

## Artículo de investigación

**Competitiveness of mayonesis of different producers in the local market of the city of Perm, Russia****Конкуренентоспособность майонезов разных производителей на локальном рынке города Перми, Россия**

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**Abstract**

The article presents a multi-component assessment of the quality and competitiveness of mayonnaise produced by different brands within the district market. The aim of the study was to systematize and evaluate mayonnaise brands in the Perm city market. To achieve this goal, it was necessary to study the quality of samples of mayonnaise trademarks; conduct market research to identify customer preferences; assessment of the competitive position of mayonnaise brands.

**Keywords:** Mayonnaise trademarks, sensory indicators of mayonnaise quality, packaging and marking quality of mayonnaise, a comprehensive tabular assessment method

**Аннотация**

Статья репрезентирует многокомпонентную оценку качества и конкурентоспособности майонезов, произведенных разными торговыми марками в пределах окружного рынка. Целью исследования являлась систематизация и оценка марок майонеза на рынке города Перми. Для достижения поставленной цели потребовалось исследовать качество образцов торговых марок майонеза; провести маркетинговое исследование по выявлению предпочтений покупателей; оценку конкурентных позиций марок майонеза. Научная гипотеза заключалась в предположении о том, что при использовании разных методов (метода сенсорного анализа, физико-химического метода, метода ценообразующих характеристик, метода комплексной табличной оценки) в качестве инструментов оценки конкурентоспособности результаты будут различными.

**Ключевые слова:** торговые марки майонеза, сенсорные показатели качества майонеза, упаковка и качество маркировки майонеза, метод комплексной табличной оценки.

**Introduction**

One of the areas of food commodity research is the study of promising food products—mayonnaise. In the works of L.G. Eliseeva, I.A. Zhebeleva, E.V. Zhiryaeva, O.I. Kazhaeva there is a commodity characteristics and technology for its manufacture (Eliseeva, 2014; Zhebeleva, 2016; Zhiryaeva, 2014; Kazhaeva, 2014).

Mayonnaise —the most popular flavoring products among Russians (Deunezheva, 2016). Mayonnaise is a product obtained by emulsification of vegetable oils with water, egg products, milk powder, sugar, salt, vinegar, mustard, spices and other special ingredients. In appearance, it resembles thick sour cream and is

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a concentrated oil-in-water emulsion. The egg yolk used for the production of mayonnaise serves as an emulsifier of a “protein-phosphatid nature, which accumulates low molecular weight and high molecular weight surfactants” (Starovoitova and Tereshchuk, 2018). However, according to L.N. Bulyginoy, M.R. Hollman, V. Olsson, Y.S. Kim, egg yolk can contribute to problems caused by improper heat treatment. “In practice, this leads to the fact that with increasing temperature or increasing pressure in the homogenizer, the egg yolk begins to dramatically lose its emulsifying properties, which leads to a disruption in the formation of the emulsion” (Budanina, 2016; Hollman, 2017; Olsson, 2018; Kim, 2017).

The aim of the study is to systematize and evaluate mayonnaise brands in the Perm city market. The scientific hypothesis was the assumption that when using different methods as tools for assessing competitiveness, the results will be different.

### Materials and methods

Quality determination was carried out by sensory analysis methods and physicochemical methods. Assessment of market positions of mayonnaise brands was carried out in two ways: using the method of pricing characteristics (value for money) and the method of integrated expert tabular assessment.

The objects of special research were 4 samples of mayonnaise from different manufacturers:

1. Provence olive Ryaba (JSC Nizhny Novgorod Fat and Oil Plant);
2. Mayonnaise Olive Maheev (JSC Essen Production AG);
3. Quail egg mayonnaise ORGANIC Mr. Ricco (NEFIS-BIOPRODUCT JSC);
4. Mayonnaise Provence EJC (JSC Fat Factory).

