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## Product quality as a condition for maximisation of profit: accounting and control aspects

### Abstract

The article considers approaches to the interpretation of the essence of the concept of quality according to both scientific and international quality standards ISO 9000. The authors have presented an analytical assessment of the commodity structure of import and export of agricultural and food products in Ukraine and its impact on the improvement of product quality. It has been emphasised on the need to attract investments and to strengthen the capacity of the State related to the manufacture products with the involvement of the newest technologies in compliance with all the required standards of product quality. The author of the article has considered the system and components of quality management as a tool for meeting stakeholders' needs and implementing management to reduce risks and timely respond to them in terms of a crisis. The factors influencing the improvement of product quality, as well as financial results of the company, have been determined.

A survey of 61 agricultural enterprises of Vinnytsia region of Ukraine was conducted by the authors in 2016 to identify the level of awareness and control of product quality management system and efficiency of accounting and control functions at agricultural enterprises.

The survey questionair consists of nine questions, namely: Do the farm management carry out product quality management? Is the agricultural enterprise an ISO certificate holder and does it meet its requirements? Does the agricultural enterprise make financial investments in the improvement of product quality? Does the company monitor the agricultural product quality of rival companies? Which staff member is responsible for quality conformance control of the agricultural production? Who is responsible for the product quality in the company? How does the company assess the quality of agricultural products? What share (%) of the agricultural products sales is spent on the improvement of product quality? Is it expected that quality improvement should affect the financial performance of agricultural enterprises?

Following the answers, a positive trend can be seen, since more than a half of the enterprises manage and invest in the improvement of product quality. The findings allow concluding that the product quality management at agricultural enterprises is of a relative character, as it is done by introducing more productive crop varieties and animal breeds, as well as advanced production technologies, etc. into production. It has a character rather of one-time actions than a strategy.

The efficacy of control functions as multidimensional phenomena of management functions and functions of accounting has been investigated. The article deals with the approaches to accounting and control to ensure product quality and its impact on profitability. The authors of the article have substantiated a need for the Product Control Council for business entities in order to improve product quality, which affects the maximisation of profits.

**Keywords:** Product Quality; Profits; Management of Product Quality; Accounting; Control

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### Якість продукції як умова максимізації прибутку: обліковий і контрольний аспекти

#### Анотація

У статті розглянуто підходи до тлумачення сутності поняття «якість» з точки зору науковців з урахуванням міжнародних стандартів якості ISO 9000. Здійснено аналітичну оцінку товарної структури імпорту та експорту сільськогосподарської та продовольчої продукції України та її впливу на підвищення якості продукції. З'ясовано необхідність залучення інвестицій та розширення можливостей держави здійснювати виробництво продукції за новітніми технологіями з дотриманням усіх необхідних стандартів якості продукції. Розглянуто систему та складові менеджменту якості, що є засобом для задоволення потреб зацікавлених сторін та здійснення управління для зменшення ризиків та вчасного реагування на них в умовах кризових явищ. Визначено чинники впливу на підвищення якості продукції та покращення фінансового результату діяльності підприємства.

Досліджено дієвість функцій контролю як багатоаспектного явища функції менеджменту та функції обліку. Розглянуто підходи до обліково-контрольного забезпечення якості продукції та її впливу на прибутковість підприємств. З метою підвищення якості продукції, що впливає на максимізацію прибутку господарюючих суб'єктів, обґрунтовано потребу в створенні Ради з питань якості продукції.

