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OPTIMIZATION OF THE ACCOUNTING AND ANALYTICAL SUPPORT FOR AGRICULTURAL PRODUCTS QUALITY

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Andrushko R., Myronchuk Z., Kulyna S. Optimization of the accounting and analytical support for agricultural products quality

In the market economy, product quality is extremely important to improve the economy competitiveness. The economic rivalry of economic entities, their struggle for markets is focused not only on prices, but largely on non-price factors. Among the main factors, one distinguishes advertising, creating favorable conditions for products sale, providing after-sales customer service.

It is clear that at the same price, a better-quality product will be in greater demand. At the same time, the company's significant improvement of product quality, comparing to similar products of competitors, makes it possible to increase its price without losing customers and even growing sales.

Agricultural enterprises that aim to introduce a system of continuous product quality management should develop their own system of measures to organize financing, accounting and costing of agricultural products. In its turn, it will help increasing their level of competitiveness and efficiency in general.

The applied nature of institutional regulation of the process of agricultural product quality is substantiated in the research. For successful competition of agricultural products at the foreign market, it is advisable to conduct an external quality audit.

Internal audit of product quality should be conducted to identify opportunities for improvement, to monitor performance and improve processes and labeling.

The principles and objective necessity of methodical support of accounting for the costs of agricultural products in the context of European integration have been formed.

Prospects for the further research include studying the reflection base of scientific and technical developments in terms of product quality management in the context of digitalization, and identifying basic approaches to increase competitiveness of agricultural enterprises.

Key words: *agricultural enterprises, quality of agricultural products, quality costs, accounting support, HACCP system.*

Андрушко Р., Мирончук З., Кулина С. Оптимізація обліково-аналітичного забезпечення якості сільськогосподарської продукції

В умовах ринкової економіки якість продукції відіграє надзвичайно важливу роль у підвищенні її конкурентоспроможності. Економічне суперництво суб'єктів господарювання, їхня боротьба за ринки збуту зосереджуються не тільки на ціні, а значною мірою на нецінових факторах. Серед основних чинників – реклама, створення сприятливих умов для реалізації продукції, її маркування, забезпечення післяпродажного обслуговування покупців.

Зрозуміло, що за однакової ціни більший попит матиме продукт вищої якості. Водночас істотне поліпшення підприємством якості продукції порівняно з аналогічною продукцією конкурентів дає змогу підвищувати ціну на неї, не втрачаючи при цьому своїх споживачів і навіть збільшуючи обсяг продажу. Аграрні підприємства, мета яких – впровадити систему суцільного управління якістю продукції, повинні розробити власну систему заходів з організації фінансування, обліку та калькулювання витрат

на якість сільськогосподарської продукції. Це у свою чергу сприятиме зростанню рівня їхньої конкурентоспроможності та ефективності діяльності.

Обґрунтовано прикладний характер інституціонального регулювання процесу якості сільськогосподарської продукції. Для успішної конкуренції сільськогосподарської продукції на зовнішньому ринку доцільно проводити зовнішній аудит якості. А внутрішній аудит якості продукції доцільно проводити для визначення можливостей її покращання, для моніторингу виконання та вдосконалення процесів і маркування.

Сформовано принципи та об'єктивну необхідність методичного забезпечення обліку витрат на якість сільськогосподарської продукції в умовах євроінтеграції.

Перспективами подальших досліджень є вивчення рефлексійної бази науково-технічних розробок у частині управління якістю продукції в умовах діджиталізації та визначення основних підходів щодо забезпечення підвищення конкурентоспроможності аграрних підприємств.

Ключові слова: *аграрні підприємства, якість сільськогосподарської продукції, витрати на якість, облікове забезпечення, система НАССР.*

Formulation of the problem. In the market economy, agricultural enterprises try to produce products that are of high quality and safe for customers to increase their production profitability. Agricultural products are a specific object of study, from the beginning of production to the receipt of products and to the consumer, it passes many stages, which are characterized by different quality indicators. Agricultural products can be considered of high quality if they have enough fats, proteins, minerals, vitamins, i.e. are safe. Production of quality products usually involves additional costs.

Quality costs are the internal economic basis of the entire quality system, as their evaluation, accounting and audit create the preconditions for making optimal management decisions (Andrushko, Lysa & Myronchuk, 2015). Since the cost of quality is one of the elements of the finished product cost, there is a need to organize their accounting.

At the international level, accounting for product quality costs is based on risk analysis and control at critical points of the technological process (HACCP system – Hazard Analysis and Critical Control Point, 2003).

There is nothing principally new in the HACCP requirements. The HACCP only conveniently systematizes the numerous sanitary and technological norms and rules of production, facilitates the current control. ISO 22000:2005 brings all this to the international level of standardization for export-import relations. For the enterprises operating on new modern equipment, it is easy to apply those requirements in production, but the standard is designed to take into account the opportunities of all enterprises development.

