of mandatory funding for the collection and recycling of their packaging. Domestic juice and puree factories must modernise their own treatment facilities (aerotanks and biofilters) to prevent organic waste from being discharged into the municipal sewerage system [16].

In 2025–2026, Ukraine and the EU countries underwent extremely important legal and regulatory changes that directly affect the safety of packaging, environmental labelling and control of the safety and environmental friendliness of baby food products. This indicates a significant shift in the vector of environmentalisation at the legislative level towards the harmonization of Ukrainian legislation with the European one.

In particular, the implementation of Regulation (EU) 2025/351 has set new, much stricter criteria for the environmental safety of plastic materials (microplastics and chemicals from containers) that come into contact with infant food (purees and formulas) in order to minimise the migration of unintentionally added substances (NIAS). In addition, the updated guidelines of the State Service of Ukraine on Food Safety and Consumer Protection pay special attention to the transparency of labelling and environmental labelling of baby food, which is an integral part of ensuring its safety in the face of today's environmental challenges [17, 18].

The Verkhovna Rada of Ukraine adopted as a basis the draft Law «On Amendments to Certain Legislative Acts of Ukraine on Bringing Ukrainian Legislation in the Field of Baby Food in Line with the Requirements of EU Legislation» № 4554 (adopted on October 21, 2021; entered into force on May 13, 2022), which aims to bring Ukrainian legislation in the field of production and circulation of baby food in line with the requirements of EU legislation. Specifically, in 2022, the Law of Ukraine «On Baby Food» has become null and void; significant changes regarding the regulation of quality, safety, and labeling specifics in the field of baby food have been made to the Laws of Ukraine «Fundamentals of Ukrainian Legislation on Health Care» (dated November 19, 1992, No. 2801-XII), «On Basic Principles and Requirements for Food Safety and Quality» (amended in 2014), «On State Control over Compliance with Legislation on Food, Feed, Animal By-products, Animal Health and Welfare» (dated May 18, 2017, No. 2042-VIII), «On Consumer Information Regarding Food Products» (dated December 6, 2018, No. 2639-VIII) and «On Advertising» (dated July 3, 1996, No. 270/96-VR).

Environmental labelling is a statement that indicates the environmental aspects of the production or content of a particular product. It can be presented in the form of phrases, symbols or images on labels or packaging, in technical documentation, advertising materials, etc. The purpose of environmental labelling is to confirm verified information about the environmental characteristics or benefits of a product. The general principles and methods of its application are set out in the international standards of the ISO 14020 series «Environmental labels and declarations», which have been implemented into the Ukrainian national standardisation system by means of an identical translation and are directly applicable (DSTU ISO 14020 series) [19].

As for the labelling of baby food with ecolabels, this most often refers to certificates of organic production, which guarantee that the raw materials are grown without pesticides, chemical fertilisers and GMOs, and that there are no artificial colours or preservatives. The following labels can be found on baby food products available on the domestic market:

– *Euro-leaf* is the official EU organic label that guarantees that products meet strict EU organic farming and animal husbandry standards (HiPP, Gerber Organic);

– *Bio-Siegel* (Germany) is a national German mark that often accompanies the Euro-leaf on the label (HiPP, Bebivita);

– *The State Mark of Organic Products* (consisting of two circles forming a yellow-blue leaf) – confirms the product's compliance with the Law of Ukraine «On Basic Principles and Requirements for Organic Production, Circulation and Labelling of Organic Products» (products of LLC FDI «Econia») [20, 21].

Domestic producers often use the so-called ***greenwashing***, a marketing ploy that makes consumers believe that a product is environmentally friendly or organic, when in fact it is not. Most often, fake eco-labels are used on baby food, such as «Eco product», «Ecologically clean product», «ECO», etc. Some baby food producers stylise the labels as large green eco-signs and place them in the most visible place [22, 23].

In Ukraine, the Law of Ukraine «On Basic Principles and Requirements for Organic Production, Circulation and Labelling of Organic Products» (№ 2496–VIII) prohibits the use of such terms without a certificate.

According to Article 34 of this Law, if a product has not undergone an official organic certification procedure, it is prohibited to use the following words or words with the same root in its labelling or advertising «organic», «biodynamic», «biological», «ecological», «organic», as well as any derivatives thereof, including the popular prefixes bio- and eco-.

In addition, there are laws in Ukraine that also protect consumers from environmental misinformation. The Law of Ukraine «On Information for Consumers on Food Products» prohibits the use of information that may mislead consumers about the characteristics or properties of a product. Under the Law of Ukraine «On Protection against Unfair Competition», the Antimonopoly Committee may fine a company if it attributes fictitious environmental performance to its product to gain an advantage over competitors.

In general, the terms «ecological», «organic», «bioproduct» and similar are often used synonymously, although there are certain peculiarities between them, depending on the legislation of a particular country. The choice of word also depends on the language of the country. Organic is more commonly used in English-speaking countries (UK, USA). Bio is a popular term in Germany, France and Italy. The term Eco is often used in Scandinavian countries.

In the European Union, according to Regulation (EU) 2018/848, the terms Organic, Bio and Eco are legally equivalent. In a broader international context (ISO 14024), «sustainability» can refer not only to the composition of food, but also to the environmental impact throughout the product's life cycle [23].

Thus, the introduction of an eco-labelling system (in particular, in accordance with the international standard ISO 14024) is one of the most effective preventive mechanisms for ensuring the safety of baby food products. Ecolabelling is an indicator that products have undergone an independent assessment of compliance with strict environmental criteria at all stages of their life cycle – from growing raw materials in environmentally favourable areas to using safe packaging. For the Ukrainian market, eco-labelling is not only a tool to increase the competitiveness of domestic producers in the domestic and European markets, but also a critical benchmark for consumers in choosing guaranteed safe products.

