Determination of the Level of Products Novelty Importance for Developing Product Innovative Policy

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Abstract. To substantiate the range of products of the enterprise there is a need to assess the potential of products in terms of the company's ability to manufacture these products, consumer opportunities to meet their needs for these products, and market opportunities to ensure a strategic position among similar products. The study used structural-logical and causal methods of analysis to determine the structure of the novelty of goods. The numerical method of multi-criteria decision making TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) was used to rank the product range of new products according to the level of importance of novelty. Weights of individual components to assess the importance level of novelty in the enterprise were determined by the method of analysis of hierarchies of T.L. Saati. The study used the classification of novelty by its functional focus, according to which consumer, market, and manufacturing novelty of goods are distinguished. The importance of novelty for the manufacturer is the conformity of the product to its innovative development strategy, determination of its place in the market, and prospects for further activities. The importance of the novelty of a new product for the company is proposed to be defined as a measure of the importance of the novelty level of the product for the development of the optimal product range in the product innovative policy of the enterprise. To assess the level of significance of the novelty of goods, criteria of novelty by its types were proposed. According to the results of the study it was found that industrial novelty characterizes the level of use of new technologies in the enterprise, market – the position of a new product on the market among analogues, and consumer – the level and way to meet consumer needs. Further research should relate to the development of appropriate guidelines for the formation of product range and its management based on the assessment of the level of significance of novelty

Keywords: novelty, novelty importance, level of novelty, level of novelty importance, product innovative policy

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INTRODUCTION

The development of a product innovative policy at the enterprise is one of the priority tasks for achieving the main goal of the enterprise – to increase profits. The definition of a product innovation strategy and ways to develop and implement a product innovative policy depend on many factors: the manufacturing industry, market share, internal capabilities of the enterprise, the level of competition, the purchasing power of potential buyers, the life cycle of manufactured goods, etc. The development of the company's product innovative policy is dynamic and requires constant monitoring of new requirements, opportunities, and achievements in the field of enterprise activity.

Making a decision to release a new product for any company is difficult and quite risky. When bringing another new product to the market, the manufacturer believes that the novelty that the new product is endowed with is sufficient for the consumer to perceive. However, the consumer and the manufacturer may perceive the novelty of a new product ambiguously, and the result of such ambiguity is that the novelty will not stay in the market, that is, there will be a situation of its complete failure [1].

Today, there is no single comprehensive system for classifying the types and levels of the novelty of goods. Existing approaches address only some aspects of this classification. The most universal and appropriate method for developing a methodology for determining the overall level of importance of product novelty is the classification of novelty according to its functional orientation. Elements of classification by functional orientation are covered in the studies of E.I. Nahornyi [1], Yu.S. Shiryaeva [2], P.R. Dixon [3], N.S. Kubyshyna, and A.P. Stasevych [4], E.M. Popovych, N.S. Kubyshyna [5], A. Lau, R. Yam, E. Tang [6], P. Sarkar, A. Chakrabarti [7].

The manufacturer expects that the level of novelty of the product offered to the market will be evaluated by potential buyers and will lead to an increase in sales volumes. If a product is a big seller, improving or modifying this product is not as important for the manufacturer as introducing a new product or modifying and upgrading an existing one which may lose its position. Therefore, the identification of symptoms of possible deterioration of the novelty of innovative products is important for the development of the product innovation range of the enterprise.

The level of market novelty is determined by the unique properties of the product among similar products on the market. This is determined by the extent to which the product has competitive advantages in the market and how sustainable they are. Consumer novelty is developed in the mind of the consumer and characterises the measure and method of meeting one's existing and new needs. This is determined by how much the product characteristics meet the requirements and needs of the consumer, and how much consumers want

to purchase this product. However, in the scientific literature, the manufacturing, market, and consumer novelty of products that are planned to be put on the market are considered separately. Therefore, there is a need for a comprehensive analysis of the importance of product novelty from the standpoint of all three aspects: manufacturing; market, and consumer.

The object of research is the level of novelty of new products that are planned to be introduced to the market; the assessment of the importance of novelty will help dairy enterprises substantiate the most effective product assortment portfolio when developing a product innovative policy.

The purpose of the study is to construct methodological tools for assessing the level of importance of novelty in the context of the development of product innovative policy on the example of dairy industry enterprises.

LITERATURE REVIEW

Numerous researchers from different perspectives considered the problems of the novelty of goods, the research was aimed at determining the classification features of new goods and types of their novelty and innovations, the methodological foundations for the development of a commodity innovative product range.

J.-J. Lamben [8] considered in detail the issues of industrial marketing from the standpoint of creating value for the consumer, managing relationships with consumers and a trademark, developing new value propositions. He considers the development of consumer value for new products and its place in developing a product innovative policy.

F. Kotler, G. Armstrong, D. Saunders, W. Wong [9] to a greater extent considered the market aspect of the development of the product innovative policy of the enterprise. This is an issue of developing a new product from the standpoint of ensuring its competitiveness and substantiating the competitive strategies of the enterprise.

G. Sun, R. Govind [10] established that the level of product diversification in the market can cause positive and negative effects in the company's activities. They considered the market aspect of product diversification and suggested determining the level of its feasibility and dependence on the level of market turbulence.

T. Brzęczek [11], having considered the issue of expanding the product range, offers a methodology for analysing the company's product portfolio based on sales forecasting and assessing the effectiveness of product diversification. He established that the decision to introduce a new product or discontinue it from manufacturing should be grounded not by financial performance indicators, but from the standpoint of forecasting sales volumes. This determines the market aspect of the feasibility of introducing the product to market.

S.M. Ilyashenko [12], S.M. Illiashenko, Y.S Shypulina, N.S. Illiashenko [13] examined the content of the product innovative policy of the enterprise and the methodological basis for choosing priority areas for its development, considering the internal and external conditions of innovation activity at the enterprise. Special attention was paid to substantiating the modification of the product range from the standpoint of its development life cycle. The criteria for assessing the product range includes the following: the level of demand, the level of profitability, the level of risk, adaptive capabilities, the level of competitiveness and the use of strategic potential. These five assessment criteria cover mainly the market and consumer aspects of introducing new products to the market.

V.M. Kobelev, O.S. Proshutya [14] considered the success factors of introducing a new product to the market, among which the leading place is occupied by competitive strategies.