### Results and Discussion

According to physical and chemical indicators, sample № 4 Provence ELC does not meet the requirements of GOST, because the mass fraction of moisture exceeds the permissible values – 32.4%, with a norm of not more than 31%. In other mayonnaise samples, the mass fraction of moisture is within acceptable limits. The lowest moisture in the Mr. Ricco mayonnaise sample is 28.1%. In terms of acidity, a sample of Provence ELC mayonnaise is close to the maximum value of 0.88%. The smallest percentage of acidity in the Maheev mayonnaise sample is 0.24%.

Mayonnaise is not generally a healthy food, but it is one of the most nutritious foods. It contains a complex of substances necessary for nutrition of the body: proteins, fats, carbohydrates, minerals, etc. The presence of such flavoring substances as vinegar and mustard stimulates appetite and, therefore, helps to increase the digestibility of food, in which mayonnaise is used as a seasoning.

The first stage of the preliminary research was the study of packaging and the quality of marking for compliance with the requirements of GOST 31761-2012 (GOST 31761, 2012). During the study of the appearance of the packaging of mayonnaise from different manufacturers, it was revealed that the packaging of the samples was clean, intact, without any violations.

Further, the mayonnaise was checked for compliance with the requirements of GOST 31761-2012 for organoleptic indicators (GOST 31761, 2012). Deviations haven't found in mayonnaise samples in organoleptic, as well as physico-chemical characteristics.

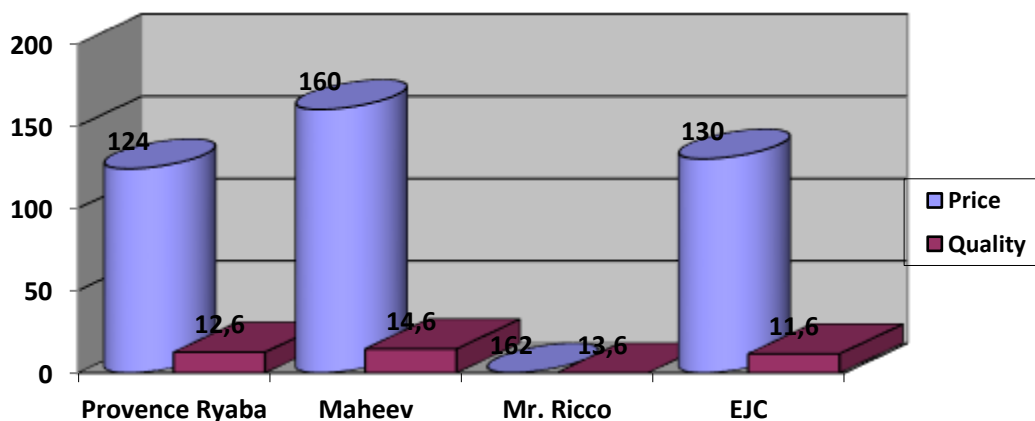
In more detail, differences in organoleptic indicators were evaluated during sensory evaluation-tasting (Katlishin, 2018) (table 1). As a result of a group expert assessment of the considered brands of mayonnaise in taste, smell, color, texture and appearance, the best results were obtained from the mayonnaises Maheev and Mr. Ricco.

**Table 1 – Results of sensory evaluation of mayonnaise from different manufacturers**

Name of indicator	Scale, Level, Score				Result, score, for brand mayonnaise			
	exc.	good	satisf.	not satisf.	Provence Ryaba	Maheev	Mr. Ricco	Proven ce EJC
Taste and smell	5	4	3	1-2	4,4	4,8	4,4	4,6
Appearance, Consistency	5	4	3	1-2	4,6	5	4,6	3,6
Color	5	4	3	1-2	3,6	4,8	4,6	3,4
Total	15-13	12-10	9-6	5-0	12,6	14,6	13,6	11,6

Given the real pricing, the cheapest but not the worst quality brand of Provence Ryaba mayonnaise came first. The second place was shared by Maheev (due to a good price-quality

ratio) and EJC (exclusively due to price). Despite the good quality of organoleptic tasting indicators, the most expensive mayonnaise Mr. Ricco was the least competitive (figure 1).