**Ключові слова:** якість продукції; прибуток; менеджмент якості продукції; облік; контроль.

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**Качество продукции как условие максимизации прибыли: учетный и контрольный аспекты****Аннотация**

В статье рассмотрены подходы к толкованию сущности понятия «качество» с точки зрения ученых с учетом международных стандартов качества ISO 9000. Дана аналитическая оценка товарной структуры импорта и экспорта сельскохозяйственной и продовольственной продукции Украины, а также влияния данной структуры на повышение качества продукции. Определена необходимость привлечения инвестиций, что будет способствовать расширению возможностей государства осуществлять производство продукции по новейшим технологиям с соблюдением всех необходимых стандартов качества продукции. Рассмотрена система и составляющие менеджмента качества, что представляет собой средство для удовлетворения потребностей заинтересованных сторон и осуществления управления, целью которого является уменьшение рисков, а также своевременное реагирование на них в условиях кризисных явлений. Определены факторы влияния на повышение качества продукции и улучшение финансового результата деятельности предприятия. Изучена действенность функций контроля как многоаспектного явления функции менеджмента и функции учета. Рассмотрены подходы к учетно-контрольному обеспечению качества продукции и его влиянию на прибыльность предприятий. Обоснована необходимость в создании Совета по вопросам качества продукции с целью повышения качества продукции для максимизации прибыли хозяйствующих субъектов.

**Ключевые слова:** качество продукции; прибыль; менеджмент качества продукции; учет; контроль.

**1. Introduction**

In order to develop international cooperation, Ukraine needs to adapt the system of national standards of food products safety and quality to the requirements of the EU and the Customs Union.

In terms of European integration, Ukrainian enterprises have faced a number of requirements regarding the quality standards related to their products. Under such conditions, competitiveness of enterprises is determined by the quality of products, on which the demand and pricing depend, as well as by its impact on the process which ensures the possibility for the enterprise to maximise profits. Under the conditions of a market economy, profit is seen as a driving force. In this respect, the system of management should provide a reliable accounting and control system to ensure preservation of the capital to maximise profits and enhance operational indicators of economic entities. The main criterion of perfect accounting and control is their operational informativeness for management purposes.

**2. Brief Literature Review**

Works by different economists are dedicated to various issues of accounting, control and analysis of quality.

The essence of product quality was studied in the work by A. Feigenbaum (1991) [10]. The works by foreign scientists, such as W. E. Deming (1993), M. Juran (1967) [9], A. Feigenbaum (1991) [10], Ph. Crosby (1967) [11], Steedman, Scott (2015) [3], S. Medic, B. Karlovic, Z. Cindric (2016) [4], A. Satanova, J. Zavadsky (2015) [21] are dedicated to the issues of quality management.

A significant contribution to the scientific and practical research of accounting and control related to product quality and its impact on the profitability of enterprises has been made by P. A. Anisimov (2000) [6], L. V. Gutsalenko (2010) [7], G. G. Kireytshev (2008) [17], V. M. Parkhomenko (2011) [20], I. Tumrienko (2010) [1], O. Starenka (2015) [14], Jinbu Zhai, Yutao Wang (2016) [18], P. P. Novychenko (1986) [19] and others. Given the importance of the research and not reducing their importance of the development of science, there is a need to improve the organisation and methods of accounting and quality control of products to maximise business profitability.

**3. The purpose** of the research is to define the essence of the concept of quality and quality management system, to determine the factors influencing the improvement of product quality and the enhancement of financial results of the enterprise, to study approaches to forming of products based on the quality of accounting and the order in which they are displayed in the system of accounts, as well as to ensure the effectiveness of control as integrated management functions.

**4. Results**

Under the conditions a market economy and sustainable economic development, the requirements to producers in

terms of product quality are especially relevant. Agricultural products are no exception. Nowadays, developed countries accept high quality products as one of the main sources of their national wealth. Food quality in many respects defines the prestige of a state, and is the basis for the conservation of the gene pool being the most important component of competitiveness [1, 1].

According to the ISO quality standards, quality is a combination of characteristics of an object (the process which is described and considered individually, for instance, production, organisation system or any combination of them) that correspond to an ability to satisfy the identified and estimated needs [2].

The new format for ISO 9001:2015 and ISO 14001:2015 requires direct attention of senior executives to the importance of business management [3].

