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MODERN TECHNOLOGY OF PRODUCTION AND STRATEGY OF PROMOTION OF NEW CEREAL PRODUCTS ON UKRAINIAN CONSUMER MARKET

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Abstract. In the article, based on analysis of the market of dry breakfasts in Ukraine and calculations of the assortment of instant and quick-cooked cereals, which are implemented in trading networks of Odessa and Odessa region, it was established that studied supermarkets can not provide stable, complete and wide assortment of products to fully meet needs of consumers. This means that it is necessary to carry out various measures in the field of forming domestic assortment of instant and quick-cooked cereals and improving its structure. Purpose of work was to develop strategy for launching a new product on the market, namely instant and quick-cooked cereals, on the basis of assortment analysis, mapping of strategic groups and construction of differentiation scale to enhance competition and create useful product advertising. With help of strategic group cards it was discovered that domestic products are poorly represented in such segments as a wide assortment at low prices and average latitude of assortment at low prices, therefore these segments can be considered as strategic for domestic instant and quick-cooked cereals producers. Based on construction of differentiation scale by trademarks of instant and quick-cooked cereals, it has been established that strategy of promotion in creating useful advertising to increase the competition of new products by means of differentiation can become emotional and social motives that are not used or very little used by competitors: originality, fashion, trendset, morality, sexual attractiveness, fear, revenge, status, socialization, self-realization, freedom, involvement, co-creation. Obtained results indicate that market for consumption of instant and quick-cooked cereals in Ukraine is sufficiently "young", demand for this kind of products is constantly growing, therefore the development and implementation into production of high-quality instant and quick-cooked cereals and expansion of its range is very relevant. The article also proposes and improves the technology of production of cereal extrudates with high nutritional value based on different kinds of cereal crops and vegetable raw materials. A substantial expansion of the range of products of instant and fast cereals in the form of flakes, muesli, granola, couscous based on a mixture of extruded flour and grains of extrudates has been proposed.

Keywords: breakfast cereals, instant porridge and quick cooking, map of strategic groups, differentiation method, rational motives, emotional and social motives.

СУЧАСНА ТЕХНОЛОГІЯ ВИРОБНИЦТВА ТА СТРАТЕГІЯ ПРОСУВАННЯ НОВИХ ЗЕРНОВИХ ПРОДУКТІВ НА СПОЖИВЧИЙ РИНОК УКРАЇНИ

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Анотація. У статті на основі аналізу ринку сухих сніданків в Україні та розрахунків асортименту каш миттєвого та швидкого приготування, що реалізуються в торговельних мережах м. Одеси та Одеської області, було встановлено, що досліджувані супермаркети не можуть забезпечити стійкий, повний та широкий асортимент продуктів, щоб повністю задовольнити потреби споживачів. Це означає, що необхідно проводити різні заходи в області формування вітчизняного асортименту каш миттєвого та швидкого приготування та покращення його структури. Метою роботи було розробка стратегії просування на ринок нового продукту, а саме, каш миттєвого приготування, на основі аналізу асортименту, складання карти стратегічних груп та побудови шкали диференціації для посилення конкуренції і створення корисної реклами продукту. За допомогою карт стратегічних груп виявили, що погано представлені вітчизняні продукти в таких сегментах, як широкий асортимент при низькій ціні та середня широта асортименту при низькій ціні, тому ці сегменти можна вважати стратегічними для вітчизняних виробників каш миттєвого та швидкого приготування. На основі побудови шкали диференціації за торговими марками каш миттєвого та швидкого приготування встановлено, що стратегією просування при створенні корисної реклами для посилення конкуренції нової продукції за допомогою диференціації можуть стати емоціональні та соціальні мотиви, які не використовують або дуже мало використовують конкуренти: оригінальність, мода, трендсет, моральність, сексуальна привабливість, страх, помста, статус, соціалізація, самореалізація, свобода, співпричетність, співтворчість.

Отримані результати свідчать, що ринок споживання каш миттєвого та швидкого приготування в Україні є достатньо «молодим», попит на даний вид продукції постійно зростає, тому розробка та впровадження в виробництво но-

вих каш миттєвого та швидкого приготування підвищеної харчової цінності та розширення їх асортименту є досить актуальним. Також у статті запропоновано і удосконалено технологію виробництва зернових екструдатів з високою харчовою цінністю на основі різних видів зернових культур та рослинної сировини. Запропоновано суттєве розширення асортименту каш миттєвого та швидкого приготування у вигляді пластівців, мюслів, гранола, кускусів на основі суміші екструдованого борошна та крупки з екструдатів.

Ключові слова: сухі сніданки, каші миттєвого та швидкого приготування, карта стратегічних груп, метод диференціації, раціональні мотиви, емоціональні та соціальні мотиви, екструдування, технологія, зерно, рослинна сировина.

