SCIENTIFIC HORIZONS

Journal homepage: https://sciencehorizon.com.ua
Scientific Horizons, 26(6), 121-133

UDC 338.22.021.4
DOI: 10.48077/scihor6.2023.121

Development of a competitive strategy of an organic production enterprise based on discriminant analysis

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Article's History:
Received: 2.04.2023
Revised: 30.05.2023
Accepted: 15.06.2023

Abstract. This study offers an additional toolkit that will allow substantiating the formation of a strategy for future development considering the potential growth or reduction of activity, which is relevant for producers of organic products, since considering the potential trajectory of development will provide an opportunity to protect the enterprise from unfounded decisions in the event of a reduction in activity and will help activate existing reserves in case of future growth, which is relevant and quite in demand. The purpose of this study was to prove or refute

Suggested Citation:
Kotsenko, M., Tkachuk, V., Kilnitska, O., Lysytsia, N., & Shaposhnikova, I. (2023). Development of a competitive strategy of an organic production enterprise based on discriminant analysis. *Scientific Horizons*, 26(6), 121-133. doi: 10.48077/scihor6.2023.121

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the hypothesis about the influence of several factors on the development of organic products, as well as to determine the further strategy of the enterprise. For this, data from 75 Ukrainian enterprises that grew organic products were analysed. The division of enterprises into groups depending on the volume and growth rate and identification of factors affecting the future development of organic producers was carried out using cluster and discriminant analysis. The factors that substantially affect the future development and allowed dividing the enterprises under study into groups were the diversification of production, the replacement of crops, changes in the volume of organic production, and changes in production efficiency. Whereas the factors "percentage of new (or withdrawn from production or not certified) crops in the new year to the total volume of production last year" and "change in the area of organic soil" did not show sufficient influence on the distributive capacity of the model, and were excluded from further analysis. It is proposed to develop a strategy for enterprises producing organic products based on a differentiated approach for three different groups of enterprises, namely: those that potentially have high potential, speed of development and expansion of activities; those that are potentially expected to reduce and decrease the production of organic products; those that develop at moderate rates. The obtained equations can be used in practical activities for additional justification of the development strategy of organic producers

Keywords: competitive advantages; sustainable development; competitiveness; success factors; organic products

INTRODUCTION

The world market of organic products has grown substantially over the past decades and continues to grow, and therefore the formation of strategies for entering such markets and functioning on them is becoming increasingly relevant for Ukrainian enterprises. As a result, the identification of competitiveness factors and the development of winning strategies for agricultural producers become a promising area of scientific research. The trends that cause the need to research the competitiveness of enterprises of all sectors of the economy in modern realities are as follows: digital transformation of relations between the consumer and the producer (Kryshtal *et al*., 2022), between the producer and the supplier and the restructuring of business processes of enterprises and supply chains as a result. One of the relevant studies is the work of Garcia *et al.* (2023), who examines the sustainability of the agri-food supply chain from small producer to consumer and proposes its improvement, through a modelling approach for the farmer and a digital counterpart.

The orientation of the world economy towards the processes of resource conservation, green economy, circular economy is highlighted by Yaremova *et al.* (2021), where approaches to the possible development of society in the production of goods based on renewable biological resources are considered. The paper proves that with the development of the circular economy, the society will be able to overcome the modern challenges and will help produce consumer products not only by neutralizing the harmful effects of management and minimizing industrial waste, but also ensure the restoration of bioresources. Ostapchuk *et al.* (2020) suggests that Ukrainian agricultural producers combine the concept of lean production and "green logistics", which can rationally use the available resources of the enterprise and environmental protection during both the production and sale of food products.

The transition of agricultural enterprises to the principles of sustainable development is a reason for scientific discussions. Thus, Shkuratov *et al.* (2021) proposed a methodology for assessing the ecological efficiency of the spatial organization of rural areas. This method will help use rural areas to increase the efficiency of agricultural production and minimize adverse consequences for the ecosystem.

A current trend is the investigation of the social responsibility of producers (Skydan *et al*., 2023) and the formation and development of production, social, and market infrastructure (Kravchuk *et al*., 2021). However, as noted by Yatsiv & Yatsiv (2018), a considerable part of agricultural enterprises in Ukraine do not consider their own resource capabilities and their place in the competitive environment. This is conditioned upon the lack of consistency in the development of corporate strategies.

Peng (2019) and Sahota (2020) investigated the development of organic production and consumption markets at the level of the global economy, individual countries, or regions. A study by Hou *et al.* (2022) proved that the market for organic products in the USA is developing rapidly, and demand considerably exceeds supply, which indicates the need to find ways to develop organic agriculture. According to scientists, supporting scientific research in the field of organic production, increasing the number of workers in the industry and a strong consumer base are crucial for the development of the organic production sector in the United States and around the world.

Analysis of factors that can influence the purchase of organic products showed that the key in this case is the concern of the population for their health and future generations. Mishra (2022) recommends raising public awareness about the impact of organic food on human health and on the planet, which will be an incentive to buy more healthy foods. The study (Wang *et al*.,

2017) emphasized that the greater the investment in organic production, the greater the competitiveness of the producer. While the authors (Marasteanu & Jaenicke, 2018), on the contrary, considered the impact of the development of organic farming on the economy and the qualitative transformation of the economy based on the principles of sustainable development through the development of organic farming and organic production.