E.I. Nagorny [15] proposed a methodology for assessing the novelty of innovative products and products that have been on the market for a long time. The proposed methodology is based on determining a set of properties of innovative products that characterise its radical change relative to its market counterpart.

N.S. Kubyshyna, A.P. Stasevych [4] proposed a model for launching a new product on the market for a milk processing enterprise based on the use of tools for developing a product range and the concept of a new product. In general, the proposals relate to the development of a product and market strategy for a new product.

M. Nieto, L. Santamaría [16] noted that radical innovations are critical factors for product success in the market, and the level of product innovation is considered as the level of its novelty. The authors considered the role of a cooperative strategy, the type of partner, and the variety of shared networks to achieve a higher level of novelty of innovative products.

W.-L. Hsieh, P. Ganotakis, M. Kafouros, Ch. Wang [17] examined the level of innovative novelty from the standpoint of the type and geographical location of partners, and in the context of whether the enterprise is engaged in open or closed innovations.

J. Qiu, X. Li, Y. Duan, M. Chen, P. Tian [18] and R. Chan, Z. Li, D. Matsypura [19] considered the issues of developing an assortment policy and optimising it for trade enterprises from the standpoint of determining its consumer value.
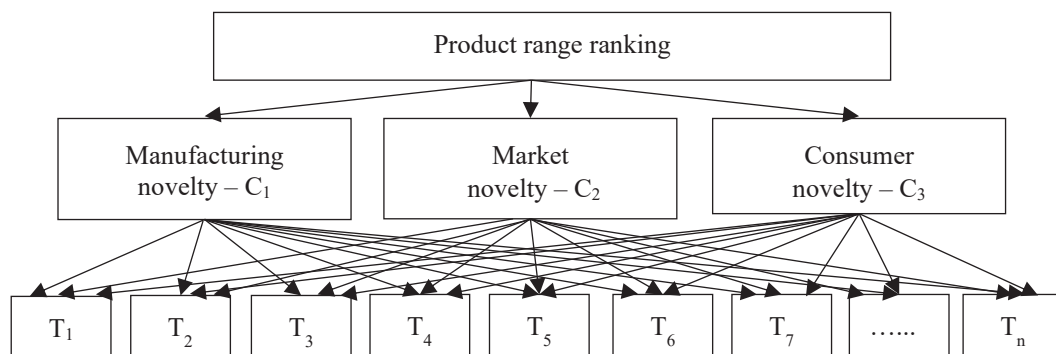
D. Tok, X. Chen, X.-Y. Chu [20] considered the factors that influence the consumer's evaluation and choice of goods, the market value of the goods.

J. Richetin, E. Demartini, A. Gaviglio, E.-C. Ricci, S. Stranieri, A. Banterle, M. Perugini [21] conducted a study of food attributes that are important to the consumer, focusing on various manufacturing processes labelled as "conventional" or "industrial". Thus, they considered the value of the product in terms of its technological capabilities.

Nevertheless, special attention should be paid to solving the problem of determining the level of importance of the product novelty as its quantitative characteristic for further use as a tool in marketing testing of a new product and deciding whether to expand or discontinue its manufacturing.

MATERIALS AND METHODS

To achieve the purpose set, it is proposed to rank the product range of the enterprise that is planned to be launched on the market, in terms of determining the level of importance of novelty. To rank the product range of new products, the TOPSIS (Technique for Order of Preference by Similarity to Ideal Solution) method was used, which is one of the numerical methods for making multi-criteria decisions. The TOPSIS method was first developed in 1981 by C.L. Hwang, K. Yoon [22; 23]. This method is based on the statement that the chosen alternative should be the closest to the ideal best solution and the farthest from the ideal worst solution. This method allows comparing many alternatives based on several criteria. TOPSIS has a simple mathematical apparatus, in addition, using computer support, it is a fairly convenient practical method. Figure 1 schematically shows the hierarchy of the task of ranking the product range of new products at dairy enterprises by the level of importance of novelty for the enterprise.

Figure 1. *Hierarchy of the task of ranking the product range of new products by the level of importance of novelty for the development of product innovative policy*

Source: *created by the authors*

Table 1 shows the scale of the point assessment of the level of the market, manufacturing, and consumer novelty and the characteristics of the importance of novelty to rank the product range.

Novelty levels	Interval of the novelty indicator
Radical novelty (pioneer product)	[0.81-1.00]
Clear, substantial novelty	[0.64-0.80)
Satisfactory novelty	[0.38-0.63)
Minor novelty	[0.21-0.37)
Dubious novelty	[0.00-0.20)

Source: *built based on [24]*

To develop an effective methodology for determining the level of importance of novelty, it is necessary to perform the following tasks:
– determine novelty types;
– select determining factors for each type of novelty;
– select appropriate measurement indicators for each type of novelty;
– define formulas for calculating the level of novelty;
– make payments;
– make the results on each type of novelty for calculating the integrated indicator consistent;
– analyse the obtained research results and develop managerial influences regarding the work with the analysed assortment.

After determining the structure of different types of novelty for new products and establishing their main characteristics, which are most important when introducing a new product to the market, the level of importance of novelty by its types is determined. The desirability scale of E. Harrington is used to rank and interpret the indicator of the general level and individual structural components of novelty importance (Table 1) [24]. This scale belongs to the psychophysical ones, it is used to establish a correspondence between physical and psychological parameters.

According to the TOPSIS methodology the multi-criteria assessment of the priorities of the importance of identified new products occurs in the following sequence of stages:

First step. Development of a scale for identifying goods by the level of importance of novelty by its individual components (Table 2). A questionnaire was created to assess each component of novelty. The working group consisted of 12 experts with appropriate competencies and powers. Technologists, marketers, managers, and specialists in various fields of activity of dairy enterprises took part in the survey.