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Introduction. Formulation of the problem

Today consumers are seeking to buy first of all high-quality, delicious and useful dry breakfasts. Therefore, segment of high-quality dry breakfast with improved nutritional properties will be successfully developed. And the important moment in its development is marketing. Such products should be represented qualitatively to the final consumer, namely, from colorful and vivid packaging to a competent and accessible explanation of product benefits. In connection with this, research of the market of dry snacks of Ukraine and existing assortment of instant and quick-cooked cereals for its further promotion, improvement and expansion become relevant. We offer the technology of production of a wide range of grain ingredients for dry breakfasts, and to increase the competition of new products and their promotion to the domestic market method of differentiation.

Analysis of recent research and publications

In Ukraine the segment of ready-made dry breakfasts (muesli, cushions, flakes, figurines, instant cereals, etc.) began to actively develop in the beginning of the 2000s, whereas earlier it was confined to oatmeal quick-cooked cereals [1]. According to "Nestle's" annual report, the global dry breakfast market in 2016 amounted to 35 billion euros [2]. The main "strong leaders" of the world market of dry breakfasts: "Kellogg Co" – 35%; "The Jordans & Ryvita Company" – 10%; "PepsiCo Inc." – 8%; "Nestle" – 7.5%; "Cereal Partners Worldwide" – 6.9%; "Weetabix Food Company" – 6.4%; "Weetabix Ltd." – 5.7%; "TreeHouse Foods"; others – 20.5% [3].

By the volume of production and consumption of dry breakfasts, the leaders of the world market is North America, mainly the US, in 2016 approximately 70 thousand tons of dry breakfast were implemented, in the amount of 9.6 billion USD, representing 27% of world production. Western Europe is an important consumer of dry breakfasts: most of them are sold in countries such as Germany (18%), Switzerland (10%), France (8%), the Netherlands (5%). In 2015 the amount of dry breakfast in Eastern Europe amounted to 1.2 bln. USD, and in 2016 it was estimated 3.5 billion

USD, this was due to the growing interest of population in healthy lifestyle and emergence of new channels for selling products [4-6]. In Asia and Latin America dry breakfasts are implemented with the amount of 1.9 billion USD, while there is slower growth in sales than in Eastern Europe: due to low purchasing power, consumers have reduced their consumption or reoriented to low-cost segment products.

Trends in development of the Ukrainian market of dry breakfasts are characterized by varying intensity and focus [6]. In fig. 1 the volume of sales of dry breakfasts in Ukraine from 2010 to 2017 is given.

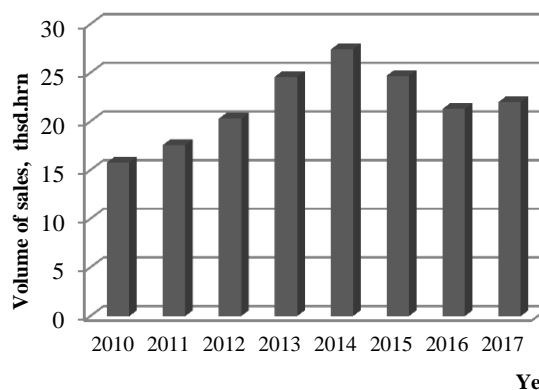


Fig.1. Sales volume of dry breakfasts in Ukraine

As can be seen from the data up to 2014 there is a constant increase in sales volume at the level of 10–15% (in 2014 it amounted to 27.4 thousand tons). In 2016, relative to 2014, the production of Ukrainian dry breakfast was reduced by 15%, amounting to 21.3 thousand tons. The decline in sales in 2015-2016 experts explain by the increase in prices for dry breakfasts, the decline in purchasing power. But from 2017 there is a slight increase in the volume of implementation.

The most significant producer of dry breakfasts in Ukraine is PLC "Nestle Ukraine" created on the basis of Boryspil Food Supplies Plant (TM "Fitnes", TM "Khrustka", TM "Gold"). The share of this company in the total production of domestic dry breakfast in 2017 amounted to 24%. The total sales of Nestlé in Ukraine in 2017 amounted to 4.016 billion

UAH, showing a growth of 30.5%. The second in the rating of producers is PJSC "Lantmannen Akxa" (TM "Zlakovo", TM "AXA", TM "Start"). The company's share in the total production of dry breakfasts in Ukraine in 2017 amounted to 20%. The company's success lies in the high quality of products, as well as use of the most contemporary equipment in production, ensuring European level of quality of dry breakfasts. TM "AXA" supplies a fifth part of products to the export [7].

"Sunny Food" takes the third place with a production volume of 18%. It is leading manufacturer of dry breakfast and healthy eating products. Nowadays the company takes a leading position in the market of muesli and crunch of Ukraine. Dnipropetrovsk Food Concentrate Plant occupies the fourth place in the ranking of the largest domestic producers. Share of the company in the total production of dry breakfasts in Ukraine in 2017 amounted to 15%. The main products are breakfast cereals, sweet sticks, salty snacks, fast food, confectionery and desserts. The special feature of the products produced under the trademarks "Zolote Zerno", "Saliut", "Hit Snack", "Smachna Zabava", "Slasti" is the preservation of its useful properties, natural, environmentally friendly raw materials through the use of special processing technologies. This allows to store virtually all vitamins, minerals and valuable ingredients, which make products not only tasty but also useful for health [8].