The state of development of the organic market in Ukraine is analysed in the study (Bogomolova, 2021), which states that organic agriculture is one of the most promising areas of the country's agricultural economy. The transition to organic production will increase the level of environmental awareness of the population and improve the balance between environmental and economic factors of society. The institutional environment of the production of organic products was investigated by Kotsenko (2022) and the current state of institutions supporting the activities of producers of organic products in Ukraine was analysed, and it was noted that the further development of organic agriculture requires the development of regulatory documents, national support using the practices of the countries of the European Union.

Despite a significant amount of research on the issue of environmentalization of agriculture, the development of organic production and its competitiveness, it is necessary to investigate the issue of forming a competitive strategy for the production of organic products and their competitive advantages, which determined the purpose of this paper.

MATERIALS AND METHODS

To solve the tasks set, general scientific and special methods of cognition were used during the study. The synthesis and comparison method was used to develop recommendations on enterprise development strategies, the generalization method was used to form conclusions and recommendations, while tabular and graphical methods were used to visualize the results obtained. The study of the results of efforts of agricultural producers to achieve certain competitive advantages allows assessing the prospects of existing vectors of development of the Ukrainian agricultural sector. To determine the impact of several factors on the competitiveness of organic production enterprises, it is proposed to use cluster analysis. The data of 75 agricultural enterprises of Ukraine, which entered the European markets of organic products, according to the data of the Ukrainian certification body "Organic Standard" (n.d.), were studied. All the above-mentioned enterprises are certified for organic production, which means that the objects of observation have authorized technical documentation that meets the established norms and standards for products, production environment, materials and resources, environmental management, quality management system, waste disposal, etc. Factors used to evaluate the company's performance:

Diversification of production (X_1) is a criterion that is successfully used to determine the competitiveness of enterprises in many sectors of the economy (Belenkova, 2020; Raj, 2022). This factor is quite informative, regulated by the company's managers, and it is also effortless to assess. The study evaluates the diversification of production by the number of organic crops that are grown. Among the enterprises under study, the number of crops varies from one to thirteen.

Expansion (reduction) of certain types of production (X_2) is the percentage of new (or withdrawn from production or not certified) crops in the new year to the total volume of production last year. This factor shows the dynamism of production, the ability to adapt the enterprise to changes in market conditions. It differs from the previous one in that it estimates the proportion of organic crops that have been replaced by others, introduced a new one, or reduced one, estimating the depth of transformations. For the enterprises under study, the factor varies from -1.37 to 10.16.

The turnover of crops (X_3) is an indicator according to which the replacement of crops with new ones was evaluated (in the analysis, it is marked as "1"), stability and absence of replacements (marked as "0"), the reduction of the production nomenclature – (marked as "-1"), the increase in the number of new cultures (mark "2").

Change in the volume of organic products (X_4) is an indicator that characterizes the increase or decrease in the volume of production of organic products in relation to the volume of the previous year.

Change in the area of organic soil (X_5) (Aceleanu, 2016) is an indicator that characterizes the increase or decrease in the area of land that meets the requirements for organic farming and is certified to the area used by the enterprise last year.

Changes in production efficiency (X_6) (Zeru, 2018) is an indicator that is calculated as an increase or decrease in the yield per 1 ha of certified land compared to the previous year. Since the producers of various crops, which carry out economic activities in different regions of the country, are evaluated, it does not make sense to evaluate the yield of each crop or the average for each producer. However, the proposed relative indicator characterizes how much more or less efficiently the enterprise conducts business activities in comparison with its results in the previous period. This relative assessment can be applied upon determining competitiveness. If additional data are available on the performance of producers of homogeneous products, this indicator can be updated or replaced with yield.

Cluster and discriminant analysis was performed using the TIBCO Statistica statistical analysis software package (Statistica 10). Since different measurements use completely different types of scales (thousand square meters, percentages, units, fractions of a unit,

etc.), the data needs to be standardized (normalized). Standardization is performed according to Eq. (1) for the mean square deviation σ (Marets & Vilchynska, 2016):

$$z_i = \frac{x_{ij} - \bar{x}}{\sigma_{xj}}, \quad (1)$$

where z_i is the normalized value; x_{ij} is the initial value of the indicator; x is the average value of the indicator; σ is the mean square deviation. Ward's method was used for tree clustering.

RESULTS AND DISCUSSION

There were several stages in this research. At the first stage, tree clustering was performed to find out whether enterprises form groups and select the previous number of clusters, for which we use the Ward's method. This method is based on the results of variance analysis to estimate distances between clusters. Based on the minimum sum of squares (SS), groups of enterprises are formed at each stage of the clustering process. As a measure of the distance between enterprises, the Euclidian distance was chosen, which is the geometric distance between objects in a multidimensional space (Belenkova, 2019):

$$L = \sqrt{\sum_i^n (x_i - y_i)^2}. \quad (2)$$

The results of this stage indicate that there are at least two groups of enterprises that differ in size, business strategy, and efficiency. The next result obtained from a hierarchical clustering is a vertical dendrogram (Fig. 1), the analysis of which helps visually identify the division of enterprises into three groups (highlighted by a red line).