Level of importance of novelty	Characteristics of novelty importance by criteria		
	(C_1) manufacturing	(C_2) market	(C_3) consumer
[0.00; 0.20)	Modification of the parameters	The product does not have the market novelty present in competitors, demand falls	Change in consumer habits
[0.02; 0.37)	Improvements and minor parameter changes	The product is not unique, some competitors have it in their portfolio, demand is stable	Change in the level of satisfaction of a need
[0.37; 0.63)	Substantial parameter change	The product has certain functional advantages over similar ones, demand is growing	Change in the way of meeting a need
[0.63; 0.80)	Qualitative transformation of functions and operating principle	The product differs considerably from similar products on the market, demand is growing	Creation of a new need
[0.80; 1.00]	The emergence of qualitatively new functions and operating principle	There are no analogues of the product on the market, yet demand is forecasted	Attraction of a new consumer

Source: *compiled by the authors*

The second step. The normalisation of the matrix of certain assessments (i.e., obtaining a dimensionless matrix) by the formula:

$$t_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{n} x_{ij}^2}} \quad (1)$$

i – number of analysed products; $i=1...n$; j – the number of criteria used to assess new products, $j=1...3$.

As a result of behavioural normalisation, a normalised dimensionless matrix in which all values vary from 0 to 1 is obtained.

The third step. Normalised assessments are weighted according to the weight coefficients of the criteria for the types of novelty of goods. The weight of the assessment criteria is also determined by experts as a result of the survey conducted.

$$T_{ij} = t_{ij} w_{ij} \quad (2)$$

w_j – weight j – of criterion for assessing the type of novelty of the product $j=1...3$.

Fourth step. Calculating the squares of distances to T_j^+ (maximum value T_{ij} by j) and T_j^- (minimum value T_{ij} by j). As a result, S_i+ and S_i- is calculated for each product according to the formulas:

$$S_i^+ = \sqrt{\sum_{j=1}^{n}(R_{ij} - R_j^+)^2} \quad (3)$$

$$S_i^- = \sqrt{\sum_{j=1}^{n}(R_{ij} - R_j^-)^2} \quad (4)$$

The fifth step. Risk rating using the formula:

$$R_i = \frac{S_i^-}{S_i^- + S_i^+} \quad (5)$$

Similarly, a multi-criteria assessment of other risks is conducted. The consistency of experts opinions was checked by the concordance coefficient using the formula:

$$K_{con} = \frac{12 \cdot \sum_{j=1}^{n} d_j^2}{m^3(n^3 - n) - m\sum_{i=1}^{m} T_i} \quad (6)$$

$$d_j = S_j - \frac{\sum_{j=1}^{n} S_j}{n} \quad (7)$$

$$S_j = \sum_{i=1}^{m} R_{ij} \quad (8)$$

$$T_i = \sum_{l=1}^{L}(t_l^3 - t_l) \quad (9)$$

where n – number of parameters studied; m – number of experts; where L – number of groups of linked ranks; t_l – the number of linked ranks in each group.

The statistical value of the concordance coefficient is checked using the Pearson criterion, which is calculated using the formula:

$$\chi_p{}^2 = \frac{\sum_{j=1}^{n} d_j{}^2}{m \cdot n(n + 1) - \frac{1}{n - 1}\sum_{i=1}^{m} T_i} \quad (10)$$

Using an integral indicator of the level of novelty of a product, arbitrary goods for various purposes can be compared, and the level of innovative activity of the enterprise can be determined. Yet commonly, indicators of the level of importance of commodity, consumer and market novelty separately are much more useful. When developing and launching a new product on the market, the manufacturer will use different strategies depending on the values of these indicators.

RESULTS AND DISCUSSION

Determination of the novelty structure to assess the level of its importance

When substantiating the range of products that are planned to be introduced to the market, it becomes necessary to assess the potential of products in terms of the ability of the enterprise to manufacture these products, the ability of consumers to meet their need for these products, and the ability of the market to ensure the strategic position of products among similar products-analogues of competitors.

For that purpose, it is proposed to use the level of importance of product novelty. Therefore, it is necessary to clarify the content of the concepts "level of novelty" and "the importance of novelty" for new products that are planned to be launched on the market.

Level of novelty – a measure of the difference between a new product and similar products that are already known to the market and consumers.

Development and optimisation of the product range, determination of the location of a new product is one of the main tasks of the company's product innovative policy. Each product group in general and each product in particular occupy a certain place and are important for the enterprise. The Explanatory Dictionary of the Ukrainian language edited by I.K. Bilodid defines the term "important" as having an outstanding value; serious [25]. For the manufacturer, all products are important, otherwise, they would have been discontinued, each product has its own level of importance.

Product importance for an enterprise is proposed to be defined as a measure of the importance of manufacturing goods in accordance with the achievement of the main goal of the enterprise's activity and ensuring competitive advantages.

The level of importance of novelty for certain types of products is often a more informative indicator for assessing and making decisions about certain actions in relation to this product.

The criteria for determining the level of importance of a product from the standpoint of an enterprise can be the following:
- the product is a brand identity of the TM;
- share of goods in total manufacturing;
- profit from the sale of goods;
- product novelty;
- availability of raw materials;
- sales network;
- logistics network;
- market segment.

The share of each assortment group of goods and each product separately at the enterprise is determined depending on demand, manufacturing capacity, availability of raw materials, profit from sales and other factors. By introducing a new product to the market, the manufacturer determines and evaluates its place in its product range and in the market. In addition to the presence of novelty in the product, the importance of this novelty for the manufacturer, its compliance with innovative development strategy, the establishment of its place in the market, and prospects for further activity are crucial [26].

Importance of novelty of a new product for an enterprise is proposed to be defined as a measure of the importance of the level of novelty of the product for the development of an optimal product range in accordance with the product innovative policy of the enterprise. The importance of the novelty of the same new product for different enterprises may vary, depending on the position of the enterprise in the market, on the state of material and technical support, image, position among competitors in the market, etc.