Conclusions

As the baby food market is particularly sensitive to environmental initiatives, many countries in Europe and the US conduct global surveys and analyses to monitor the safety and environmental friendliness of products for children. They are conducted by companies such as Nielsen, Mordor Intelligence, Grand View Research, as well as universities and research centers.

According to these studies, the most active consumers of organic products in Europe and the US are women aged 25–40 with children who care about the future of their families. They buy organic food, eco-friendly household chemicals, etc. for their children. This segment of consumers is receptive to information about the need to take care of their health and preserve the planet for future generations. Economic studies show that parents are willing to pay an average of 17-27 % more for certified organic baby food compared to conventional baby food [22].

In Ukraine, research on the consumption of organic baby food is conducted on a smaller scale. These surveys are usually initiated by certification bodies (Organic Standard), the Organic Initiative Association, the Living Planet NGO, the Pro-Consulting research agency, international donor projects supporting the organic sector, etc.

The results of sociological surveys show that Ukrainian families most often become interested in organic products when a child is born. However, consumers often get lost in greenwashing, which is why the level of trust in well-known European organic brands among Ukrainian parents is often higher than in domestic producers.

Today, leading a «green» lifestyle, being «ekofriendly», is becoming a global trend. Adherents of this philosophy consume environmentally friendly products, use energy-saving technologies and alternative energy sources, limit the

use of materials that have a negative impact on the environment, and support the Zero Waste concept, which aims to avoid polluting the planet and change people's lifestyles and mindsets.

Conflict of Interest

The authors declare no conflict of interest regarding the publication of this manuscript. Furthermore, the authors have fully adhered to ethical standards, including avoiding plagiarism, data falsification, and duplicate publication.

***Authors Contribution*:** all authors have contributed equally to this work.

AI Statement

In this study, generative artificial intelligence was not used.

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Н. І. ЧЕРЕВИЧНА[1], канд. техн. наук, доц.,
доцент кафедри готельного, ресторанного бізнесу і крафтових технологій
e-mail: nataliia.cherevychna@hneu.net ORCID ID: https://orcid.org/0000-0002-6660-5366
Харківський національний економічний університет імені Семена Кузнеця
пр. Науки, 9а, Харків, 61166, Україна

Д. П. КРАМАРЕНКО[1], канд. техн. наук, доц.,
доцент кафедри готельного, ресторанного бізнесу і крафтових технологій
e-mail: kramarenkodp@gmail.com ORCID ID: https://orcid.org/0000-0003-1353-686X
Харківський національний економічний університет імені Семена Кузнеця
пр. Науки, 9а, Харків, 61166, Україна

Н.І. ГІРЕНКО, канд. техн. наук, доц.,
доцент кафедри професійної освіти, ресторанного і туристичного бізнесу
e-mail: n.i.hirenko@gmail.com ORCID ID: https://orcid.org/0000-0001-6854-8257
Луганський національний університет імені Тараса Шевченка
вул. Віктора Новікова, 2, Лубни, 37500, Україна

ЕКОЛОГІЧНІ АСПЕКТИ ВИРОБНИЦТВА ПРОДУКТІВ ДИТЯЧОГО ХАРЧУВАННЯ

Мета. Дослідження сучасного стану ринку продуктів дитячого харчування в Україні з погляду на екологічні аспекти виробництва, управління якістю та безпечністю сировини та готової продукції, питання екологічного маркування та гармонізації вітчизняного законодавства у сфері дитячого харчування з європейськими нормами.

Методи. Системно-структурний, абстрактно-логічний, статистичний метод, методи індукції, дедукції, порівняння, а також системно-аналітичний метод.

Результати. Наведено вітчизняну (товарознавчу та медичну) та європейську класифікацію дитячого харчування. Визначено, що 64 % українського ринку складає імпортні продукти (переважно бренди Nestlé, Danone, HiPP), які мають переваги завдяки використанню спеціалізованих європейських сировинних зон. Надано характеристику вітчизняних виробників дитячого харчування, які складають певну конкуренцію імпортним аналогам. Відзначено, що деякі з них впроваджують екологічні інновації у виробництво та пакування. Висвітлено вплив новітніх законодавчих змін 2025–2026 років щодо екологічного маркування, контролю безпечності та екологічної чистоти продуктів дитячого харчування. Це свідчить про суттєве зміщення вектору екологізації на законодавчому рівні у бік гармонізації українського законодавства з європейським. Досліджено проблему грінвошингу в Україні та дієвість вітчизняної законодавчої бази у боротьбі з неправомірним використанням псевдоекологічного маркування.

Висновки. Підтверджено, що впровадження системи екологічного маркування є ключовим превентивним механізмом гарантування безпечності дитячого харчування. Світові та українські соціологічні дослідження демонструють високий попит на органічне дитяче харчування. Проте поширення грінвошингу знижує довіру українських покупців до локальних брендів на користь європейських. Подолання цієї проблеми та орієнтація на концепцію «Zero Waste» і сталий розвиток є критично важливими для підвищення конкурентоспроможності вітчизняних виробників.

КЛЮЧОВІ СЛОВА: *дитяче харчування, екологічна безпека, екологічне маркування, спеціалізовані сировинні зони, грінвошинг, органічна продукція, європейська інтеграція*

Конфлікт інтересів

Автори заявляють, що конфлікту інтересів щодо публікації цього рукопису немає. Крім того, автори повністю дотримувалися етичних норм, включаючи плагіат, фальсифікацію даних та подвійну публікацію.

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В роботі не використано ресурс штучного інтелекту.

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