Company LLC "TERRA" produces products under TM "TERRA" and accounts for 9% of the total production of dry breakfasts in Ukraine. The company's leadership is driven by high quality of products, naturalness and accessibility through its own processing of Ukrainian grain, fruits and vegetables, as well as cooperation with leading global suppliers [9]. The main producers of dry breakfasts on the Ukrainian market are shown in fig. 2.

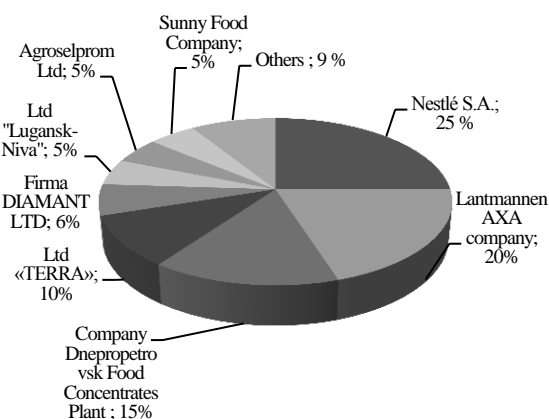


Fig. 2. The main producers of dry breakfasts in the Ukrainian market in 2017

According to the results of analysis there are about 7 competitive enterprises in the Ukrainian market occupying leading positions in the national and regional markets. The products of these enterprises are in the low and middle price segment and are available to a wide range of consumers.

Despite of apparent dominance in the market of Ukrainian-made dry breakfast, the fight for consumers is led by such companies as "Bruggen" (Germany), "McCann's Irish Oatmeal" (USA), "Nordic" (Finland), as well as Polish, Czech, Belarusian producers. The hardest competition occurs between the middle and upper price segments, although from the outset the imported product was positioned in the upper price segment of the market, and domestic analogues in it practically do not exist even to this day.

The most significant importers of dry breakfasts in the territory of Ukraine in 2017 were the USA, Moldova and Belarus, whose share in the total volume of imports of products was about 70%. The volume of dry breakfast imports into Ukraine is shown in fig. 3

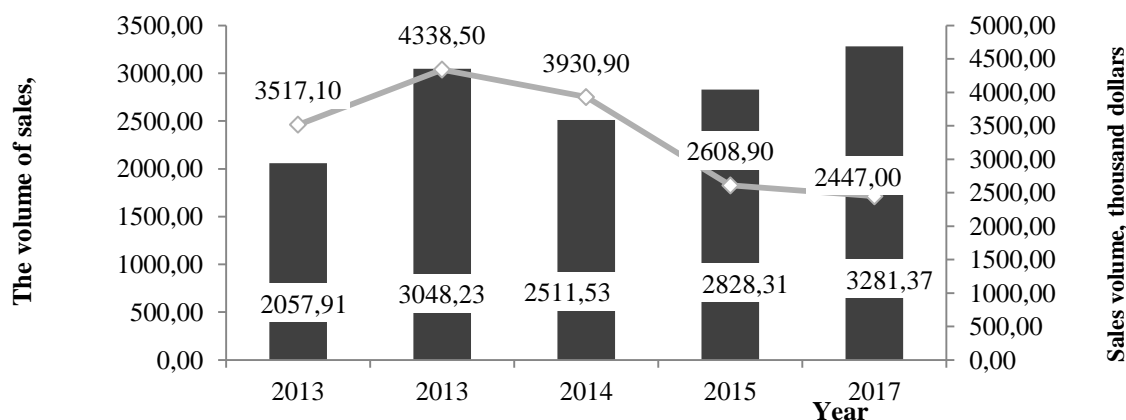


Fig. 3. The volume of imports of dry breakfast, in physical and value terms

As it is seen in 2013, the amount of dry breakfast imports into the territory of Ukraine amounted to 2057.91 tons, in 2014 the import of this type of

products increased by 1.5 times. Thus, the growth rate for the specified period amounted to 48%. In 2015 relatively to 2014 the growth rate of the indicator

decreased by 18%. And from 2016 there is decrease in the price per unit of production, as importers would lose further in sales volumes compared to Ukrainian products. Due to this volume of sales in kind began to grow by 14% every other year. In 2017 no fundamental changes occurred – the volume of imports in kind increased by 16% [10-12].

Imports of dry breakfast in value in 2016 decreased by 34% compared with 2015, and in 2017 - by 6%. The trend is explained both by decrease in price per unit of output and reduction of consumption of imported premium segment products.

The volume of dry breakfast exports for 2016 is estimated at 2447,00 thnd USD. USA. The largest exporters are Germany, Azerbaijan, Estonia and Kazakhstan. In total these countries accounted for 52.1% of world exports of dry breakfast [10-12]. Georgia is attracting special attention among other countries of the world where exports have almost doubled in the last 5 years. EU countries increased exports to foreign markets 1.6 times for the same period, and according to expert estimates of analysts USDA, its indicator last year amounted to 10 thousand tons. Exports of dry breakfast in real and value terms are shown in fig. 4.