Analysis of researchers' approaches to determining the importance of types of novelty has shown that the most appropriate way to develop a methodology for determining the overall level of novelty of a product is to classify novelty according to its functional orientation. According to this criterion, consumer, market, and manufacturing novelty of the product is distinguished, the characteristics of which are shown in Table 3.
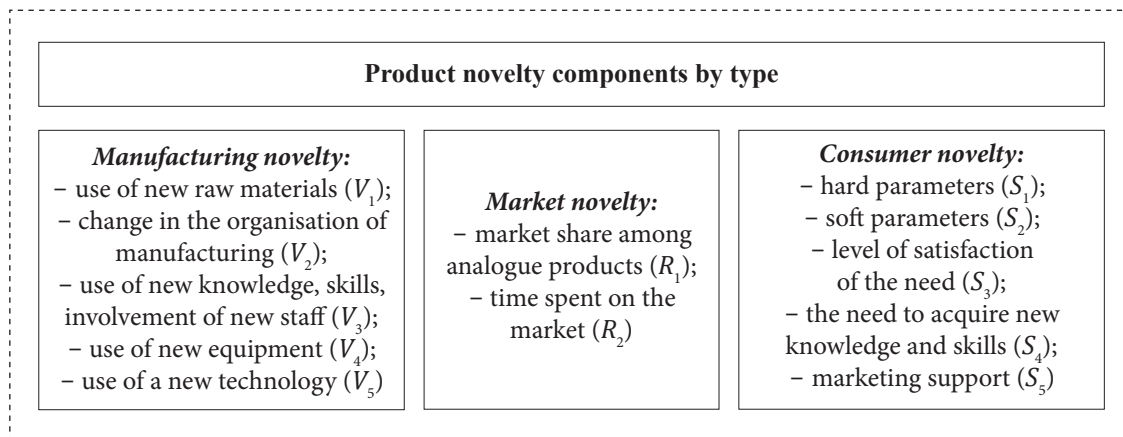
***Table 3**. Main characteristics of product novelty by its types*

Feature	Types of novelty		
	Manufacturing	**Market**	**Consumer**
Content	Characterises the level of use of new technologies, a new way of organising manufacture, and new raw materials in the manufacture of goods	It is determined by the share of a new product among similar products at a certain point in time and characterises the level of consumer awareness about the product and its properties	Characterises the measure and method of meeting existing and new consumer needs with a new product in comparison with previously known ones
The one who determines	**Manufacturer**	**Manufacturer and consumer**	**Consumer**
Assessment indicators	– organisation of manufacturing; – raw materials for manufacturing; – manufacturing technology; – external product parameters; – manufacturing equipment	– volume of advertising – list of trademarks, brands; – product image; – marketing campaign; – time and methods of information dissemination; – share among analogue products; – volume and geography of sales markets; – emergence of the next new product	– appearance; – price; – consumer properties; – level of satisfaction of the need; – quality; – safety; – after-sales service; – receptor properties (taste, smell, touch); – symbolic and status characteristics; – aesthetic qualities

***Source**: developed based on [6-7]*

The overall novelty importance indicator should be calculated using novelty importance indicators for each of its types separately since in most cases they have different values and indicate different advantages of new products. Therefore, it is necessary to determine the main components of a particular type of novelty, that is, to form a structure of novelty of the product, based on which the importance of each type of novelty of the product will be assessed. To assess the level of importance of the novelty of goods, the proposed criteria for novelty by its types are presented in Figure 2.

Product novelty components by type

Manufacturing novelty:
– use of new raw materials (V_1);
– change in the organisation of manufacturing (V_2);
– use of new knowledge, skills, involvement of new staff (V_3);
– use of new equipment (V_4);
– use of a new technology (V_5)

Market novelty:
– market share among analogue products (R_1);
– time spent on the market (R_2)

Consumer novelty:
– hard parameters (S_1);
– soft parameters (S_2);
– level of satisfaction of the need (S_3);
– the need to acquire new knowledge and skills (S_4);
– marketing support (S_5)

***Figure 2**. Product novelty structure by components*

Source: *compiled by the authors*

Hereinafter the content essence of each component of the developed structure of product novelty by its types with the substantiation of the selected assessment criteria is considered.

Manufacturing novelty characterises the level of technological and technical changes in the product, the level of knowledge intensity, the need for new equipment, and accordingly, is in direct ratio to the invested funds, it is acquired during the manufacturing process. To understand the essence of this definition, the main stages and components of product manufacturing need to be considered.

Manufacturing is a set of interrelated labour and natural processes, as a result of which raw materials and materials are transformed into finished products. It provides for the availability of professional knowledge and skills and requires a complex combination of them with decisions, actions, is the main task of management, and an important area of investment in business, is responsible for most of the recruitment, the main means of meeting consumer requests, and is a decisive factor in the profitability of the enterprise and its development. To increase the competitiveness of finished products, the manufacturing process must add value to them.

Using a simple resource-product model, manufacturing is defined as a recycling process in which the cost of manufacturing a product that consumers need is added to the resource.

Resources for manufacturing are natural, human, and material, used for the manufacturing of finished products. Each of these types of resources has a certain number of properties, and the common property of all resources is scarcity, which results in a limited volume of manufacturing and the desire for their best use.

Determination of manufacturing novelty is the exclusive right of the manufacturer since only they have complete information about all the conditions of manufacturing goods, about the features of the organisation of the manufacturing process at the enterprise, about the manufacturing potential of the enterprise, so the group of experts that determines manufacturing novelty

should consist of specialists who created the product from its idea to promotion to the market. They directly affect the decision-making on putting new products into the manufacturing and discontinuing the manufacturing. To assess the manufacturing novelty of the product, the indicators shown in Figure 2 are used, which reflect the manufacturing potential of the enterprise for manufacturing new products.

Market novelty characterises, firstly, the market share, which is determined by the position of the product among competitors, the marketing complex, innovative methods of promotion and sale of a new product, secondly, the time to enter the market, which includes the speed of innovation activity, flexibility, and readaptation to rapidly growing and changing consumer requirements.

Thus, the main indicators that characterise the level of market novelty of a product are the time of product entry into the market and the share of projected sales volume (Fig. 2). The selected indicators best reflect the advantages of this product in the market and the opportunities to be implemented to expand the market share. These indicators denote the level of market development today and the possibility of its growth in the future. Moreover, the level of influence of these indicators correlates.

Consumer novelty characterises the product in terms of meeting a new need or other levels of satisfaction of the need. The rapid level of change in needs, their growth, and insistence are the main characteristics of the modern consumer. Accordingly, high requirements are put forward: to the marketing complex, product positioning, the creation of such a novelty in the product that will be perceived by the consumer. Important in this case is the preliminary development of consumer needs for this product and the subsequent desire to purchase it. Definition of *consumer novelty* is the most complex since each consumer subjectively perceives the level of change in a new product and assesses those properties of the product that cannot be measured by physical assessments.