Hence, ISO 9001:2015 is intended to encourage integration and harmonisation with business processes and business strategies. The top management now has to take more responsibility for the effectiveness of the quality management system. In the latest version of ISO 9001:2008, such a responsibility was imposed on the quality manager due to the fact that ISO 9001:2015 pays more attention to risk management by the parties concerned in the context of the organisation, while the quality management system also focuses more on the needs of the top management [4].

Recently, quality has been defined as one of the factors which determine business success. It is the product quality that affects the price. In our opinion, management, accounting and control play a significant role in the production of quality products.

A competitive market environment imposes the level and pace of product quality development. Figure 1 and Figures 2 present a commodity structure of import and export of agricultural and food products in Ukraine.

An analytical assessment of statistical data on import and export of Ukrainian farm food products allows stating the fact that Ukraine increased its imports of final food products by 2.6% and products of plant origin by 5.8% between 2010 and 2015 (Figure 1). The share of fats and oils of animal and vegetable origin and live animals and animal products has decreased.

An analysis of the structure of the export of agricultural and food products over the period of 2010-2015 shows that Ukraine has only increased its market share for products of plant origin by 14.7%. For the other types of agricultural and food products a decrease in sales is seen (Figure 2).

Figure 3 and Figure 4 show a comparative assessment of the export-import operations in Ukraine in 2015. The import of vegetables accounts for 32.9%, whereas the export reaches 54.7%, which means that high quality plant products were

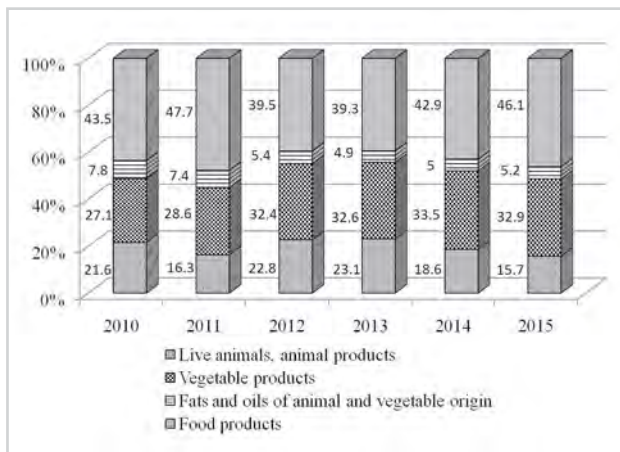


Fig. 1: Commodity structure of imports of agricultural and food products

Source: Compiled by the authors based on [5]

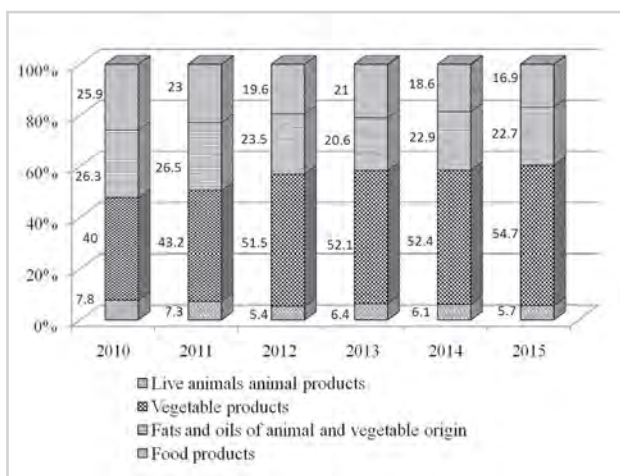


Fig. 2: Commodity structure of export agricultural and food products

Source: Compiled by the authors based on [5]

purchased from Ukraine as raw materials for the production of the end products, which in subsequent periods returned to Ukraine in the form of end food products (46.1% in 2015). Ukraine exported only 16.9% of end products in 2015.