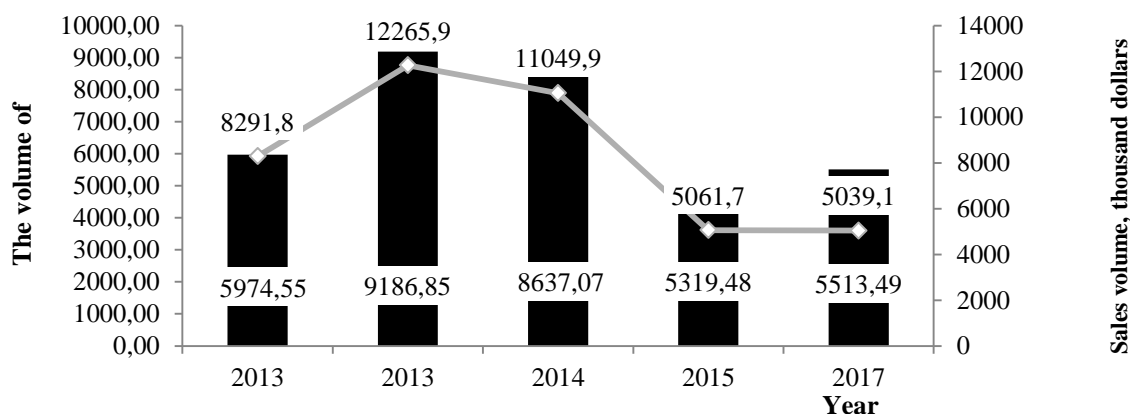


Fig. 4. The volume of exports of dry breakfast, in physical and value terms

In 2015 Ukrainian producers reduced sales of breakfast abroad by 6% in real terms. But in 2017, compared with 2016, the sale of dry breakfasts to foreign markets increased by 4%, while in 2016, compared with 2015, the decline in exports of dry breakfast was about 38%. Ukraine has expanded the supply of breakfast in real terms due to fairly low prices for products, which has caused demand in foreign markets. In 2016 the volume of exports in value terms decreased by 54%. In 2017, the value of dry breakfast exports decreased by 0.4%.

The indicated tendencies of state and development of the market of dry breakfasts in Ukraine in comparison with the relevant world market allowed to draw conclusions about the apparent potential of sale of new products on it: possibilities of expanding the range of consumers at the expense of those engaged in tense physical and mental activity; the revealed tendency of consumers' desire for healthy lifestyle and healthy eating.

Strengthening attention to healthy eating of the population in society attracts attention to products that can adequately meet physiological needs of person. Nowadays, there is a fairly wide assortment of instant and quick-cooked cereals in the trading networks, but first of all it is necessary to note what is the difference between instant and quick-cooked cereals. Currently, retail networks present a rather wide range of dry breakfasts such as fast and instant cooking cereals in

the form of cereal flakes and their mixtures, muesli, expanded grains, granola, couscous, etc. [13].

Instant cereals - are cereals cooked from five to ten minutes. Their production requires not whole grain, but flakes. The thinner the petals, the faster dish is cooked. The thickness of flakes for instant cereals is usually no more than 0.5-1.0 mm [14]. Basically, two technologies for the production of cereal flakes are common: grain peeling, hydrothermal processing of grain and its flattening, or grain peeling, hydrothermal processing, shattering, dispensing, and mixing with other types of flour obtained from vegetable raw materials [15]. Granola and couscous also refer to fast cooking cereals. Granola are obtained by baking the mixture usually consisted of oat flakes, nuts, and honey [15]. Couscous are obtained by rolling out manna groats in flour made of vegetable raw materials [16].

Quick-cooked cereals are cereals that do not require cooking. They are presented in the form of flour mixture or flakes, the thickness of which usually does not exceed 0,3–0,5 mm. Mandatory condition for this kind of cereal is hydrothermal treatment. Cereals are exposed to high temperature and pressure, then exposed to dry [14,15].

The purpose of the work was to develop a strategy for the promotion of a new product with high nutritional value on the market, namely quick-cooked cereals, on the basis of assortment analysis, mapping of strategic groups and construction of differentiation

scale to enhance competition and create useful product advertising.

Research Materials and Methods

Assortment analysis was carried out by calculating of latitude, completeness and product stability. In order to assess competition maps of strategic groups (MSG) of M. Porter were used which makes it possible to assess differences between enterprises not in market shares but in activity strategies. This analytical method involves analyzing the industry as a whole and evaluating the location of each company on the market separately [17].

Method of differentiation has been proposed to increase the competition of new quick-cooked cereals and their promotion to the market and creation of qualitative advertising [18]. For the construction of differentiation scale which serves as supervisory example of the use of motives in differentiating and assessing their level, we take for the base data provided in the market analysis and on official websites of enterprises and trademarks of quick-cooked cereals. It was rational to build a scale by trademarks of products. So on the axis Y motives are displayed, on the axis X – an estimate based on these motives. In the main field of the scale there are in fact trademarks of quick-cooked cereals depending on the relevance of motives and ratings (fig. 7).