The problem of quantifying the size or property of an object that is not measured in physical units was solved by researchers in qualimetry. Notably, the issue of a quantitative assessment of the quality level is simpler, since certain state standards and technical conditions for the manufacturing of each type of product are defined by law, that is, there is a certain standard for comparison. When determining the importance of novelty, there are no standards or certain regulatory requirements. The object of comparison is taken as the nearest product-analogue or a generalising image of the most similar products previously known to the consumer.

Regarding consumer novelty, a product can take a considerable place among a number of analogues and substitutes, that is, become competitive in the market, only being of high quality, meeting certain generally accepted quality standards. In addition, the product must meet the obvious expectations of the consumer: technically (the type of operation), aesthetically, and pricewise. Product quality in marketing is the level of satisfaction of the need, solving the problems of the consumer. Therefore, quality for the consumer can be assessed by a number of consumer parameters of the product, which are criteria for consumer novelty and will be used to assess it (Fig. 2).

Quite important and relevant is the issue of determining the level of novelty of a product, by its different types and by the general level of novelty, which would allow comparing not only homogeneous goods but also any arbitrary goods. The main reasons for the difficulty of finding this indicator are the lack of certain legal requirements and provisions for recognising a product as new, limited and insufficient information, subjectivity and relativity of researchers' estimates, and the time of existence of the product.

Innovative support for the development of product innovative policy of dairy industry enterprises

Dairy products are everyday goods, and an important role for the buyer is played by their image and brand name, habits, price level, the naturalness of components, quality, etc. As a rule, consumers prefer dairy products o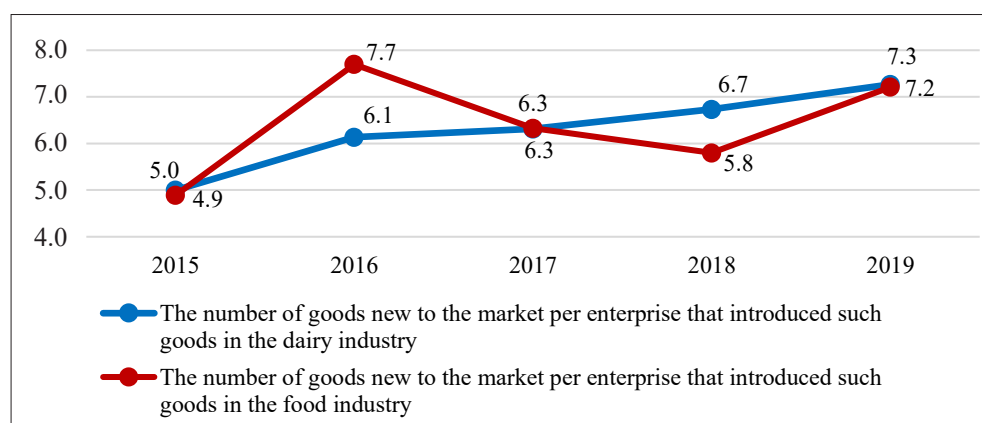f the same brand, and for them to change their habits, the level of consumer novelty should be noticeable or, with the same level of consumer properties and quality, the price should be lower.

Innovative products are divided into "new for the market" and "new for the enterprise". Over the past ten years, the food industry products in Ukraine, which are new to the market, accounted for an average of about a fifth of the innovative products sold [27]. Over the past three years, the dairy industry has consistently accounted for 11.4% of food products sold. The share of consumer spending on dairy products was about 15.0% of total food expenses, while the consumption of dairy products per person was less than 50% of the scientifically based standard [28].

The main trends in the development of dairy cattle breeding and the dairy industry in Ukraine are: 1) a decrease in milk manufacturing; 2) a decrease in milk consumption per person; 3) an increase in the average annual milk yield from one cow (over the past ten years – a doubling); 4) an increase in the level of profitability; 5) a stable level of self-sufficiency in milk.

The dairy market is highly competitive and differentiated, with a large number of assortment groups and assortment items in each. There are no radically new products. The main part of new products is modified and upgraded analogue products, in which consumer and/or functional properties have been changed to a certain extent.

Analysis of the innovative activity of dairy enterprises of Ukraine in 2015-2019 showed that the following trends can be noted: the volume of innovative products sold increased 1.9 times; the share of innovative dairy products in the entire dairy increased from 11.6% to 16.3%; the share of innovative dairy products in the food innovation industry was on average at the level of 11.4%; the share of innovative products of the dairy industry, which is new to the market, did not have stable dynamics, averaged 20% of all innovative products; the number of innovatively active enterprises was in the range from 23 to 31 enterprises (of which 15 to 26 enterprises introduced innovative products) [27]. The number of new products per enterprise that introduced commodity innovations in the food and dairy industries is shown in Figure 3.

Figure 3. *The number of new products per enterprise that introduced innovations in the food and dairy industries*
Source: *calculated by the Author according to the State Statistics Service [27]*

Determination of the level of novelty of new products was conducted according to the methodology developed by the All-Union Institute of Technical Aesthetics, which is proposed in the studies of V.F. Grinev [29], A.N. Romanov, Y.Y. Korlyugov, S.A. Krasilnikov [30] for five dairy industry enterprises (LLC "Lubenskyy molochnyy zavod", Dairy Company LLC "Galychyna", "Fh Tetyana 2011", LLC "Yagotynsky butter plant", LLC "Favor"). The novelty levels and innovative changes by the dairy product groups are shown in Table 4.