The conducted analysis indicates a need to attract investment and empower the state to implement product manufacturing by using the latest technologies in compliance with all the required standards of product quality.

Product quality management should be made systematic, so that a company has a functional quality management system, which presents an organisational structure. Its main guidelines include control over marketing activities as part of the general management system, its customer orientation and strengthening the influence of the control mechanism of the quality management system at all stages of the product life cycle. Improvement of product quality requires certain costs, which usually pay back. According to US experts, the cost of quality for many companies reaches 20% of sales, rising annually [6].

According to different researches conducted by foreign and domestic scientists, the management system, which enhances the satisfaction of consumer needs, results in higher profits and lower costs. The purpose of this system (in other words, TQM -Total Quality Management) is the search for excellence in business and competitive leadership and meeting the needs of consumers. The preconditions and principles of the system, in our opinion, are primarily every employee's participation and responsibility at the enterprise, creation of favourable conditions to achieve the intended objective, fulfillment of the employees' duties, etc. [7, 79].

As it is known, the leaders who studied general management qualities were W. Deming (1993), J. M. Juran (1967), A. Feigenbaum (1991), Ph. Crosby (1967).

Thus, according to W. Deming, 94% of problems are caused by management, whereas only 6% - by employees. According to his theory, quality results depend on productivity, cost reduction, increase in a market share and long-term stability. One of the components of the system suggested by W. Deming is control [8].

According to the philosophy of J. M. Juran (1967), management takes full responsibility for quality planning, control quality and product quality improvement. He outlines the following components of quality management:

- establishment of policies and principles of product quality;
- definition of the goals of quality;
- availability of the plan to achieve these goals;
- allocation of responsibilities under the plan;
- creation of appropriate resources;
- assessment of effectiveness of management as regards the goals [9].

A. Feigenbaum believes that control includes four steps:

- 1) definition of quality standards;
- 2) assessment of conformity to standards;
- 3) activities according to the standards;
- 4) planning standards improvement.

A. Feigenbaum emphasises features, such as:

- quality is a process which involves the whole enterprise;
- quality must be understood the way it is understood by a consumer;
- quality and value which is the amount, not the difference;
- quality requires work of each individual and a whole team;
- quality is a way of management;
- quality and innovation are interconnected;
- quality is a moral category [10].

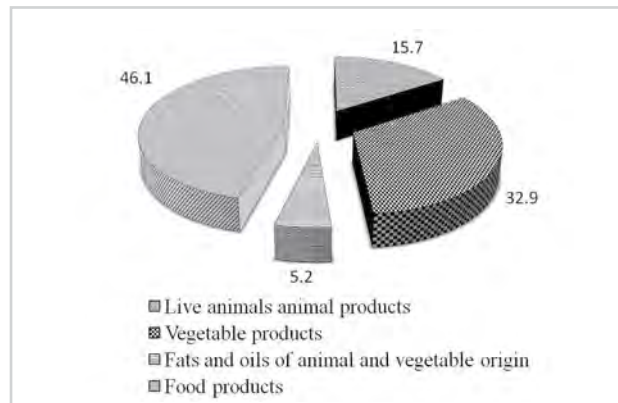


Fig. 3: Pie chart of imports of agricultural and food products in 2015

Source: Compiled by the authors based on [5]

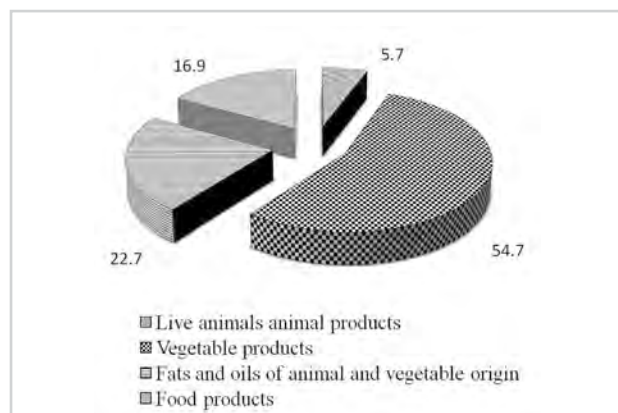


Fig. 4: Pie chart of exports of agricultural and food products in 2015

Source: Compiled by the authors based on [5]



Quality requires constant improvement. This is the most effective and the least capitalised way to productivity. Quality is part of the whole system of relations between consumers and suppliers.