The HACCP is a management tool that provides a more structured approach to control the identified hazards than the traditional methods like inspection or quality control. The use of the HACCP system will make it possible to move from testing final products to developing preventive methods.

To date, there are unresolved issues related to optimization of the cost accounting for product quality and their control at agricultural enterprises.

Analysis of recent research and publications. The study of theoretical and applied aspects of product quality management and quality costs was considered by such economists as R.P. Andrushko (2021), A.M. Kholodenko (2013), O.B. Lysa (2015), H.Yu. Makarenkova (2016), N.A. Morozova-Herasymovych (2016), V.M. Parkhomenko, L.P. Petryshyn (2016) and others. Analysis of the scientific publications indicates that nowadays there is no clearly defined mechanism for accounting the cost of agricultural products, and the issues on the accounting rationalization are not studied. Table 1 presents the main approaches of domestic scientists to the essence of the category of «quality costs».

Product quality should guarantee satisfaction of the consumer's requests, product reliability and cost savings. These properties are formed in the course of all reproductive activity of the enterprise, at all its stages and in all links. At the same time, a product's cost amount characterizes these properties from planning of production development to its sale and after-sales service.

Table 1

Approaches of domestic scientists to interpretation of the «quality costs» category

Author	Definition
Gorbashko E.A.	the costs, associated with quality make a part of the costs of the enterprise arising from the inconsistency of quality formation processes to their most efficient flow, regulatory costs of processes, and are the object of quality system management
Morozova-Herasymovych N.A.	the concept of costs for product quality assurance should include both the cost of compliance with the specified quality parameters and the cost of quality improvement, based on the fact that without a constant and systematic action of the latter it is impossible to maintain and ensure its specified parameters
Navrozova YU.O.	product quality costs are all costs, associated with development, implementation, provision and management of a quality system, its improvement in order to achieve an optimal level of product quality in the long run
Chernukha I.M., Makarenkova H.YU.	the cost of ensuring the achieved level of quality should be understood as the whole set of periodic costs of the enterprise, aimed at production of safe products that have stable quality characteristics within the acceptable level for this group of products

Source: composed by the author.

The authors of the research consider that «quality costs» should be interpreted as the cost of systematically implemented measures and processes to ensure and improve product quality for the consumers' needs, in accordance with established technological requirements and standards.

Based on the large number of different scientific interpretations of this category, it is necessary to study the organizational principles of accounting and cost control for product quality for each of the classification groups.

Setting objectives. The purpose of our study is to determine the economic essence and classification features of the concept of «quality costs» in the system of accounting and operational control of agricultural enterprises. Rational cost accounting can become a scientific basis for development of the differentiated approaches to agricultural product quality management and increase its competitiveness in accordance with the international standards.

Research methods and materials. The scientific research was conducted applying general scientific methods (analysis and synthesis, analogy and modeling, induction and deduction, systems analysis) and special (trends and features of the research problem and research and identification of patterns).

Substantiation and disclosure of accounting and analytical essence of innovation was carried out by the methods of induction and deduction, analysis and synthesis. The system method allowed determining the main classification features and carrying out the general accounting and economic classification of quality costs. The combined use of those methods allowed disclosing the research topic and obtaining scientific results.

The information base of the study is made by the laws and regulations of Ukraine, materials of scientific and practical conferences, information from online publications and websites.

The theoretical basis of the study is shaped by the works of domestic scientists. Among the main differences, highlighted by the authors, are the insignificance and secondary nature of individual classification features and the lack of clear boundaries of the nature of quality cost. There is also no clear mechanism for accounting the cost of agricultural products, and there are many unsolved problems, related to the accounting rationalization.

Presenting main material. In conditions of shortage, when supply lags behind demand, product quality requirements are often significantly reduced. Simultaneously, saturation of the market with products forces its quality comes to the foreground. The growing demands on them are gradually becoming one of the main driving forces of production.

In the long run, there is a tendency to consistently improve product quality. It is an objective process caused by the law of growing needs. However, at certain periods of time, the mentioned trend is not able to manifest itself in relief due to the specific relationship between the volume of product supply and consumer's requirements for its quality.

Agricultural products have different purposes. According to this criterion, they are divided into three types: final consumption, intermediate and raw materials. The characteristics are given in the Tabl 2.

Agricultural raw materials (raw materials) are represented by those types of products that are used for industrial processing (a significant share of grain, flax, sunflower, etc.).

Each of those types of products has its own quality indicators. The quality indicator is considered a quantitative expression of one or more homogeneous properties of the product that meet certain consumers' needs in relation to its intended purpose and conditions of use.