Table 4. *Innovative changes in dairy products of the studied enterprises in accordance with the level of novelty*

No.	Subgroup name	Change in product parameters according to the level of novelty			
		(0%; 20)	[20%; 30%)	[30%; 50%)	[50%; 70%]
1	Milk	New packaging	New packaging, new fat content, extended shelf life	–	Lack of lactose
2	Kefir	New packaging	–	Probiotic supplements, omega 3, new fermentation method	Lack of lactose
3	Yogurt	New packaging, addition of a different flavour	New packaging, new fat content, addition of new flavour, new density	Addition of probiotics, beneficial bacteria, new fermentation method, new thickness	Lack of lactose
6	Ice cream	New packaging	Addition of a new flavour	–	McShake liquid ice cream
7	Fermented milk products (dessert, drink)	–	Addition of a new flavour, new packaging	–	New product ayran, iolakton, herolakt, biolakt, new sour milk product

Source: compiled by the authors

During the study period, all enterprises actively introduced new products with different levels of novelty; products with a slight level of novelty – milk and butter in new packaging, yoghurts with the addition of new flavours. Most of these products were manufactured by LLC "Galychyna" and LLC "Favor". Products with a low and medium level of novelty – products with the addition of new flavours, packaging of a different level of quality and safety, the addition of various vitamins, bacteria, new fermentation methods, a considerable change in the consumption period. Such products were introduced by all the enterprises studied. Products with a high level of novelty – products that were first manufactured at the enterprise and given that dairy products of different manufacturers are very similar, they can be considered market novelty products: liquid ice cream, cream desserts, soft cheese, fermented dairy products for special nutrition, sourdough, herolakt, iolakton, ayran, lactose-free dairy products, goat's milk products, etc. The largest innovators in this segment were LLC "Yagotynsky butter plant" and "Fh Tetyana 2011". Qualitatively new products with a high level of novelty were not introduced into manufacturing.

Assessment of the level of importance of novelty of new products on the example of dairy industry enterprises

Hereinafter the importance of the novelty of new products using the TOPSIS method is considered. Criteria C_1, C_2, C_3 (Fig. 1) determine assessments of the importance of the novelty of a new product for the enterprise, respectively, manufacturing C_1 (technological change, level of manufacturing costs, quality, cost), market C_2 (characteristics of market attractiveness, marketing complex), and consumer C_3 (development of a new need, a new level of satisfaction of the need) changes.

At the first stage, the structure of novelty and its main indicators were determined to assess the level of importance of novelty of new products. The results of the study are shown in Table 3 and Figure 2.

To determine the weight of each component of novelty, the method of analysing the hierarchies of T.L. Saati is used [31]. According to this method, indicators for various criteria are compared using a nine-point scale. Comparing two objects A and B for priority or changes in a certain parameter of one of the objects, certain levels of the studied indicators and their corresponding preference ratings are highlighted (Table 5). Comparing assessments of changes in all indicators allows setting their priorities and provides them with a numerical assessment of advantage, which is a prerequisite for determining the level of novelty.

Enterprises differ in capacity, sales market priorities, and product range features, so the weight of criteria for assessing overall importance should be determined by experts for each enterprise separately.

Table 5. *Levels and assessments of changes and advantages of A and B objects*

Level of change between A and B	Assessment	Advantage level between A and B	Assessment
No change	1	Equally important	1
Minor change	3	Slight advantage of A over B	3
Considerable change	5	Considerable advantage of A over B	5
A clear change	7	A clear advantage of A over B	7
A clear absolute change	9	Absolute advantage of A over B	9
Intermediate change values	2, 4, 6, 8	Intermediate preference values	2, 4, 6, 8

Source: [31]

The proposed methodology was tested at dairy enterprise LLC "Favor" TM "AMA". This is a medium-sized dairy company that is not a market leader. The main competitive advantage is a niche position. Most of the products (75%) are marketed as medical products, for special dietary nutrition and infants. The main consumers are children's educational institutions, medical and health-improving institutions. Effective new methods of organising product promotion are delivery of goods to the consumer by own transport, an online store, various promotions and gifts for the holidays. The last year has shown the need to find new markets, as most educational institutions were closed during quarantine conditions. Therefore, the expansion of the delivery boundaries can be recommended (new consumers of health-improving institutions), online delivery.

The company is engaged in internal research as it has highly qualified personnel (1 professor and 2 candidates of technical sciences). The company uses technologies with a short (up to one day) consumption period while preserving all the nutritional properties.

Table 6 shows the weight coefficients of individual components for assessing the level of novelty importance at the Favor LLC.

Table 6. *Weighting factors w_j to assess the importance of manufacturing (C_1), market (C_2), and consumer (C_3) novelty of products of Favor LLC*

Enterprise	Weighting factors w_j			Coefficient of consistency of expert opinions
	Criterion C_1	Criterion C_2	Criterion C_3	
Favor LLC	0.225	0.324	0.451	0.621

Source: compiled and calculated by the authors

The second step. The normalisation of indicators for assessing the level of novelty importance is conducted using the formula (1). The study was conducted for 20 products of Favor LLC, the novelty characteristics and product coding are shown in Table 7.

Table 7. *Characteristics of novelty and coding of the studied types of dairy products of Favor LLC*

Product code	Product name	Novelty
$A_{3.1}$	"Naturel" yoghurt	Natural sourdough, new packaging
$A_{3.2}$	Plain yoghurt	New packaging
$A_{2.1}$	"Omega 3" kefir	New design, omega 3 added to the ingredients
$A_{1.1}$	"Kakao-moloko"	New packaging
$A_{9.1}, A_{9.2}, A_{9.3}$	Fermented dairy products "Do snidanku" with mushrooms, a mixture of herbs, paprika	New product with new cream-based flavours
$A_{6.1}$	"Albuminnyi" cheese	New product, 15 mineral elements, albumin
$A_{6.2}$	"Liubytelskyi" brine cheese with herbs	New taste
$A_{3.3}$	"Krem-briule z karamelnym smakom" yogurt	New taste
$A_{9.4}$	Fermented milk drink "Iolakton zi steviieiu"	A new product containing acidophilic bacilli, bifidobacterium, and streptococcus
$A_{3.4}$	"Strachatella" yogurt	New flavour with the addition of chocolate powder
$A_{10.1}, A_{10.2}, A_{10.3}$	Cream dessert "Karamel", "Horikhovyi", "Vanilnyi"	New product
$A_{3.5}$	"Polunytsia" cream yogurt	New fat content percentage
$A_{9.5}, A_{9.6}, A_{9.7}$	Sour-milk dessert with vanilla flavour, chocolate flavour, berry flavour	New product (new starter culture and flavours)
$A_{6.3}$	"Liubytelskyi" cheese with chilli pepper	New taste

Source: compiled by the authors

The third step. Normalised and weighted assessments of product novelty criteria normalised by formula (2) are presented in Table 8.

The fourth step is to calculate S_i+, S_i- squares of distances to R_j^+ (maximum value of R_{ij} by j) and R_j^- (maximum value of R_{ij} by j) by formulas (3) and (4). The calculation results are presented in Table 9. At the fifth step, new products are rated using formula (6). The results of product rating are presented in Table 9.