In the theory by Ph. Crosby (1967), we find such an understanding of quality:

- quality means conformity;
- not the good or elegance;
- there is no such a notion as «quality problem»;
- it is always cheaper to do the work correctly the first time;
- the cost of quality is the only measure of work;
- absence of defects is a single standard of work [11].

A critical evaluation of the views expressed by the scientists above, leads to the conclusion that all the authors, except Ph. Crosby (1967), rely on statistics. W. Deming, J. M. Juran (1967) and K. Ishikawa (1981; 1985) blame management for the lack of quality and only Ph. Crosby (1967) accuses employees.

To confirm these theories, we have conducted research dealing with internal and external factors affecting the improvement of product quality management. According to statistics [5], in late 2015 there were 51,911 farms in Ukraine, including 2,685 farms in Vinnytsia region. The research covered 61 enterprises.

The survey of 61 agricultural enterprises of Vinnytsia region of Ukraine was conducted by the authors in 2016. The purpose of the research was to identify the level of awareness and control of product quality management system and efficiency of accounting and control functions at agricultural enterprises of different legal forms.

The questionnaire included the following questions:

- Question 1: Do the farm management carry out product quality management (TQM)?
- Question 2: Is the agricultural enterprise an ISO certificate holder? Does it meet its requirements?
- Question 3: Does the agricultural enterprise make financial investments in the improvement of product quality?
- Question 4: Do the company monitor the agricultural product quality of rival companies?
- Question 5: Which staff member is responsible for quality conformance control of the agricultural production?
- Question 6: Who is responsible for the product quality in the company?
- Question 7: How does the company assess the quality of agricultural products?
- Question 8: What share (%) of the agricultural products sales is spent on the product quality improvement?
- Question 9: Is it expected that quality improvement should affect the financial performance of agricultural enterprises?

To summarise the findings of our research, we should pay attention to Figure 5 which shows the answers to questions 1-4 of the questionnaire. Following the answers, a positive trend can be seen, since more than a half of the enterprises manage and invest in the improvement of product quality.

Question 5 relates to the company's personnel who deal with the monitoring of quality parameters of agricultural production. Table 1 shows the results for the investigated enterprises with a formal character of control levels of quality parameters of agricultural production.

The findings presented in the Table 1 show that quality control in the investigated farms makes up 11.8% on average. The formal character is implemented through control functions of the companies' management that have a relative effect on the improvement of product quality, but do not affect the performance of the company. It should be noted that the activities of control bodies cannot be called

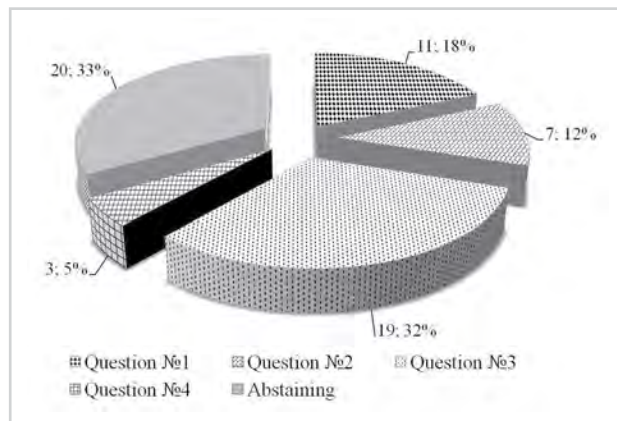


Fig. 5: The results of the survey, questions 1-4  
Source: Compiled by the authors in 2016

effective since a significant part of them operate formally, that is they do not fully perform their functions, which hinders the quick flow of objective information about the company and makes it impossible to predict the impact of various factors on the financial results.