**Figure 1 – Visualization of the level of price and quality of mayonnaise**

To assess the competitiveness of mayonnaise, an analysis was carried out on the following grounds.

1. The fat content of mayonnaise was the same – 67%.
2. Packing. The studied samples of mayonnaise from different manufacturers, namely Ryaba, Maheev, Mr. Ricco, EJC, were packed in doypacks.
3. Product information. The most common are nutritional supplements, since many manufacturers, when listing additives,

4. The appearance of mayonnaise. Organoleptically determine the taste, color, smell, texture. Taste and smell forget to attribute code E. Also, manufacturers do not often specify vegetable oil. And consumers have to guess what it is: olive, sunflower or soy. Thus, additive E was not indicated in any sample. In the sample № 4 of the ELC there is no indicated oil, which have been used during production. There is a conformity mark on the packaging of Maheev mayonnaise, but other samples do not have them.

should be gentle, slightly sharp, sour, without traces of bitterness. The consistency should be uniform, such as thick sour cream, the presence of added additives, and single air bubbles are allowed. The color of mayonnaise is from light cream to yellow cream, uniform throughout the mass. According to the tasters, the highest score has Maheev mayonnaise. The lowest was EJC mayonnaise.

5. The price of the analyzed product for 1 kg / rub. Mr. Ricco – 162 rubles, Ryaba–124 rubles, “EJC – 130 rubles,

Maheev– 160 rubles. Thus, we can conclude that the cheapest mayonnaise sample is Ryaba, the most expensive is Mr. Ricco mayonnaise. When interpreting the results of evaluating this criterion by consumers, it is necessary to take into account the fact that buyers are, by their nature, largely subjective.

6. Fame of the brand. The result showed that the most famous sample is Maheev and Mr. Ricco. The least popular were the samples of Ryaba and EJC mayonnaise (table 2).

**Table 2 – the competitiveness of mayonnaise from different manufacturers**

№ /π	Sign	Ryaba	Maheev	Mr.Ricco	EJC
1	Fat	5	5	5	5
2	Packaging	5	5	5	5
3	Product information	3	4	3	2
4	Appearance	3	5	4	2
5	Price/quality	3	3	3	2
6	Brand fame	2	4	5	3
Total		21	26	25	19
Grade point average		3,5	4,3	4,2	3.2

Thus, we can conclude that according to the results of the index method, the Maheev mayonnaise has the highest competitiveness, followed by Mr.Ricco. Ryaba mayonnaise ranks third in terms of competitive position, the product of the EJC company has the worst competitiveness.

### Conclusions

1. Based on the results of our studies, we made the following conclusions: the mayonnaise in question fully complies with the requirements of GOST 31761-2012 in terms of organoleptic and physico-chemical parameters, as well as in marking and packaging requirements.
2. According to the quantitative expert evaluation of sensory quality indicators, the best results were obtained from the mayonnaises Maheev and Mr. Ricco. Therefore, these mayonnaises in this sequence can be recommended to wealthy consumers who do not take into account the cost of the product when making a purchase.

3. The current situation on the local market with consumer preferences (tabular method) speaks of the leading market positions of Maheev mayonnaise, on the second place is Mr.Ricco, and on the third place is Ryaba. EJC mayonnaise can be characterized as the least competitive in the market under consideration.
4. From the point of view of qualimetric assessment of the ratio quality and price indicators (price-quality method), it will be optimal for consumers to buy mayonnaise in the following ranked sequence: Provence Ryaba, Maheev and EJC. As recommendations to manufacturers, it should be noted that in order to increase the competitiveness of EJC mayonnaise, it is necessary to work with quality, taste indicators, as well as customer loyalty.

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