Results of the research and their discussion

According to SSU 3993-2000 assortment of goods is a set of goods of different groups, subgroups, types and varieties, united on a certain basis to characterize the composition of the commodity mass in different conditions [19]. The assortment has its own properties that are objective features that are manifested in relation to the assortment in the process of its formation and in the process of sale of the product. Each property of the assortment, similar to the consumer properties of the product, is characterized by quantitative and / or qualitative indicators which include: indicator of latitude, completeness and stability of the assortment. In order to analyze the assortment of specific group of goods, to study its structure and in the future perspective to form it correctly it is necessary to determine the listed indicators [19].

The analysis of assortment of instant and quick-cooked cereals was carried out during 2017 in the major supermarket chains: "ASHAN", "Metro", "ATB", "Kopiika", "Sil'po", "Fozzy", "Tavria B", "Obhzora", "Virtus" of Odessa and Odessa region. On the basis of analysis it was found that supermarkets have a fairly wide assortment of instant and quick-cooked cereals, differing in composition of ingredients, weight, cooking, packaging, price, country of production (Table 1).

Table 1 - Characteristics of the range of instant porridge and quick cooking in terms of latitude, completeness and stability

The name of the chain stores	The number of varieties in the sale, a valid latitude	Latitude coefficient, (CL),%	The number of varieties available for sale, the actual completeness	Coefficient of completeness, (CC),%	The number of commercially available varieties in sustained demand	Coefficient of stability, (CS)%
Metro	10	71	34	76	4	29
ASHAN	9	64	30	67	3	21
Tavria B	7	50	27	60	3	21
Fozzy	6	43	25	56	3	21
Sil'po	6	43	23	51	2	14
Virtus	4	29	20	44	2	14
Kopiika	4	29	17	38	2	14
ATB	3	21	18	40	2	14
Obhzora	3	21	14	31	1	7

The latitude of range of trading networks serves as an indirect indicator of the market's saturation of goods: the greater the latitude, the greater the market saturation [20]. In general, in the analyzed trading networks of Odesa and region instant and quick-cooked cereals of 14 brands are sold: TM "AXA", TM "ECO", TM "TERRA", TM "Vasha kasha", TM "OVSYANUSHKA", TM "Dr. Benner", TM "Golden Kings of Ukraine", TM "Nordic", TM "Bruggen", TM "Nasha kasha", TM "McCann's Irish Oatmeal", TM "Kliuchi Zdorov'ia", TM "Novokasha", TM "Snack time". We take this value for the base (Shb), and the

actual (Shd) for each supermarket will be the amount that is implemented in it.

The data is shown in table 1 indicate that the assortment of instant and quick-cooked cereals is most widely represented in Metro trading networks (CE=71%), ASHAN (CE=64%), Tavriya B (CE=50%) which allows meeting needs of most consumers in instant and quick-cooked cereals, and in other analyzed supermarkets this indicator is much lower which indicates the unsaturation of the segment of this product in the trading networks and needs an expansion of the range.

Next indicator that was calculated is completeness of assortment - ability to set a homogeneous group of products to meet the same needs. The greater the completeness of the range, the higher the probability that the consumer demand for goods of a certain group will be satisfied [20]. According to table it was discovered that in Odessa and region instant and quick-cooked cereals with 45 different fillers are sold. In this way the basic completeness (Pb) is 45, and the actual number of varieties of instant and quick-cooked cereals (PD) is own for each trading network. Proceeding from this, the coefficient of completeness of assortment (CC) was calculated (Table 1). It is possible to make a conclusion that demand of buyers in the investigated trading networks is not completely satisfied. The range needs to be expanded to satisfy the needs of consumers.

The third and last indicator of the assortment was calculated stability of assortment. Stability of assortment is ability of a set of goods to meet demand for the same goods

[20]. The feature of such goods is presence of steady demand for them. The coefficient of stability shows the share of goods that is in constant demand. In the retail trade network of Odessa and Odessa region 14 trademarks of instant and quick-cooked cereals are sold (Table 1), with marketing research it was found that only 5 of them have the greatest demand among consumers: "AXA", "TERRA", "OVSYANUSHKA", "Nordic", "Bruggen". The obtained data show that the maximum possible stability of assortment - 29% of the trademarks of all that are in steady demand, can provide "Metro", "Tavria B" and "ASHAN" trading networks and the lowest stability of assortment is demonstrated by the supermarket "ATB" because this supermarket sells only one kind of cereal which is not characterized by steady demand.

To facilitate generalization of the data obtained during the analysis of assortment characteristics of instant and quick-cooked cereals we construct general chart of calculated indicators (fig. 5).