Table 8. *Normalised dimensionless assessment matrix for new products of Favor LLC according to established criteria*

Product code	Assessment criteria Normalised scores			Assessment criteria Weighted normalised scores		
	Market novelty (C_2)	Manufacturing novelty (C_1)	Consumer novelty (C_3)	Market novelty (C_2)	Manufacturing novelty (C_1)	Consumer novelty (C_3)
$A_{3.1}$	0.123	0.214	0.151	0.040	0.048	0.068
$A_{3.2}$	0.012	0.026	0.083	0.004	0.006	0.037
$A_{2.1}$	0.215	0.352	0.213	0.070	0.079	0.096
$A_{1.1}$	0.312	0.213	0.322	0.101	0.048	0.145
$A_{9.1}$	0.523	0.583	0.621	0.169	0.131	0.280
$A_{9.2}$	0.523	0.583	0.621	0.169	0.131	0.280
$A_{9.3}$	0.523	0.583	0.621	0.169	0.131	0.280
$A_{6.1}$	0.465	0.634	0.532	0.151	0.143	0.240
$A_{6.2}$	0.361	0.156	0.161	0.117	0.035	0.073
$A_{3.3}$	0.234	0.152	0.186	0.076	0.034	0.084
$A_{9.4}$	0.542	0.653	0.416	0.176	0.147	0.188
$A_{3.4}$	0.398	0.227	0.226	0.090	0.051	0.102
$A_{10.1}$	0.586	0.352	0.405	0.190	0.079	0.183
$A_{10.2}$	0.586	0.352	0.405	0.190	0.079	0.183
$A_{10.3}$	0.586	0.352	0.405	0.190	0.079	0.183
$A_{3.5}$	0.006	0.081	0.032	0.002	0.018	0.014
$A_{9.5}$	0.520	0.452	0.345	0.168	0.102	0.156
$A_{9.6}$	0.520	0.452	0.345	0.168	0.102	0.156
$A_{9.7}$	0.520	0.452	0.345	0.168	0.102	0.156
$A_{6.3}$	0.456	0.125	0.315	0.148	0.028	0.142
Weight	0.324	0.225	0.451			
maximum R_j^+	–	–	–	0.190	0.147	0.280
minimum R_j^-	–	–	–	0.002	0.006	0.014

Table 9. S_i+, S_i-, R_i *calculation results for ranking new products of Favor LLC*

Products	S_i+	S_i-	R_i	Rank
$A_{3.1}$	0.278	0.078	0.220	12
$A_{3.2}$	0.337	0.023	0.064	13
$A_{2.1}$	0.230	0.129	0.359	9
$A_{1.1}$	0.189	0.169	0.472	7
$A_{9.1}$	0.026	0.338	0.929	1
$A_{9.2}$	0.026	0.338	0.929	1
$A_{9.3}$	0.026	0.338	0.929	1
$A_{6.1}$	0.056	0.303	0.843	2
$A_{6.2}$	0.247	0.132	0.349	10
$A_{3.3}$	0.253	0.105	0.294	11

Table 9, Continued

Products	S_i+	S_i-	R_i	Rank
$A_{9.4}$	0.094	0.283	0.752	3
$A_{3.4}$	0.226	0.132	0.369	8
$A_{10.1}$	0.119	0.263	0.689	4
$A_{10.2}$	0.119	0.263	0.689	4
$A_{10.3}$	0.119	0.263	0.689	4
$A_{3.5}$	0.350	0.012	0.034	14
$A_{9.5}$	0.134	0.238	0.640	5
$A_{9.6}$	0.134	0.238	0.640	5
$A_{9.7}$	0.134	0.238	0.640	5
$A_{6.3}$	0.187	0.195	0.511	6

Source: calculated by the authors

Checking the consistency of experts' opinions on the concordance coefficient using formulas (6)-(9) showed that K_{1con}=0.612, K_{2con}=0.621, K_{3con}=0.701 which indicates a sufficient level of consistency of the experts' opinions.

The importance of the concordance coefficient was assessed by the Pearson consistency criterion using formula (10). For market, manufacturing, and consumer novelty, the value of the concordance coefficient is not random, and therefore the results obtained can be used for research.

According to the ranking, the level of novelty importance was determined, and products were divided into five groups in accordance with the Harrington scale. Table 10 shows the importance levels of the novelty of new products of Favor LLC.

Table 10. *Average rank of novelty importance of new products of Favor LLC*

Novelty importance levels	Product name	Average rank
Radical importance of novelty	$A_{6.1}$, $A_{9.1-3}$	1.5
Substantial importance of novelty	$A_{9.4}$, $A_{9.5-7}$, $A_{10.1-3}$	4
Satisfactory importance of novelty	$A_{1.1}$, $A_{6.3}$	6.5
Minor importance of novelty	$A_{2.1}$, $A_{3.1}$, $A_{3.3}$, $A_{3.4}$, $A_{6.2}$	10.0
Dubious importance of novelty	$A_{3.2}$, $A_{3.5}$	13.5

Source: calculated by the authors

The calculations made determined the product the novelty of which is most considerable for the enterprise. The analysis showed that the highest, "radical" and "substantial" importance were the products "Albuminnyi" cheese ($A_{6.1}$), fermented dairy products "Do snidanku" with different flavours ($A_{9.1-3}$), "Iolakton zi steviieiu" ($A_{9.4}$), "Desert kyslomolochnyi" with different flavours ($A_{9.5-7}$), "Krem-deserty" with different flavours ($A_{10.1-3}$). Therefore, when developing a product innovative policy, these products will provide the company with the best competitive advantages. For their manufacturing, the company has the appropriate manufacturing potential and expects to increase the volume of their manufacturing. "Kakao-moloko" ($A_{1.1}$) and "Liubytelskyi" cheese with chilli peppers ($A_{6.3}$) had "satisfactory" importance of novelty, they have a lower level of importance of novelty, but the manufacturer hopes that these products will be perceived as new for some time, so some marketing measures may be required to maintain their market position and extend their life cycle. "Minor" and "dubious" novelty values were "Omeha 3" kefir, "Liubytelskyi" cheese with herbs and various yoghurts ($A_{2.1}$, $A_{3.1}$,

$A_{3.3}$, $A_{3.4}$, $A_{6.2}$, $A_{3.2}$, $A_{3.5}$). Although there are many competitors in the market for these products, the manufacturer has its own consumer and expects the corresponding volume of product sales. For such products, marketing measures to retain customers of such products or develop a strategy to withdraw them from the market and replace them with others can be proposed.