The ratio of the actually achieved quality indicator to its normative (basic) value determines the level of product quality. When substantiating quality indicators and establishing their specific levels for certain types of agricultural products it is required to make comprehensive consideration of the main factors, demonstrated by the Fig. 1.

Table 2

Main types of agricultural products by the intended use

Type	Product characteristics
Raw materials	Agricultural raw materials are represented by those types of products that are used for industrial processing (sugar beet, technical varieties of potatoes, a significant share of grain, flax products, sunflower, etc.).
Intermediate products	Products intended for further use in agricultural production in the further cycles of processing (seeds, planting material, feed).
Final consumption products	These include products that are directly used due to their biological quality characteristics (fresh vegetables, fruits, berries, whole milk, etc.).

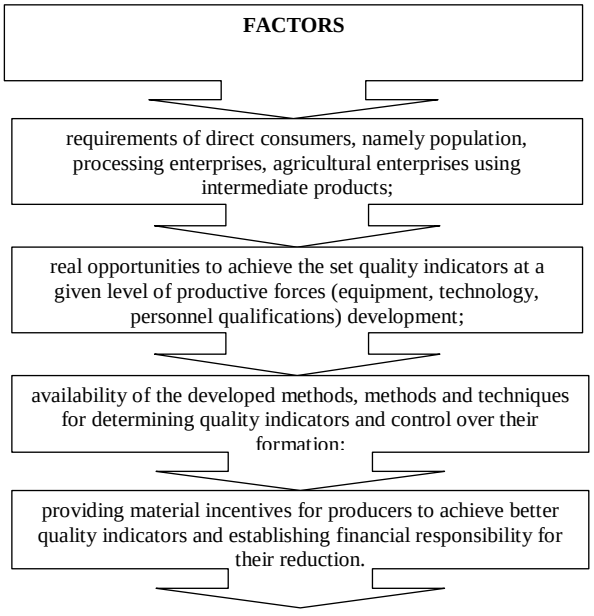

Fig. 1. **Comprehensive consideration of the main factors while substantiating the agricultural products quality.**

Product quality is a set of product properties that characterize the suitability of this product to meet certain needs of consumers in accordance with its intended purpose.

According to the world experience, product quality is a function of the level of the scientific and technological progress development and the degree of production implementation of its results. The higher the quality of products is, the more the needs of consumers are met, and the more effectively socio-economic problems of society are solved (Andrushko, 2021).

Quality indicators include (Fig. 2):

• Biological indicators characterize the suitability of agricultural products for human consumption.

• Transportability indicators characterize the degree of suitability of products for transportation and loading and unloading by the appropriate means and methods.

• Technological indicators – these indicators assess the quality of intermediate products and agricultural raw materials.

• Reliability indicators are important at all stages of the products movement for consumption - personal or industrial.

• Environmental indicators make it possible to judge the ecological purity of products and their suitability for human consumption.

• Safety indicators characterize the degree of safety for workers in the process of production and industrial use.

• Economic indicators characterize the degree of economic benefit of production for an agricultural producer of products (goods) of appropriate quality.

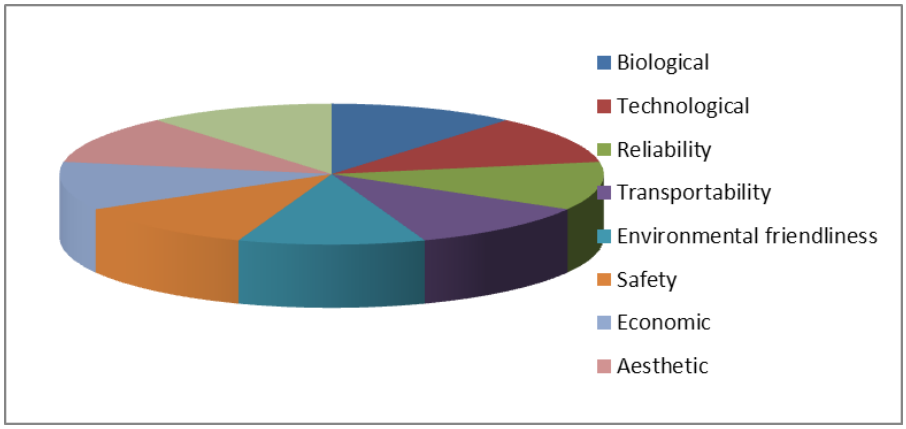

Fig. 2. **Quality indicators.**

Ukraine has approved a Law «On Basic Principles and Requirements for Food Safety and Quality», and innovations provides for introduction of the European concept of product safety and quality management, which is based on a «field-to-table» approach and requires traceability under the EU Regulation № 178/2002. This Law also sets the terms for manufacturers to make gradual transition to application of the procedures that are based on the principles of risk analysis, hazards and control at critical points of the HACCP (Andrushko, 2021).