Questions (6-9) focus on specifying the efficiency of product quality management. To generalise the information, we have grouped the data for large, medium-sized and small enterprises and the answers on the basis of the company's involvement (the companies which invest, have formal approach, show interest or are considered abstained) (Table 2).

The evaluation of the findings (Table 2) suggests that, on average, 18% of the surveyed companies make investments, 42% have formal approach to the improvement of product quality, 22% showed interest and 18% of the enterprises abstained. The findings allow us to draw a conclusion that the product quality management at agricultural enterprises is of a relative character, as it is done by introducing more productive crop varieties and animal breeds, as well as advanced production technologies, etc. into production. Quality management has to be performed not through one-time investment but systematically and requires sustainable financial state and certain financial resources that only large farms and corporations can afford.

Medium-sized enterprises and farms, which are small businesses, have to find another way. Over the last few years,

Tab. 1: The findings of the research of formal character of control levels in the investigated areas, %

Area	Control by the owner	Control by the supervisory board	Control by the company audit commission	Internal audit	Managerial control	Control Quality Management (TQM)	Control by permanent inventory commissions	Technology control	Control by planning and economic department	Accounting control	Social control	Employees' self-control
1	2	3	4	5	6	7	8	9	10	11	12	13
Chechelnyk	-	-	-	-	-	-	45.4	100	-	-	18.1	-
Koziatyn	-	-	-	-	-	15	-	-	-	-	-	63.6
Murovani Kurylivtsi	-	-	-	-	10	10	-	10	-	-	30	40
Mohyliv-Podil'skyi	-	-	-	-	40	40	-	-	-	-	-	-
Bershad	-	-	10	-	-	20	-	-	-	-	30	10
Pohrebyshe	-	-	-	-	-	-	33.3	-	-	33.3	33.3	16.6
Lityn	-	-	-	-	-	-	-	-	-	-	-	-
Illintsi	-	-	-	-	10	10	-	-	10	-	40	10
The average value of the investigated areas (%) by region	-	-	1.1	-	7.5	11.8	4.7	13.7	1.2	4.1	18.9	17.5

Source: The survey of 61 agricultural enterprises of Vinnytsia region of Ukraine conducted by the authors in 2016

Ukraine has gained outstanding popularity for its eco-products, thus farmers should focus their activities on the production of vegetables, fruits, dairy and meat products, which are grown without the use of chemicals.

The estimated world market share of eco-production is 4,200 billion Euros, with the EU share of 21%. This market has been growing, on average, by 4% annually even during the recession and has the greatest job creating potential [12].

The Law of Ukraine «On Processing and Turnover of Organic Agricultural Products and Raw Materials» No. 425-VII as of 03 September 2013 states that the government policy in this area aims at the development of competitive, highly efficient agriculture by using organic production (raw materials) and the domestic market for organic products, as well as meeting consumer demand for a range of organic products. Ecological products cannot be manufactured by large companies. The state should act as a guarantor, and enable production by supporting small and medium-sized businesses [13].

Experts from the UN, OSCE, EU / FAO suggest that Ukraine can become a world leader in the production of products with advanced environmental characteristics, which, undoubtedly, will have an impact on the improvement of financial performance of business entities and the economy of the agricultural sector of Ukraine.

The assessment of the mentioned approaches to the impact of quality on financial results leads to the conclusion that the improvement of product quality will improve financial results. The factors influencing the improvement of product quality are shown in Table 3.

The development of accounting in Ukraine is influenced by the works carried out by scientists from other countries that consider theoretical and practical aspects of accounting and control, and have a positive impact on their organisation in our country [14].