For the studied enterprise, the most considerable is consumer novelty, since most of the products of TM "AMA" are dietary, medical, and designed for consumption in children's institutions. Therefore, the company should aim its efforts in the area of creating and consolidating the loyalty of its customers, considering changes in their habits, anticipating new needs, and attracting new consumers.

CONCLUSIONS

Testing of the proposed methodology for assessing the level of importance of product novelty was conducted at the milk processing enterprise Favor LLC for 20 types of its innovative products in the context of determining their manufacturing, market, and consumer novelty.

According to the results of the analysis, it was discovered that on average, consumer novelty prevails for all innovative products of the enterprise, market novelty is in second place, and manufacturing novelty is in third place. Expert assessment of the importance of these novelty levels in the overall assessment of the importance of novelty conducted according to the method of T.L. Saati showed a similar result.

A relatively high level of consumer novelty indicates the existence of a loyal consumer of the company's products. Ultimately, everything is decided by the consumer, while meeting their needs and preferences, which are determined by eating habits and sometimes unstable tastes, is a crucial goal for the development of any enterprise. Favor LLC primarily fosters its efforts on the development of consumer needs. The highest consumer level of novelty among the studied products is in fermented dairy products "Do snidanku" with mushrooms, a mixture of herbs, and paprika, and in "Albuminnyi" cheese. These products get the highest advantage among consumers, do not require considerable marketing and innovation support. The company understands the target audience and knows what functional properties of these products can ensure consumer loyalty.

The average level of importance of market novelty for all the studied products of Favor LLC occupies the second position after consumer novelty. Market novelty characterises the competitive position of the company's products among similar ones that are represented on the market. This is largely determined by the competitive advantages of products, using which the company wins in the market. Cream desserts "Karamel", "Horikhovyi", and "Vanilnyi" received the highest level of importance of market novelty. These products are considerably different from those offered by competitors, and therefore create unique opportunities for the enterprise to expand market share and provide a sustainable competitive advantage in the long term. For that purpose, it is necessary to expand consumer awareness about the useful properties of these products and form new distribution channels.

Manufacturing novelty takes third place in terms of the average level of importance of twenty innovative products of Favor LLC. Manufacturing novelty reflects the level of innovation in the manufacturing at the enterprise, namely equipment and technological processes. Thus, it shows how close the manufacturing process is to the best practices of dairy manufacturing. The highest level of importance of manufacturing novelty was given to the fermented milk drink "Iolakton zi steviieiu" and "Albuminnyi" cheese. For the manufacturing of these products, the company uses advanced technologies and modern equipment.

The generalised level of importance of the market, manufacturing, and consumer novelty of Favor LLC products was calculated using a multi-criteria assessment of the TOPSIS method. The results of the analysis showed that the top five included fermented milk products "Do snidanku" with mushrooms, a mixture of herbs, paprika, "Albuminnyi" cheese, and fermented milk drink "Iolaktion zi steviieiu". These products occupy a crucial place in the product innovative policy of the enterprise under study. The top five outsiders included cream yoghurt "Polunytsia", "Naturel" yoghurt, plain yoghurt, "Krem-briule iz karamelnym smakom" yoghurt, and "Liubytelskyi" brine cheese with herbs. These products require grounded decisions regarding their manufacturing and sale by the enterprise.

This method of assessing the level of importance of product novelty can become a powerful tool for substantiating the product innovative policy of an enterprise. This applies to solutions for timely delivery and decommissioning of products, preliminary testing of the product before introducing it to the market. In addition, this method allows determining the disadvantages and advantages for each type of innovative product in the product innovation portfolio of the enterprise in the context of its manufacturing, market, and consumer novelty.

This technique can be used by enterprises of various industries in different markets. For that reason, it is necessary to specify indicators for assessing the market, manufacturing, and consumer novelty which will reflect the features of the activities of specific enterprises in specific markets.

Further research should concern the development of appropriate methodological recommendations for the creation of the product range and its management based on the assessment of the level of importance of novelty.

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Визначення рівня значущості новизни продукції для формування товарної інноваційної політики

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Анотація. Для обґрунтування асортименту продукції підприємства виникає необхідність оцінити потенціал продукції з точки зору можливості підприємства виробляти дану продукцію, можливості споживачів задовольняти свою потребу у цій продукції і можливості ринку щодо забезпечення стратегічної позиції продуктів серед аналогічних товарів-аналогів конкурентів. У процесі дослідження використовувався структурно-логічний і причинно-наслідковий методи аналізу для визначення структури новизни товарів. Числовий метод прийняття багатокритеріальних рішень TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) використовувався для ранжування товарного асортименту нових товарів за рівнем значущості новизни. Вагові коефіцієнти окремих складових для оцінки рівня значущості новизни на підприємстві визначались за методом аналізу ієрархій Т.Л. Сааті. У дослідженні було використано класифікацію новизни за її функціональною спрямованістю, відповідно до якої виділяють споживчу, ринкову та виробничу новизну товару. Значущість новизни для виробника означає відповідність товару його інноваційній стратегії розвитку, визначення його місця на ринку та перспектив подальшої діяльності. Значущість новизни нового товару для підприємства пропонується визначати як міру важливості рівня новизни товару для формування оптимального товарного асортименту в товарній інноваційній політиці підприємства. Для оцінки рівня значущості новизни товарів були запропоновані критерії новизни за її видами. За результатами дослідження було встановлено, що виробнича новизна характеризує рівень використання нових технологій на підприємстві, ринкова – позицію нового товару на ринку серед аналогів, а споживча – рівень і спосіб задоволення потреб споживача. Подальше дослідження має стосуватись розроблення відповідних методичних рекомендацій щодо формування товарного асортименту і управління ним на основі проведеної оцінки рівня значущості новизни

Ключові слова: інновації, товарний асортимент, ринкова новизна, споживча новизна, виробнича новизна, товарна інноваційна політика