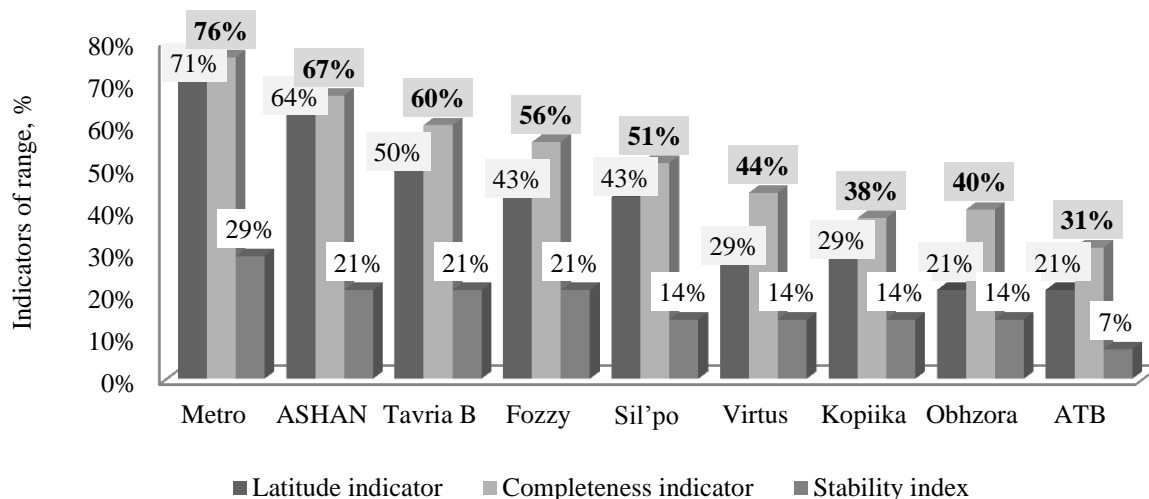


Fig. 5. Characteristics of the range of instant porridge and instant cooking

As can be seen from fig. 5 the most harmonious assortment of instant and quick-cooked cereals can be provided by supermarket "Metro".

By price level instant and quick-cooked cereals presented in the trading networks of Odessa and Odessa region can be divided into 5 categories. Cereals of trademarks belong to the category 1: "Nordic", "Snack time", "Golden Kings of Ukraine", "McCann's Irish Oatmeal", "Kelloggs" with the cost over 130 UAH for 1 kg. Cereals refer to the second category in the price range of 129-110 UAH / kg – of trademarks "Bruggen", "AXA", "Dr.Bonner", "Sante", "Terra", "Novokasha". The third category includes cereals within the limits of 109-90 UAH / kg - trademarks: "Vasha kasha", "Nasha kasha", "Ovsyanushka", "ECO", "Moya yizha". At a lower price (89-51 UAH) goods of the most popular trademarks "Kasha dobrogo dnya", "Rodnaya yeda", "Kasha Malasha" are offered. Last category 5 stands for instant and quick-cooked cereals of economy class (up to 50 UAH per 1 kg)

there are own trademarks of the investigated networks "Furshet", "Metro", "Sil'po", "Tavria B", "ASHAN" – "Aro", "Primiya", "Semyorka", "Subbota", "Eurogroup".

Among the methods for assessing competition in the market construction of MSG plays an important role in assessing the differences between enterprises not in the market share but in the activity strategies [18]. For clarity we will make MSG of M. Porter which will help to see competitors more accurately and which of them are closely located near the investigated trademarks of instant and quick-cooked cereals. The map will be constructed based on indicators such as latitude of assortment and price (fig. 6).

The MSG constructed allows to identify main strategic groups. Placing several strategic groups on the map means that the competition groups act on the market with different strategies; each of them uses its own techniques of competition and occupies a separate position in the market.

Price	High	
	Average	
Price	Low	
		<p>Narrow assortment Average breadth of assortment Wide assortment</p>

Fig. 6. Map of strategic groups

As we see in the average and low price segment, products of domestic manufacturer are mainly presented which are not always characterized by a wide range. In the high price segment products of import trademarks are predominantly sold with a wide range of products: "Nordic", "Snack Time", "Golden Kings of Ukraine", "McCann's Irish Oatmeal", "Kelloggs". This product is in high demand among consumers with high income and who take care of their health. Poorly presented domestic products in such segments as a wide assortment at low price and average latitude of assortment at low price, although these segments can be considered as strategic for domestic producers of instant and quick-cooked cereals. Wide possibilities of national raw material base and absence of customs payments can be attributed to the factor of providing low price for high quality and wide assortment. This testifies to the need to develop and introduce new products with improved consumer properties on the Ukrainian consumer market.

In order to increase the competition of new instant and quick-cooked cereals of domestic production and their promotion to the Ukrainian market we will analyze advertising of products by differentiation method based on the theory of motivation. Motive is internal psychological state that drives personality. It is based on goal achievement of which is associated with satisfaction of certain needs [20]. In other words, all motives are based on our needs and weaknesses.