An important tool for the correct and reliable accounting and control at enterprises is the legal framework, constant change and improvement, which requires adaptation and corrections of accounting, analytical and control software accordingly [15]. The control functions of management of business entities should be formed by taking into account internal and external factors. The

role of adaptation of the enterprise to achieve a positive financial result from its operations to external and internal factors and management control functions are presented in Figure 6.

The main function of accounting at the enterprise is informational function. Due to this accounting feature, the enterprise has an urgent need to form its own information and accounting structure or, in other words, system. The information and accounting system of the company (IASC) makes up a leading segment of the information system which provides the enterprise and statutory customers with accounting and reporting information about its optimal volume, good quality and certain time periods [16, 206].

G. G. Kireytsev (2008) identifies several control functions, namely: monitoring should be seen as a multidimensional phenomenon, as a function of both management and accounting, including the function of coordination for entities. Control is a three-pronged function. Considering that the economy is the core of every civilization, the control is always associated with it, as well as with the processes of economic reproduction and should be seen as an integrated function of management. The implementation of control functions is a multidimensional process that takes place at all stages of the movement of capital and covers all

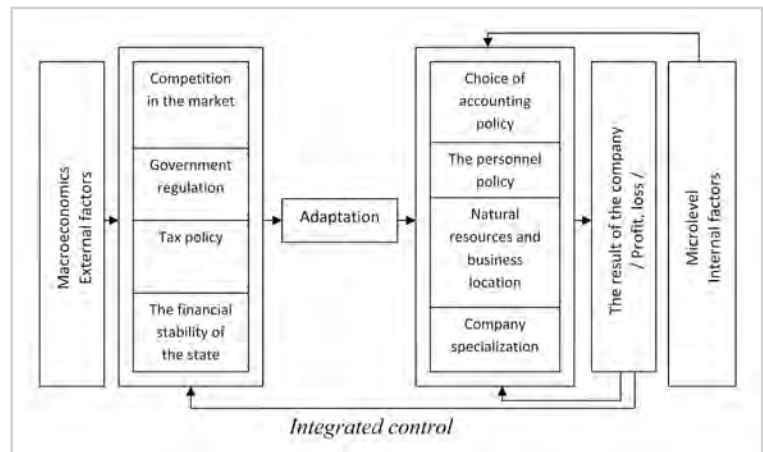


Fig. 6: Factors that affect financial results of a company in its adaptation to market conditions  
Source: Compiled by the authors based on [7]

Tab. 2: Survey findings related to expenses on product quality improvement

Agricultural Enterprises	Number of Enterprises	Survey findings, %			
		Make Investments	Formal Approach	Showed Interest	Abstained
Large	4	30	40	20	10
Medium	27	15	40	20	25
Small	30	40	45	25	20
Average value	61	18	42	22	18

Source: The survey of 61 agricultural enterprises of Vinnytsia region of Ukraine conducted by the authors in 2016

Tab. 3: Factors influencing improvement of product quality

Factors influencing the improvement of product quality	Characteristics of factors influencing the improvement of product quality
Education	A need to continue the improvement of the educational level of professionals
Responsibility	Improvement of the quality of products concerns each employee
Measuring the value of quality	Provides the necessary methods of measurement, documentation and analytical research into the cost of quality
Teaching	Provides a thorough study of methods and tools for improving product quality
Defining goals	Provides identification of priority sectors and the final goal
Research and creative action	Creates a system of procedures, forms and documentation
Audit of quality	Provides feedback from the management system and accounting
Awareness	Provides an ongoing discussion on the importance and benefits of management and accounting impact on product quality, the use of communication and compatibility with enterprise activities
Recognition	Plays a catalytic role and assumes a need for disclosure of the achievements of individual workers and groups that provide expediency of financial rewards

Source: Developed by the authors

economic aspects of social production. Both the manager and the bookkeeper try to implement the control function, however, the manager sees it as a function of management, which has a much wider sphere of influence and the bookkeeper as both cognitive and communicative functions of accounting to agree the facts of economic life with its legislative norms. The functions considered are up-to-date and in constant demand. They contribute to each other and constitute jointly divided administrative work. During the subsequent processing of accounting information, it creates economic model of business structure - balance and other models as financial statements [17, 4-5].