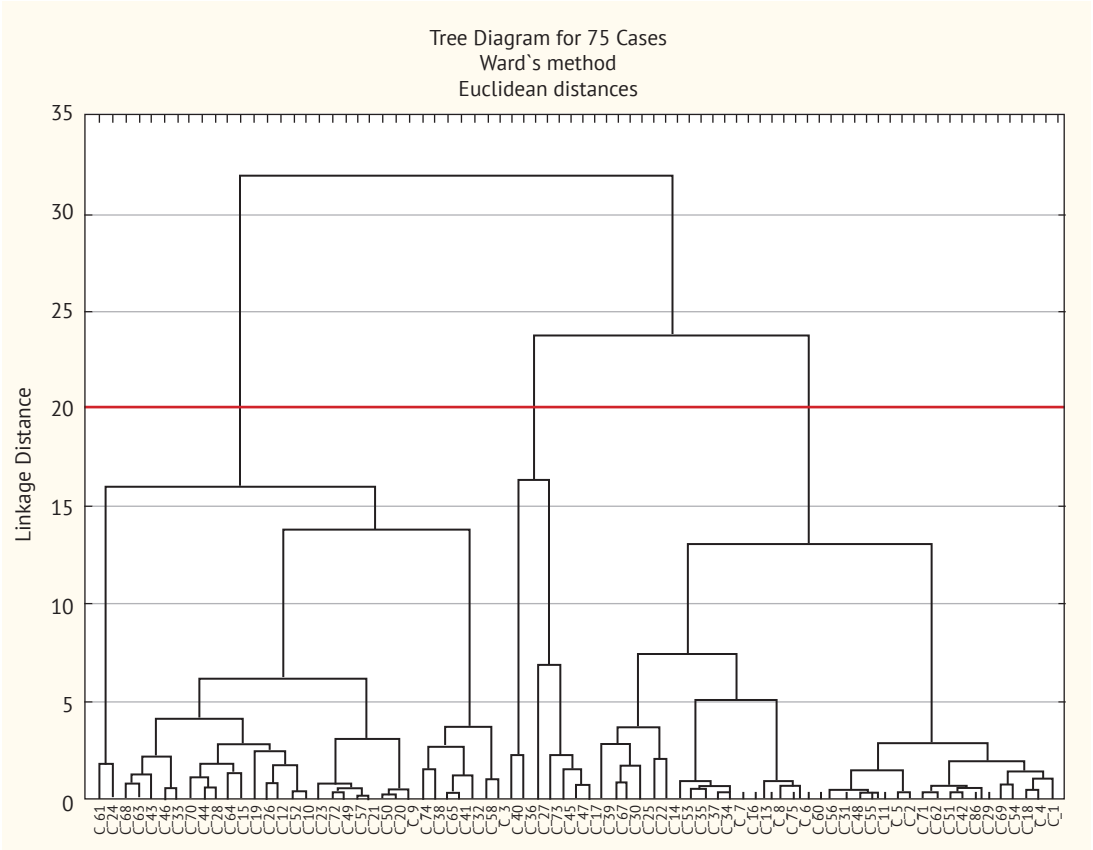

Figure 1. *Dendrogram of hierarchical classification of the enterprises of Ukraine under study – producers of organic products (Euclidean distance, Ward's method)*

Source*: compiled by the authors*

Determination of intersection points in Figure 1 revealed that according to the selected factors: diversification of production (X_1); expansion (reduction) of certain types of production (X_2); turnover of crops (X_3); change in volumes of organic products (X_4); change in organic soil area (X_5); change in production efficiency (X_6), appropriate division of agricultural enterprises from organic production into three or five clusters. As a result, it was assumed that the analysed enterprises form three clusters (highlighted by a red line in Fig. 2). Considering the results of visual analysis, further evaluation according to the k-mean method was based on the distribution of data into 3 clusters (Table 1).