Searching for creative idea of advertisement is associated with such motives which are accentuated in the advertisement of this product. To determine motives for differentiating the trademarks of quick-cooked cereals on the Ukrainian market, we used information which is presented by manufacturer on its official sites and in advertising. For analysis 19 trademarks of instant and quick-cooked cereals were suggested which are in demand with Ukrainian consumer (Nordic, Snack time, Golden Kings of Ukraine, McCann's Irish Oatmeal, Kelloggs, Bruggen, AXA, Dr. Bonner, Sante, Terra, NovoKasha, Vasha Kasha, Nasha Kasha, Ovsyanushka, ECO, Moya yizha, Kasha dobrogo dnya, Rodnaya yeda, Kasha Malasha).

After analyzing the obtained data and converting them into single differentiation scheme (fig. 7), we can say the following: with regard to the most rational motives involved, that are convenience, safety, additional benefits, health and profitability, among emotional and social motives - traditionalism, brand credibility, joy, love, pride and patriotism, lifestyle and environmental friendliness. On the presented scale of differentiation it is possible to see that there are quite a lot of groups of motives that are free or they are discovered at rather low level. The constructed scale of differentiation allows to highlight the main motives that are very widely used by manufacturers in their advertising to promote products. There are also emotional and social motives that are not used or very little used by competitors: originality, fashion, trendset, morality, sexual attractiveness, fear, revenge, status, socialization, self-realization, freedom, involvement, co-creation. And these incomplete groups of motives can be used in creating advertisement to increase the competition of new products through differentiation.

To enhance such components of consumer motivation as originality, fashion, and trendsetter, a widespread view of the beneficial effects on the health of biologically active substances of native food components, based on reliable scientific facts, may be used [21]. For example, such types of vegetable raw materials as topinambour tuber and chicory root are rich in inulin content [22,23], and pumpkin and carrot are rich in carotenoids content [24,25]. However, the widespread use of these natural components is tempered by a high moisture content (up to 80–85%), which requires the use of a drying process characterized by significant energy consumption and losses of biologically active substances [26]. In order to expand the range of products of dry breakfasts with high nutritional value, Odesa National Academy of Food Technologies has developed and proposed a process way of extruding mixtures of grain components and vegetable raw materials with high moisture content (up to 80–85%) by shattering of grains to a large fraction with particle size of up to 2–3 mm, shattering of root crops, fruits, or sprouted grains in a knife cutter, dispensing

and mixing of grain and vegetable raw materials within a ratio of 85–90 to 15–10%. The moisture content of such a mixture was determined at 17.5–18.2%. Mixtures were allowed to settle for 2,400–3,600 s and were fed to the extruder. At a temperature of 105–110°C and a pressure of 2.0–2.5 MPa, a porous product with a moisture content of 12.0–13.0% was formed. As a result, the finished extrudate was not subject to the drying process. The mixture was in the working area of the extruder for 20–25 s, which allowed avoiding significant losses of biologically active substances in the raw materials. The schematic diagram of the extrusion process is shown in Fig. 8. According to the diagram, the purified grain and vegetable raw material are brought to weight dispensers 1. After being weighted, root crops or fruits are shattered in the horizontal (2) or vertical (3) knife cutters. Weighted portions of the components are mixed in the blade mixer 4 and conditioned within it for 2,400–3,600 s for uniform redistribution of moisture. The finished mixture is brought to the extruder 6 by means of the screw feeder 5. The extrudate temperature at the outlet was 105–110°C. The product was brought to the horizontal cooler 7. The ob-

tained extrudate had the following dimensions: the diameter of the granules of the extrudate was 10–12 mm; the length was 30 to 50 mm. It was brought to the cutter 9 for preliminary shattering, and then through the electromagnetic separator 11 into the roller cutter 12. The shattered product was brought to the sieve separator 13, in which two sieves were installed: the upper one, the lattice screen No.30 with the mesh diameter of 3.0 mm; and the lower one, the lattice screen №10–20 with the mesh diameter of 1.0–2.0 mm, or the wire screen No.0.85–1,8 with the clear mesh size of 0,85x0,85–1,8x1,8 mm. Fractions obtained by the ascent of the upper sieve and the pass of the lower sieve are combined and brought to the roller cutter 14. The obtained extruded flour is brought to the hopper for finished products 15a; and the grain of extrudate is brought to the hopper for finished products 15b. Extruded flour based on grain components and vegetable raw materials is used to prepare instant cereals, supplementation of cereal flakes; and the grain of extrudate is used to produce fast cooking cereals, muesli, granola, and couscous.