At the international level, cost accounting for product quality is based on the risk analysis and control at critical points of the technological process (HACCP system, 2003). The HACCP is a science-based system that guarantees production of safe products by identifying and controlling hazards.

The HACCP system is the only food safety management system that has proven its effectiveness and has been adopted by international organizations. For more than 40 years of using the HACCP concept, the international community has recognized that this system works best if it is based on seven principles:

1 – analysis of dangerous factors;

2 – definition of critical control points (CCP);

3 – definition of critical limits for CCP;

4 – installation of a monitoring system for the CCP;

5 – establishment of correcting actions, if the monitoring results indicate loss of control in the CCP;

6 – establishment of verification procedures to confirm effectiveness of the HACCP system;

7 – establishment of a system of documentation and data registration. The HACCP is a management tool that provides a more structured approach to the control of identified hazards, as compared to the traditional methods like inspection or quality control.

The use of the HACCP system provides the opportunity to move from testing the final product to development of preventive methods.

The introduction of the HACCP system at industrial (food) enterprises of Ukraine started on July 1, 2003, and at agricultural ones – only in 2013 (Lysa & Andrushko, 2015). The most important benefits of its implementation are the following:

• the HACCP is a system approach that covers all aspects of food safety, from growing, harvesting, purchasing raw materials to end-user use;

• use of the HACCP will shift the emphasis from testing the final product to the use of preventive methods to ensure safety during production and sale;

• a properly conducted analysis of hazardous factors allows identifying hidden hazards and direct appropriate resources to critical points of the process;

• reduction of losses associated with product recalls, penalties and lawsuits;

• the HACCP can be integrated into the overall management system, quite organically combined with other management concepts – quality management (ISO 9000 series standards), environmental management (ISO 14000 series standards);

• use of the HACCP can be useful for confirming compliance with legal and regulatory requirements, since the HACCP is a mandatory statutory requirement in many countries of the world.

Therefore, the cost management system for the finished agricultural products quality should be implemented on a comprehensive basis.

The authors of the work consider that stages of the process of organizing the accounting of costs for the agricultural products quality and their main provisions should be enshrined in the accounting policy of agricultural enterprises.

The Order on the accounting policy of the enterprise should contain a section on the accounting of costs for product quality or a separate «Regulation on the quality cost». It is not advisable for small and medium enterprises to create a separate Regulation on the quality cost, for them it will be sufficient to introduce some elements into the Order on Accounting Policy.

For agro-industrial enterprises, which have significant sales volumes, including in the EU countries, it is reasonable to develop and approve the Standard Regulations on the cost of agricultural products. In the Regulations, it is necessary to collect all information, both accounting and general management. As a part of the costs on improving agricultural products quality, it is proposed to include the following articles (Fig. 3).

External audit of product quality should be carried out by buyers and customers of agricultural products, as well as the third-party independent accredited organizations that carry out certification for compliance with the DSTU requirements. The purpose of the internal quality audit should not be just to identify existing errors and violations in the production process, but to analyze the opportunity to improve the product quality. It is expedient for agro-industrial enterprises to conduct an internal audit to declare their products to quality standards. Internal audit quality should be based on a quantitative assessment of qualitative characteristics of the product (Petryshyn, Lysa & Andrushko, 2016).

Conclusions and prospects for further research. In the market economy, product quality is extremely important to improve its competitiveness. Economic rivalry of enterprises, individual associations, their struggle for markets is focused not only on the price but also

largely on non-price factors. Among those factors, one distinguishes advertising, creation of favorable conditions for sale of production, maintenance (if necessary) after-sales service of buyers, and the special place is occupied by production quality. It is clear that at the same price, a higher quality product will be in greater demand at the market.

Fig. 3. **List of cost to improve the quality of agricultural products (suggested by the article authors).**

*Author's own elaboration**

Competitiveness of agricultural product quality strengthens competitiveness of the enterprise as a market entity, that is, the ability to produce competitive products and ensure its sale. High-quality agricultural products provide higher profitability and financial stability of the enterprise, enhances its image, promotes the agricultural enterprise's break into the world market.

At present, there are no methodological recommendations in Ukrainian legislation on accounting for product quality costs and National Accounting Regulations (Standards), so agricultural enterprises organize accounting at their own discretion and in accordance with their needs.

In our opinion, the stages of the process of organizing the accounting of costs for the quality of agricultural products and their main provisions should be enshrined in the accounting policy of enterprises. The Order on the accounting policy of the enterprise must contain a section on the accounting of costs for product quality or a separate «Regulation on costs for quality».

Therefore, for Ukraine to enter the international markets of agricultural products, it is necessary to strengthen control over the safety and quality of all agricultural products, especially food.

Agricultural and food enterprises need to implement the HACCP system, strengthen the state control over food safety, and conduct audits of effectiveness of the state control sysems for food safety and quality of agricultural products.

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