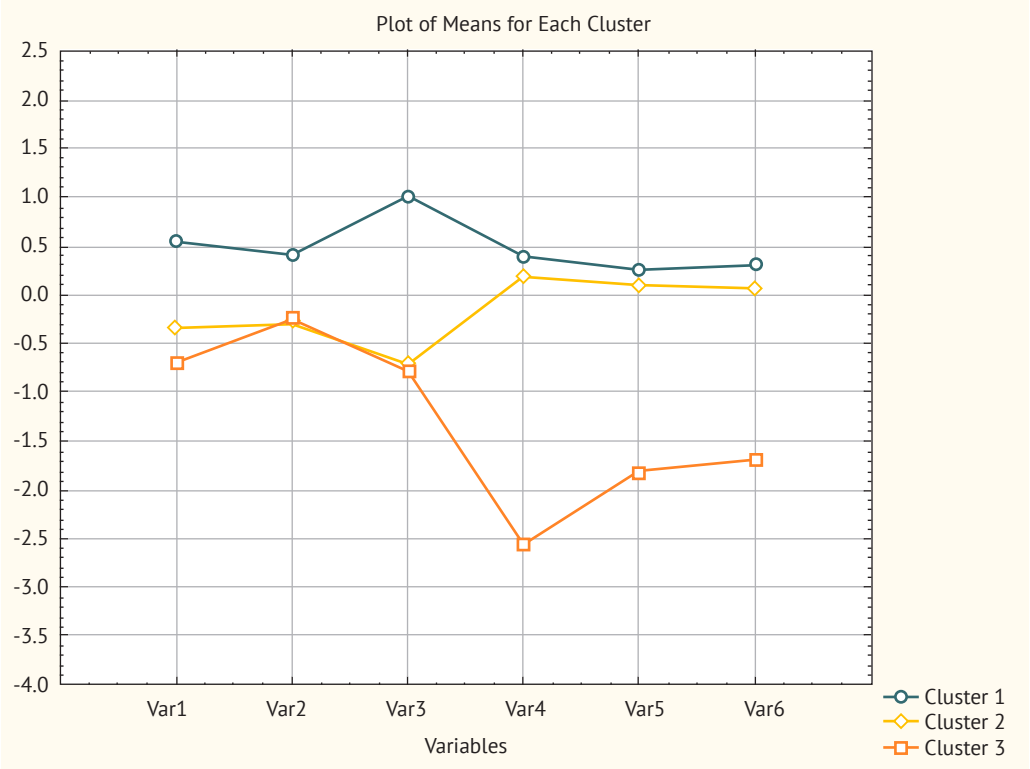

Figure 2. *Graphical representation of the ratios of standardized parameters in clusters 1-3*
Source: *calculated by the authors*

Table 1.*Characteristics of clusters of agricultural enterprises of organic crop production in Ukraine obtained by the k-mean method*

Parameter	Cluster 1 n=31	Cluster 2 n=7	Cluster 3 n=37
X_1	0.550099	-0.70018	-0.328427
X_2	0.411856	-0.26930	-0.294119
X_3	1.021662	-0.76076	-0.712060
X_4	0.372646	-2.54692	0.169632
X_5	0.276719	-1.80607	0.109843
X_6	0.300952	-1.68319	0.066292

Source: *calculated by the authors*

Enterprises of the first cluster are characterized by the highest values of all analysed parameters. They mostly expand the sown areas for organic crop production, increase the volume of production of organic products, mostly increase the efficiency of operational activities, and also implement a policy of diversification – although the number of cultivated plant species of the enterprises of this cluster starts with two, but the average value for the entire group is 5.06≈5. This is much more than in other groups. The volume of production of certified organic products is 1.2-1.6 times less than that of enterprises of the third group, and the size of certified land plots is 1.2-2 times.

Therewith, the efficiency of enterprises in this cluster increased the most among the analysed groups. The increase in efficiency is the result of the fact that enterprises of this cluster are actively experimenting with new plant species, actively introducing new ones (61% of enterprises), or replacing already grown types of products (32%), choosing the optimal product structure of the product range to ensure competitiveness (Fig. 3). Therewith, only 7% of the analysed enterprises reduced the types of organic crops grown. In general, the strategy of enterprises of this cluster can be described as active, innovative, aimed at finding new more promising areas of activity, as well as at developing and certifying new plant species.

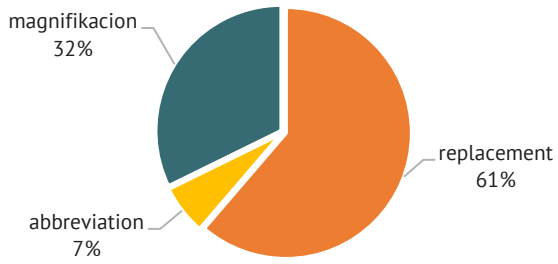

Figure 3. *Distribution of organic production enterprises of the first cluster aimed at growth or reformatting the strategy's activities, %*
Source: *calculated by the authors*

As a result of the analysis, enterprises with the lowest X_1-X_6 indicators were assigned to the second cluster. Although there are only seven such enterprises, they differ essentially from others in that they reduce the area of organically certified land, reduce the volume of organic products, and the efficiency of all firms in this group substantially decreased in the analysed period. In addition, the analysed enterprises pursue a fairly conservative development policy, since during the analysed period they either did not change the plants grown, or even reduced their number (Fig. 4). Therewith, the reduction in the types of plants grown did not help optimize production, as evidenced by a decrease in the efficiency and market share of each of the group's enterprises. A sharp reduction in the volume of organic products of the enterprises under study can be caused by several reasons. Firstly, the growing conditions or the product itself may not meet the requirements for obtaining a certificate of conformity, which is determined by current compliance control. Or the management of enterprises decided to implement a cost-saving strategy by increasing the volume of growing non-organic products.