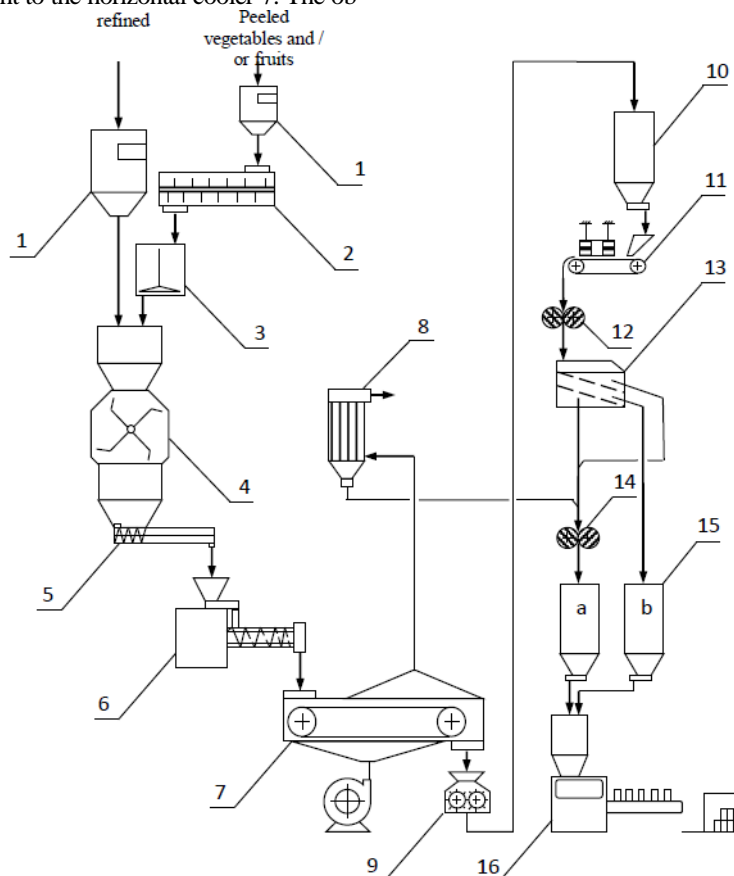


Fig. 8 – Schematic diagram of the technological process of production of extruded cereal products supplemented with vegetable or fruit ingredients:

1- weight dispenser; 2- horizontal knife cutter; 3- vertical knife cutter; 4- blade mixer; 5- screw feeder; 6- grain extruder; 7- horizontal cooler; 8- cyclone filter; 9- cutter; 10 - operational hopper; 11- electromagnetic separator; 12, 14- roller cutter; 13- sieve separator; 15- hoppers for finished products; 16- packing machine.

Conclusions

Based on conducted research on the market of dry breakfasts and calculations of the range of instant and

quick-cooked cereals sold in Odessa and Odessa region's trading networks, it was found that studied supermarkets could not provide stable, complete and wide assortment

of products to fully satisfy consumers' needs. This means that it is necessary to carry out various measures in the field of forming assortment of instant and quick-cooked cereals and improving its structure.

As consumption market of instant and quick-cooked cereals in Ukraine is sufficiently "young", demand for this kind of products is constantly increasing, therefore the development and introduction in the production of new instant and quick-cooked cereals of high nutritional value and expansion of its range is very relevant.

With the help of MSG it was discovered that domestic products are poorly represented in such segments as wide assortment at low prices and average latitude of assortment at low prices, therefore, it can be considered as strategic for domestic producers of instant and quick-cooked cereals. Based on the construction of differentiation scale by the trademarks of instant and quick-cooked cereals, it has been established that strategy of promotion in creating useful advertising to increase competition of new products by means of

differentiation can be emotional and social motives that are not used or very little used by competitors: originality, fashion, trendset, morality, sexual attractiveness, fear, revenge, status, socialization, self-realization, freedom, involvement, co-creation.

In order to significantly expand the range of products of instant cereals, the technology of producing grain extrudates as ingredients for obtaining dry breakfasts either in the form of cereal flakes and muesli or in the form of granola and couscous has been improved. The peculiarity of the enhanced technology is the possibility of adding up to 10–15% of native vegetable raw materials rich in biologically active substances (carrots; roots of parsley, celery, and chicory; pumpkins, topinambour, sprouted grains, sea algae, etc.) to the composition of the extruder, which allows not only to supplement the instant and fast cooking cereals with biologically active substances, but also to affect formation of taste qualities and nutrition values of the finished products.

	Rational motives			Emotional and social motives											
	Convenience	Additional advantage	Yield	The credibility of the brand	Originality	Traditionalism	Fashion	Morality	Joy	Love	Status	Pride, patriotism	Freedom	Involvement	Lifestyle
5															
4			McCann's Irish Oatmeal Bruggen	Nordic Bruggen								Nordic			
3	Bruggen	AXA	Nordic Kelloggs	Kelloggs AXA Dr.Bonner		Nordic Bruggen						McCann's Irish Oatmeal			AXA
2	Nordic Каша Малаша	Наша каша	Golden Kings of Ukraine	AXA		Snack time Наша каша	AXA		AXA		Наша каша	Golden Kings of Ukraine	AXA		Golden Kings of Ukraine
1	Sante	Nordic Моя їжа				НовоКаша			Sante		Овсянушка	Родная еда			
1	Ново-Каша	Терра							AXA				Терра		
2	Bruggen Терра	Ваша каша Моя їжа			Snack time	Nordic						AXA	Golden Kings of Ukraine		
3	Golden Kings												Nordic ЭКО		
4	AXA														
5															
	Health	Security		Innovations	Assimilation	Own importance	Trendsetters	Sex appeal	Fear	Revenge	Socialization	Self-realisation	Ecological compatibility	Joint creativity	

Fig. 7. Scale of differentiation for instant and instant porridge trademarks

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