

Developing Safe Foods as a Competitive Mechanism

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Abstract. This article presents the results of a study of safety indicators, nutritional value and sales of bakery products obtained using progressive baking technologies. The purpose of the research is to determine the feasibility of production and sale of bakery products made using improved technologies, and to ensure the safety of products. The methods used in commodity science determined the quality indicators of bakery products, established the terms of implementation and indicators of food safety. Marketing studies of the use of malt preparations in dough science have shown a limited range of malts: fermented rye malt, roasted malt flour and malt extract. The market for bakery products of large retail chains and holdings, mini-bakeries and bakeries selling this group of food products is limited. Consumers aged 18 to 35 are in demand for the certain indicators of the quality of bread, characteristic of the types of used malt: soy, pea, triticale, rye, wheat, and barley. Bread and bakery products in the process of fermentation of dough and baking acquire non-traditional organoleptic characteristics inherent in legumes and cereals. Each developed type of bread and buns has found its consumer with specific, individual preferences.

1 Introduction

The modern food business must not only meet consumer expectations. It is necessary to emotionally connect the buyer with the product, to form a coalition of like-minded people, interested consumers. A low-quality product will cause a backlash, not only will it not be remembered, but will also act as anti-advertising to customers. The consumer remembers a very bad or excellent product, and the manufacturer's task is to create a feeling of "admiration", the stability of his brand.

The analysis of the experience of such marketing approach, reveals a tendency towards the development of food enterprise, which takes into account and develops the directions of satisfying the needs of the buyer, supports the initiative of marketers and technologists to improve the trading system and alliance with the consumer, and always turns out to be profitable in a competitive business [1,2].

In order for a food company to work effectively, it is required to choose such a goal and methods of its further production activities, such a position in relation to attracting buyers,

which cannot be disputed. The well-known economist and marketer J. Kay proposed progressive components with the help of which it is possible to establish the ability of an enterprise in a competitive struggle to create goods and services that dispose the consumer to make a purchase and involuntary advertising. This requires:

- timely and dynamically replenish and update the assortment and improve product quality;
- monitor and regulate the market, maintain the company's reputation at the proper level, providing it with advertising, brands and quality;
- improve and develop the strategy of protecting the enterprise from various types of competitors, who are trying in all possible ways to penetrate its space on the market, take a leading position;
- regulate and create a stable internal environment of the enterprise by stabilizing the relationship between production personnel, administration, buyers and suppliers [3].

The buyer wants to purchase food products that will not only satisfy his needs and expectations, but are also rare, admirable and fully disposed to purchase, have excellent properties and stable performance. In this regard, the question arises of stimulating consumers, studying their preferences and wishes, identifying the most real levers of influence on public opinion about manufactured food products and proposals for improving them by conducting tasting events, oral and Internet surveys, etc. The golden rule says that the consumer is always right, must have a guarantee of the purchase of a harmless and safe food product, certified and acceptable for consumption.

Buyers traditionally pay attention to the organoleptic characteristics of food; an additional advantage may be the presence of special, functional properties [4-10]. But the issue of security remains significant. In this regard, the problem of developing safe food products in order to increase their competitiveness is urgent.

Of particular interest are bakery products, which for Russians are essential products, products of daily consumption.

The purpose of the research is to determine the possibility of production and sale of bakery products made using improved technologies, to ensure the safety of products and to develop a mechanism for its competitiveness.

2 Materials and methods

We used traditional and well-known research methods of nutritional and energy value, rheological, structural and mechanical properties of products, microbiological quality indicators. When recycling, developing and studying consumer preferences of new samples of bakery products, the methods of consumer assessment were applied. Methods used, such as assessment of preferences and acceptability, characteristic of commodity science. The research was based on a comparison of indicators characterizing the quality and safety of new and traditional product samples.

When determining the features and specific indicators of a particular product or finding individual competitiveness, a paired preferred test was applied and a method of ranking individual and typical characteristics was used, at which the best result is revealed for any sample. The study was also carried out using a questionnaire survey of consumers during visits to canteens. 50 respondents were interviewed.