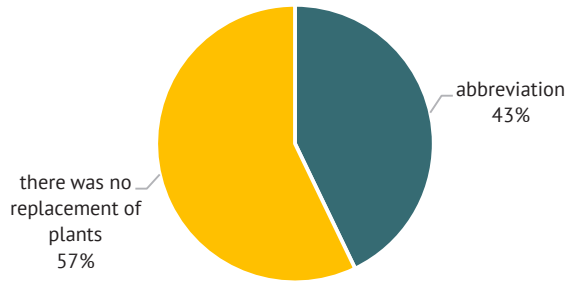

Figure 4*. Distribution of organic production enterprises in the second cluster survival or reduction strategies, %*
Source: *calculated by the authors*

Enterprises of the third cluster pursue a fairly moderate strategy, without sharply increasing the area of certified land and the volume of organic production. The average number of organic products grown per enterprise is 2.8≈3. Therewith, the group has a conservative approach to the implementation of activities, since 57% of enterprises did not change the plant species they cultivated, did not try to expand their activities, and 38% of enterprises generally reduced the number of types of products subject to certification. In contrast, only 25% increased the number of certified types of products, and no company of the group made changes in types of products (Fig. 5).

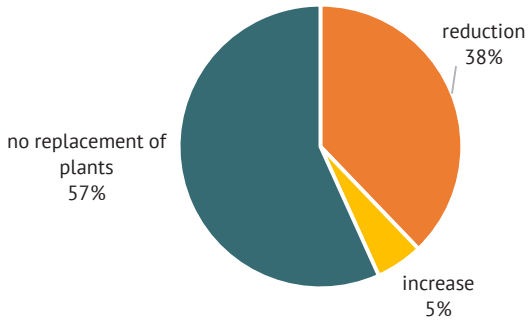

Figure 5. *Distribution of organic production enterprises of the third cluster, strategies to preserve or reduce the enterprises of the cluster, %*
Source: *calculated by the authors*

For the possibility of classification of new enterprises engaged in the production of organic products, we will create classification functions using discriminant analysis. The criteria for evaluating the quality of the created models should be the following indicators: Wilks' Lambda (λ); Partial Lambda λΛ; Fisher's F test; significance level of the F-criterion/p-level; tolerance (toler), and the multiple correlation coefficient 1-Toler (R-Sqr.) (Boedeker & Kearns, 2019; Tian *et al.*, 2022; Kei *et al.*, 2023).

Wilks's lambda (λ) is a measure that suggests the degree of distribution of a data set on a population. The indicator is measured on a scale from 0 to 1. The more λ approaches the maximum value, the worse the relationship of the resulting equation distributes data across populations. The lower the value of λ, the better the separation capacity of the obtained equation (Boedeker & Kearns, 2019). Partial lambda shows how much a single variable contributes to general discrimination. By analogy with Wilks' Lambda, the partial lambda has a greater effect on the distribution of data into separate independent groups if its value approaches zero, and if this measure is close to one, then the discriminating power of an individual factor is small.

The value of the indicator "tolerance" (Toler.) indicates a strongly separate variable affecting the separation power of the model. The larger the given meter, the smaller the contribution to the overall function of the individual factor. As a result, the four most influential and significant factors in terms of separation ability were selected to create discriminative functions (Table 2).

Table 2. *Result of step-by-step discriminant analysis of organic production enterprises*

Seq. No.	N=75	Wilks' Lambda	Partial Lambda	F-criterion (2.51)	p-level	Toler.	1-Toler.(R-Sqr.)
1	X_4	0.112050	0.855867	5.64161	0.005440	0.539107	0.460893
2	X_3	0.165672	0.578852	24.37312	0.000000	0.836891	0.163109
3	X_1	0.139216	0.688859	15.13117	0.000004	0.829553	0.170447
4	X_6	0.118393	0.810013	7.85737	0.000860	0.475375	0.524625

Source: *calculated by the authors*

The number of model steps is 4, the number of observations is 75, F(12,134)=24,102 p<.0000. The analysis of tabular data helped determine that the cumulative value of Wilks' lambda (λ) is 0.118, which indicates a sufficiently strong separating power of the model, since the value of the indicator is closer to zero than to one. Notably, the level of discrimination will improve if λ is closer to 0. The review of the indicators presented in Table 2 and the statistical characteristics of these indicators showed that the presence of the variable X_4 "increase in the production of organic products" in the discrimination procedure has the greatest impact on the discriminating power of the model (has the smallest value of partial lambda = 0.112 among all the factors analysed, which shows the unit contribution of the factor to the separating power of the model). Apart from X_4, variables X_3 (product strategy – increase, reduction, replacement or long-term cultivation of selected types of organic plants), X_1 (diversification of activity – number of species certified as organic plants grown by one producer), X_6 (change in activity efficiency) contribute to general discrimination. Using these variables, it is possible to divide new enterprises into groups and determine the most successful strategy for each group. During discrimination, two indicators were discarded, since the level of statistical significance of factor exclusion from the p-level analysis exceeds 0.05 (Table 3).

Table 3. *Factors that were discarded as a result of the analysis*

Seq. No.	N=75	Wilks' Lambda	Partial Lambda	F-criterion (2.51)	p-level	Toler.	1-Toler.(R-Sqr.)
1	X_5	0.104699	0.915955	3.07386	0.052818	0.352064	0.647936
2	X_2	0.104163	0.920672	2.88646	0.062736	0.858213	0.141787

Source: *calculated by the authors*

To estimate how accurately four factors were selected for dividing different enterprises into separate populations, 2 discriminant functions were calculated. The number of functions is selected according to the rule of the number of variables (75) or the number of aggregates (3) minus one, depending on which of the numbers is smaller.