The high quality information makes external stakeholders fully aware of the problem and allows them to take measures to control the processes of the enterprise [18].

Some authors say that, in industries where products are manufactured with different quality characteristics, it is necessary to calculate the cost of production with regard to quality, taking into account the additional costs for raising product quality and improving product quality characteristics [19, 75-76].

V. M. Parkhomenko believes that quality costs are a total of costs inferred by the requirement to achieve or maintain a certain level of product quality in the company, that is due to evaluation measures, support and improvement of the quality of products. This definition allows to distinguish between costs of quality and other expenses and to build a system of analytical accounts of quality costs [20,13].

To ensure accounting of business operations and records of the costs that affect the quality of agricultural products, it is

appropriate to account 23 «Production» to a sub-account 239 «Costs for improving product quality».

In the debit of the account costs associated with improving the quality of agricultural products of own production will be accrued, which will ensure the safety of the population. The credit account corresponds to the debit account 902 «Cost of sales» in the process of implementation; the write-off of costs incurred for the costs of the enterprise. Product quality has a direct impact on retail sales prices, which, in turn, affects the financial results of the entity.

V. M. Parkhomenko also suggests that first of all the information related to the cost of quality goes to the accounts of costs by type, and then it is displayed in the accounts according to the stages of the life cycle, and afterwards - in the accounts of costs by type of products. According to the author, it is advisable to allocate a separate article entitled «The cost of quality» in standard costing, which will contribute to the efficient implementation of analytical calculations and the implementation of forecasting the performance of the company [20, 17].

The factors affecting product quality of business entities including agricultural are generalized in Figure 7.

Given the micro- and macroenvironment, in which agricultural enterprise operates, its financial performance is influenced directly by product quality. The latter is improved through close interaction of accounting, control and management.

## 5. Conclusions

To ensure the effectiveness of the impact of product quality on the financial results of product quality, it is necessary for an enterprise to create the Product Quality Council that will coordinate all corporate interests in product quality. The members of the Product Quality Council should be representatives of all departments of the company. The Council should develop strategic plans, monitor product quality of rival companies, bear responsibility for the quality of products and seek ways to improve it. The Council has to make their decisions based on the latest accounting information, which credibility is ensured by the control function.

The control function of the efficiency of such a body in enterprises is advisable to be carried out by financial and economic services, responsible for forecasting the costs of all products produced by an enterprise using the methods of costs provided by the accounting policy of economic entities.

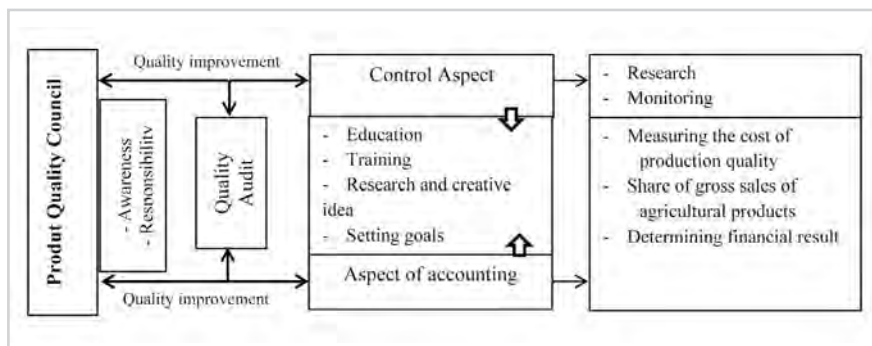


Fig. 7: Quality management model of business entities

Source: Compiled by the authors

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