At the same time, recipes for the bakery products with malt preparations from grain and legumes, frozen flour dietary semi-finished products (TU 9119-005-51926638-11) were proposed, new recipes for yeast products were developed (bread "Tagansky" and "Tritikalevy", buns "Moskvoretskaya", "Moskovskaya", "Taganskaya" according to TU 10.71.11-004-02068812-2019) and yeast puff pastry. Various types of malt (triticale, rye,

barley, wheat, pea and soy), obtained in the laboratory of the Moscow State University of Technology and Management (MSUTM) n/a. K.G. Razumovsky (FCU) [11-14].

Production tests were carried out at LLC "Karavai SV", a mini-bakery of LLC "Nakhabino bread" and at public catering establishments: LLC "Kurs" (four canteens), Best-Product, LLC "Trapeza 2001" (Moscow).

3 Results and discussion

In the process of developing safe food and determining the mechanism of their competitiveness, meeting the needs of the population for functional and specialized types of bread and bakery products, we investigated the existing demand and consumer preferences for the new products, taking into account the specific characteristics of the additives used and a personalized approach to nutrition. When conducting marketing research, the following were determined: 1) factors noted by consumers when purchasing; 2) preference for the selected wheat or rye bread, the volume of products purchased (weight, pieces); 3) preference for which assortment of baked goods consumers are inclined; 4) attitude towards dietary and functional bakery products.

The analysis of obtained data shows that 8 % of consumers do not buy a new range of products, but continue to search for the product they need at other enterprises. In the group from 20 to 30 years old, 100 % of respondents reported that in the absence of the necessary and favorite assortment of bread or bakery products (pies, cheesecakes, etc.) in the sale, these consumers still buy from the offered assortment, explaining the lack of time for searching, bread is the main food product for them, etc. This position is held by 27.3 % of surveyed buyers aged 30 to 40; 35.7 % in the age group from 40 to 50 years old and 33.2 % in the age group from 50 to 60 years old. It was noted that 52 % of consumers purchase assorted food products, preferring not only well-known types of products, but also novelties, functional and specialized bread and buns.

The discovery of consumers' judgments about the need to include in the assortment of retail network enterprises and canteens and bakery products with specific and functional properties has evidenced the favorable attitude of the population towards this direction of production.

For successful activity, competitiveness and a stable position in the market, it is necessary to constantly work on the assortment, to develop new original recipes. The assortment of bakery products developed by us (bread "Tagansky" and "Tritikalevy", buns "Moskvoretskaya" and "Taganskaya") was subjected of control at all stages of the technological process. Comparative data on the nutritional value of traditional white bread made from wheat flour and developed products are shown in Table 1.

A feature of the developed products is their ability to meet the needs of citizens in personalized nutrition due to the malt preparations used in the formulation from grain and legumes (triticale, rye, barley, wheat, pea and soy) [15].

Bakery products with the addition of malt preparations and fruit and berry additives are a growing trend in this group of food products around the world. In 2016, the volume of production in this category in Russia amounted to 9 million tons; the increase over the previous year was 6.4% in volume and 10% in value. In 2020 and the first quarter of 2021, the sales of bakery products are stable. There is a slight increase in demand for functional foods.

Table 1. Comparative data on the nutritional value of traditional white bread made from wheat flour and developed products

| Name of the product | Protein, % | Fat, % | Carbohydrates, % | Fiber, % | Energy value, kcal |
|----------------------|------------|--------|------------------|----------|--------------------|
| White bread | 7.9 | 5.7 | 49.2 | 2.0 | 285.00 |
| Grain bread | 11.8 | 4.9 | 45.1 | 6.5 | 253.00 |
| Bread "Tagansky" | 9.34 | 1.76 | 45.26 | 2.6 | 214.24 |
| Bread "Tritikalevy" | 4.72 | 0.63 | 36.97 | 2.5 | 152.43 |
| Bakery products | 7.9 | 9.4 | 55.5 | 2.1 | 339.00 |
| Bun "Moskvoretskaya" | 7.21 | 10.91 | 46.67 | 2.4 | 313.71 |
| Bun "Taganskaya" | 6.04 | 0.79 | 49.28 | 2.1 | 228.39 |

According to the survey of citizens when studying the demand for the new samples of products with various malt preparations, 83% of consumers consider bread made from natural food products to be very tasty and healthy. Consumers prefer bread low in fat, sugar and calories and high in fiber and protein.