Table 4 shows which of the roots are statistically significant by consistently applying the significance criterion.

Table 4. *Results of canonical analysis with stepwise criterion for canonical roots*

Removed roots	Chi-square is a criterion for the sequence of removing roots	Canonical correlation r	Wilks' Lambda	Chi-square	Number of degrees of freedom	Significance level (P)
0	3.393191	0.878849	0.095900	162.9393	12	0.000000
1	1.373569	0.760719	0.421306	60.0754	5	0.000000

Source: *calculated by the authors*

According to Table 4, it can be argued that one or more roots are statistically significant, since the probability obtained in the first row of the table (before excluding canonical roots) is lower than the generally accepted criterion of statistical significance (0.001-0.05). The same situation is observed after the removal of the first root – the significance level p is many times lower than generally accepted criteria, and therefore we can conclude that both roots are statistically significant and can be used to divide organic production enterprises into groups based on the potential for future development as a basis of the future strategy.

Comparing the two functions with other meters, we see that for the first one, the canonical correlation coefficient is 0.8789. This value is close to unity, which is the maximum value, which means that when using the first function, 87.89% of the variance of the dependent variable is explained by the proposed model, and the second function explains only 7.607%. According to the Wilks' lambda metric, it can be concluded that the first function has a higher resolution, and therefore will be able to more accurately classify new enterprises into one of the groups (leaders, conservatives, unstable enterprises). Individual equations intended for the classification of enterprises are presented in Table 5.

Table 5. *Classification functions for different groups of organic production enterprises*

Variable	G_1:1	G_2:2	G_3:3
X_4	0.68791	-7.8781	0.91410
X_3	1.84499	-0.5061	-1.45006
X_1	1.25661	-1.7060	-0.73007
X_6	0.64416	-2.3878	-0.08795
Constant	-2.19780	-15.1871	-1.29520

Source: *calculated by the authors*

Figure 6 presents the distribution of enterprises by group. It can be seen that the enterprises of the 2nd group are clearly distinguished from the enterprises included in the 1st and 3rd groups, while the aggregates of enterprises of the 1st and 3rd groups may overlap. This is quite logical, since it is often difficult to distinguish between enterprises that will have high growth rates in the future and enterprises that expect a moderate rate of development. Perhaps, to improve the separation ability, it is advisable to search for additional parameters or estimated indicators. However, the resulting equations have sufficient discrimination capabilities and can be applied in practice.

As a result, the equations for each of the groups are obtained as follows:

Group 1 (leadership, success, development)

$$y_1 = 0.6879 \cdot x_4 + 1.845 \cdot x_3 + 1.257 \cdot x_1 + 0.644 \cdot x_6 - 2.198 \quad (3)$$

Group 2 (reduction of activity)

$$y_2 = -7.878 \cdot x_4 - 0.5061 \cdot x_3 - 1.706 \cdot x_1 - 2.388 \cdot x_6 - 15.187 \quad (4)$$

Group 3 (conservative policy, moderate development)

$$y_1 = 0.9141 \cdot x_4 - 1.45 \cdot x_3 - 0.73 \cdot x_1 - 0.088 \cdot x_6 - 1.295 \quad (5)$$

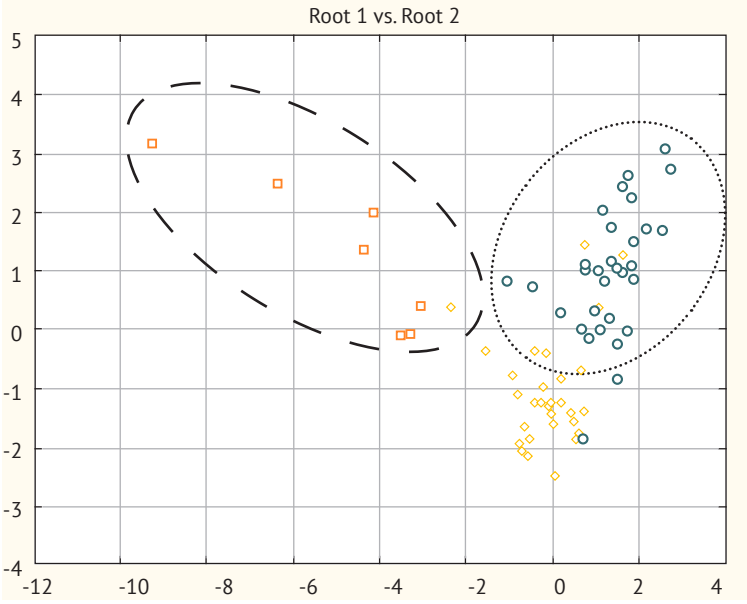

Figure 6. *Scatter diagram of canonical values for organic production enterprises of groups 1-3*
Source: *calculated by the authors*

Using the created equations, it will be possible to classify new cases in the future. The enterprise will be assigned to that group, according to the equation of which the obtained value will have the maximum indicator. To check the accuracy of the created functions, we will use the classification matrix. The data in Table 6 indicate that the variables for constructing the functions were chosen successfully, and the results have a sufficient level of adequacy.

