

A METHOD OF OPTIMIZING THE PRODUCTION OF SELECTED BAKERY PRODUCTS

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Abstract

Small bakeries operate between two growing groups that include the market. Large bakeries are taking over the markets because they produce products faster, cheaper and with a longer shelf life. The product is nice, smells good and is easier to sell. On the other hand, local leaders of organic products emerge who show recipes, record the production process and present the finished product on social media. Thus, encouraging the local community to buy fresh, good-quality products at a higher than market price.

Consumers, when making choices, choose fast, cheap products, be more aware, they buy ecological products.

As a result of the above market behavior, small bakeries are unable to compete and are closed. On the one hand, a small bakery does not have the same financial base as large international bakeries and cannot, for example, implement modern, automated technological lines that limit the demand for human labor. On the other hand, small bakeries cannot afford a limited number of products, as is the case with local artisanal producers. An additional element is the lack of compliance with strict standards, as well as disproportionately lower costs in the case of craftsmen (e.g. employment of no more than 5 people, where in the case of a bakery it is at least 25 people).

Therefore, in order to maintain their competitiveness, small bakeries must operate openly by implementing new products, optimizing production or reducing costs.

Bearing the above in mind, the subject of the dissertation is an interdisciplinary approach to developing an optimal, economically justified process of producing strategic products in the examined Bakery and Confectionery Plant.

The work was divided into two parts: theoretical and research.

The theoretical part describes food, including bread, and its importance in everyday life (chapter 3). Nutritional values, market trends and the average consumption of bread in Poland per one person are presented.

Chapter 4 is technology. Bakery raw materials, methods of their preparation and appropriate additives are described. This chapter also provides information on the method of bread production and the tasks facing baking technology.

Chapter 5 presents the key data necessary to verify the economic efficiency of the activity. It presents the types of economic efficiency as well as measures, thanks to which it is possible

to verify the economic efficiency, i.e. the relation between the achieved effects and the expenditure that had to be incurred to obtain these effects [Mioduchowska-Jaroszewicz, 2008].

In the research part, the research methods were used (chapter 6.1), which, in the first place, allowed for the selection of strategic products for the Bakery and Confectionery Plant, and in the second for their analysis in terms of physicochemical and microbiological properties. The following were used for strategic methods:

- Model of the Boston BCG consulting group, to specify the appropriate portfolio of the Bakery and Confectionery's activities. The right wallet, is a portfolio of (A) products that provide financial resources for the development of other products that have a chance to increase the company's profits, (B) resignation from products that do not translate into the company's profitability.
- Operating profitability and efficiency ratios that were used as measures of operating activity (including revenues and costs).
- Technological processes thanks to which the current, traditional production processes were verified.

Secondly, the methods of physicochemical analysis (determination of acidity, pH, qualitative and quantitative profile of carbohydrates in the raw dough and in the finished product) and microbiological analysis (total number of microorganisms, yeasts and molds, lactic acid bacteria, *Enterobacteriaceae* bacteria, *Coli* bacteria, *Bacillus* sp. bacteria after heat shock, amylolytic microorganisms, *Salmonella* bacteria, *Listeria* bacteria).

In chapter 6.2, a full audit of the Bakery and Confectionery Plant was carried out, i.e. the current state of the Plant has been verified in terms of:

- Structural.
- An available product portfolio.
- Infrastructural.
- Operational. The individual revenues and costs were reviewed, which served as input to the BCG matrix (division into product groups and specification of the appropriate portfolio).
- Financial indicators. The profitability and efficiency of the Plant's operation were verified.

- Analyzes of production processes. Based on the results of the BCG matrix, the current production schemes (the so-called traditional) of selected bakery products (yeast roll, multi-grain roll, kaiser) were developed.

The result of the audit of the Plant was the development of methods for optimizing the production of selected products (chapter 7.1). Some methods have been developed:

- Management, including the implementation of the ERP system, electronic recipes and reducing the number of employees on a night shift.
- Technical and technological, including the elimination of bottlenecks in production processes and optimization of production processes.
- Infrastructure, through the use of new communication routes, improving the operation of the plant.

The developed methods were presented as innovative production processes.

These activities made it possible to carry out tests on selected bakery products according to the traditional and innovative production process (chapter 7.2 and 7.3). The tests were carried out at individual stages of production (raw dough) and after its completion (finished products). Physicochemical and microbiological tests were carried out in accordance with the adopted test methods. The conducted research made it possible to verify the quality of products manufactured with the traditional and innovative production method. The aim of the research was to verify the quality of products in the innovative production process and to achieve quality results not worse than in products manufactured according to the traditional production process.

It was an element that allowed the plant to remain competitive, retain existing customers and attract new ones.

The above effects of the innovative production process were supported by economic efficiency (chapter 7.4), which shows that the rate of return on implementations is 87%. It can therefore be concluded that the profits obtainable by Bakery and Confectionery Plant will increase over time.