The results of studies of the nutritional value of new products and their comparative analysis with the existing assortment showed that Triticale bread could be attributed to low-calorie products, which contains 1.87 times less calories than white wheat bread, and 1.66 times less than grain bread. Bread "Tagansky" in protein content exceeds white bread by 1.18 times and is inferior to it by 3.24 times in fat content.

If we compare the developed bakery products, then the Taganskaya bun is 1.5 times less high in calories than traditional bakery products. It contains 11.9 times less fat and 1.13 times less carbohydrates.

In addition, the microbiological indicators of the safety of the developed products were studied. The obtained data are presented in the table 2.

Table 2. Microbiological indicators of finished products

| Product | QMAFAnM | The quantity of the product in which it is not allowed | | | Yeast | Mold fungi |
|---------------------------|-------------------------|--|---------------------|-------------------------|------------------------|------------------------|
| | | Coliform bacteria | S. aureus | Genus bacteria Proteus, | | |
| Bakery products (control) | $1 \cdot 10^3$ CFU/g | 0.1 cm ³ | 1.0 cm ³ | 0.1 | 50 CFU/cm ³ | 50 CFU/cm ³ |
| Bread with malt | $0.04 \cdot 10^3$ CFU/g | not identified | not identified | not identified | not identified | not identified |
| Malt buns | $0.02 \cdot 10^3$ CFU/g | not identified | not identified | not identified | not identified | not identified |

The study of microbiological indicators indicated the absence of negative dynamics in the change in the contamination during storage of the samples for 4 days. The developed functional bakery products for microbiological indicators meet the requirements established in TR CU 021/2011 and TR CU 033/2013.

All of this made it possible to determine the shelf life of products, taking into account the guaranteed safety margin: the maximum storage time of bakery products with various malts is 72 hours without changing the quality indicators.

Based on the study, it can be assumed that the launch of the proposed assortment of bakery products (bread "Tagansky" and "Tritikalevy", buns "Moskvoretskaya" and "Taganskaya") into production will be accompanied by successful sales.

4 Conclusion

Thus, as a result of research work, the complete analysis of the range of bakery products produced was carried out, modern trends in the consumption of bread and rolls in canteens of LLC Kurs, mini-bakeries LLC Nakhabino bread, LLC Karavai-SV, Best-Product were considered, LLC "Trapeza 2001". The assessment of the state of commodity circulation and the prospects for its development was carried out; a justification was given for the need to develop new high-quality products.

The results of the assessment allow us to formulate the main conclusions:

1. Production of safe food does not lead to a significant increase in the cost of production.
2. In modern conditions of steady growth in the number of consumers with preferences for a healthy lifestyle, safe food products naturally displace food products from the turnover that do not meet consumer expectations.
3. Increasing the competitiveness of bread and bakery products is ensured by further research to identify factors affecting their organoleptic and other quality indicators.
4. The competitiveness of bread and bakery products from the point of view of the manufacturer directly depends on the improvement of the yeast dough production technology, which makes it possible to obtain finished products with new attractive properties of safe food.
5. Improving the interaction between employees of the enterprise, consumers and suppliers of raw materials, significantly affects the indicators of the competitiveness of safe food.

However, the developed malt preparations from cereals and legumes have characteristic organoleptic characteristics that impart unconventional taste, aroma and color to bakery products. It depends on the concentration of the added additive and the technological operation that regulates the process of dough making. Therefore, further research will be aimed at identifying factors affecting the organoleptic indicators of the quality of bread and bakery products and the attitude of consumers towards them.

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