Table 6. *Classification matrix*

	Percent	G_1:1	G_2:2	G_3:3
G_1:1	83.8710	26	0	5
G_2:2	100.0000	0	7	0
G_3:3	91.8919	3	0	34
Total	89.3333	29	7	39

Source: *calculated by the authors*

From the matrix, we can conclude that among the enterprises of the 2nd group, 100% are assigned to the group correctly. This means that those businesses that are not functioning well enough and have insufficient efficiency can be easily identified using the proposed features. As for the enterprises of the third and first groups, the classification functions showed themselves quite well when grouping them (83.87% of the enterprises that are developing well and working efficiently were correctly classified, and among the enterprises that showed a moderate trend towards the development of organic production, there were 91.89% of correctly classified cases). These data are visually confirmed in Figures 3, 5, which clearly shows that the enterprises of the second group are at some distance from the enterprises of the first and third groups, which made it quite easy to classify the second group. While the set of points that mark the enterprises of the first and third groups, although they do not completely overlap, they are quite close, which makes classification difficult. The equations have sufficient accuracy, so they can be used to classify new cases, namely, to identify enterprises that can potentially achieve prominent growth rates, or, conversely, those that are likely to reduce their activities.

Organic production is developing at an active pace all over the world, it can help in solving many issues, including food transformation, ensuring sustainable development of territories and preserving the Earth. The motives of consumers for buying organic products in the world are quite different, it is concern for their health, to be in the trend of the movement for a healthy lifestyle, reasonable consumption, care for the environment and restoration of the Earth's resources. The study (Tandon *et al*., 2021) is based on the determination of favourable and inhibitory intentions to purchase organic products, in which three different theories were used to investigate the behaviour of consumers of organic products. It is established that the consciousness of buyers is associated with facilitators and inhibitors, which may mean that conscious consumers will choose organic products, since they understand that the choice of organic products will benefit not only for their own health, but also for nature. The next step is environmental well-being, which also has a positive impact on the purchase of organic products. An interesting factor that can affect purchasing power is the gender factor, which is manifested in the fact that housewives are more inclined to buy organic products, since they are aware of the usefulness of such products for their health and the health of their family. This study is quite significant for scientists because it determines the main areas in the work of the policy of advertising and distribution of organic products.

Based on the research materials, according to the EFA model, four key factors that can positively influence the level of consumption of organic products were determined, namely the naturalness of food products, their quality, trust in the producer and marketing. The developed model will allow manufacturers to develop a specific strategy to increase market share and profitability of the enterprise by satisfying consumers (Sobhanifard, 2018).

Somewhat different research results regarding the factors affecting organic production were obtained in (Hou *et al*., 2022). They suggest identifying such factors as macroeconomic, demographic, political, and agricultural production factors. The macroeconomic factor affects organic production directly through average household income and average per capita income, i.e., the higher the average household income, the higher the development of organic production in a certain area. The political factor affects through the provision of national support to organic producers, non-monetary and monetary assets that can be provided by the state, which can affect organic production directly and indirectly. The next factors are demographic factors, the scientists single out such factors as the percentage of Hispanics, whites, the percentage of non-citizens, the total population, the number of male farmers and their average age. Equally important is the factor of agricultural production, i.e., the size and number of farms, the number of labour resources. Notably, the size of the farm does not always affect the amount of organic goods produced, since productivity is more important.

Of great importance for the development of organic production are programs aimed at the regional development of the industry. By studying the practices of European countries, scientists (Ihnatenko & Novak, 2018) managed to identify the main areas of national support, ways of their implementation and ways of improving them. They also allocated resources that can influence the development of organic production in the future. The program of implementation of national support for organic production at the regional level proposed by scientists can be proposed for implementation at organic enterprises, in rural communities, and in government bodies. Such national programs for the development of organic production are very relevant, since they are based on strengthening regional, informational and advisory components and are aimed at preserving and restoring resources and will be able to implement employment of the rural population.

The search for ways to develop organic agriculture, specifically, the determination of the best development strategies for producers, is relevant. Thus, the study (Aghasafari *et al*., 2020) determined the strategies for the development of organic agriculture in Iran based on SWOT analysis data. The study revealed 9 possible strategies for the development of organic agriculture, and scientists singled out the three most successful strategies: the first is the development of a program that would inform consumers about the benefits of organic products, the second is the creation of a competitive market for organic products, while the third is the implementation of organic education and teaching the basic principles of organic farming.

The development of the market for organic products and the interest in organic products on the European market of the Ukrainian producer prove that Ukraine has all the prerequisites for entering the world market and meeting the needs of growing consumer demand for environmentally friendly products around the world (Bogomolova *et al*., 2021). The competitive environment of the market of organic products is one of the areas of research of scientists, since the determination of methods of ensuring competitiveness, specifically, the determination of the competitive advantages of organic products will help develop organic production in the correct vector. That is why it is advisable to research and develop strategies for the competitiveness of producers of organic products.

Mechanisms for ensuring the competitiveness of the domestic organic agricultural sector should be considered using evidence from the countries of the European Union, since Ukraine, entering the world economic arena, must consider the specifics of the European organic market. Therefore, the study (Hranovska, 2017) is quite informative, specifically, the proposed mechanism for stimulating organic production by agricultural enterprises and enterprises producing organic products is important. The basis of the mechanism includes tools for stimulating organic production, which are divided into four groups: subsidy (tax concessions, loan concessions, certain compensations and subsidies); infrastructure (development of rural areas, development of laboratories, marketing research); informational; and legal.

In the study (Bilotkach, 2022), great importance for the formation of a competitive strategy of organic production is given to the institutional component, which makes provision for the introduction of certain changes to the legislative acts governing the production and circulation of organic products of Ukraine. The main areas of national support should be as follows: allocation of subsidies from the state budget for producers of agricultural organic products; reimbursement to producers of part of the cost of seeds and certification costs. Such steps, according to the scientist, can not only strengthen the internal market of organic products, but also increase the competitiveness of Ukrainian organic products on international markets. The results of this study prove that the main strategies for the development of organic producers are three areas: the strategy of re-profiling or expanding activities, diversification of production, increasing the volume of organic production and increasing the number of certified land.

CONCLUSIONS

Analysis of the activities of producers of organic products of Ukraine by dividing them into groups, depending on numerous factors, allows attracting additional tools for the formation of a competitive strategy of an organic agricultural enterprise. The factors that led to the division of enterprises into groups were diversification of production, turnover of crops, expansion or reduction of certain types of production, changes in the volume of organic products, changes in the area of organic soil, and changes in production efficiency. Using the Ward's method, it was possible to visually identify the division of enterprises into three groups, resulting in three clusters, respectively. The first cluster includes enterprises that characterize the highest value from the parallel used in the evaluation. The second cluster includes enterprises characterized by increased efficiency of enterprises. Enterprises included in the third cluster are characterized by a moderate strategy, while they do not dramatically increase either the number of organically certified lands or the number of products.

The paper suggests a strategy for the competitiveness of organic products, considering the factors of the company's own activity. The proposed classification and the created system of equations can serve as a basis for developing strategies to ensure the competitiveness of organic production enterprises.

A potential area for enterprises of the first and third groups is to ensure competitive advantages through differentiation, product expansion by varieties, types, assortment, which, unlike other markets of agricultural

products that are focused mainly on the strategy of reducing costs, should become the basis of progressive development for enterprises that operate specifically on the markets of organic products. Such a strategy is quite logical, since organic products by their very nature should stand out from other similar products on the market due to higher quality, compliance with the principles of sustainable development and green economy, healthy lifestyle, environmental friendliness and satisfaction of consumer needs for healthy food. The strategy of development of the unique value of the product is recommended to be used by producers who are focused on the retail market of EU countries.

Prospects for further research are the search for new success factors of the strategy of organic production enterprises, the creation of new discrimination equations based on them, as well as the development of a number of economic and mathematical models for enterprises of different sizes, types of activity, and regional affiliation.

ACKNOWLEDGEMENTS

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Формування конкурентної стратегії підприємства з органічного виробництва основі дискримінантного аналізу

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Анотація. У статті запропоновано додатковий інструментарій, який дозволить обґрунтовувати формування стратегії майбутнього розвитку з урахуванням потенційного зростання або скорочення діяльності, що є актуальним для виробників органічної продукції, оскільки врахування потенційної траєкторії розвитку дасть можливість убезпечити підприємство від необґрунтованих рішень у разі скорочення діяльності і дозволить задіяти існуючі резерви у разі майбутнього зростання, що є актуальним і досить затребуваним. Метою роботи було довести чи спростувати гіпотезу про вплив на розвиток органічної продукції ряду чинників, а також визначення подальшої стратегії діяльності підприємства. Для цього проаналізовано дані 75 українських підприємств, що здійснювали вирощування органічної продукції. Розподіл підприємств на групи в залежності від обсягів та темпів зростання і виявлення чинників, що впливають на майбутній розвиток виробників органічної продукції здійснено за допомогою кластерного та дискримінантного аналізу. Чинниками, які суттєво впливають на майбутній розвиток та дозволили розподілити досліджувані підприємства на групи, стали диверсифікація виробництва, заміна культур, зміна обсягів виробництва органічної продукції, зміна ефективності виробництва. Тоді як чинники «відсоток нових (або виведених із виробництва або не сертифікованих) у новому році культур до загального обсягу виробництва минулого року» та «зміна площі органічного ґрунту» не показали достатнього впливу на розподільчу здатність моделі, та були виключені з подальшого аналізу. Запропоновано формувати стратегію підприємств-виробників органічної продукції на основі диференційованого підходу для трьох різних груп підприємств, а саме: тих, що потенційно мають високий потенціал, швидкість розвитку і розширення діяльності; тих, що потенційно чекає скорочення та зменшення випуску органічної продукції; тих, які розвиваються помірними темпами. Отримані рівняння можна використовувати у практичній діяльності для додаткового обґрунтування стратегії розвитку виробників органічної продукції

Ключові слова: конкурентні переваги; сталий розвиток; конкурентоспроможність; чинники успіху; органічна продукція