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# INCREASING COMPETITIVENESS OF THE ENTERPRISE BY IMPROVING LOGISTIC STRATEGY OF DISTRIBUTION OF PRODUCTION AND SUPPLY OF RAW MATERIALS

Urgency of the research. In modern conditions, functioning of the business is one of the main components of increasing the competitiveness of the enterprise not only optimization of production costs without deteriorating the quality of the manufacture of products, but also the definition of optimal logistic routes of transportation from the point of manufacture to the place of consumption of products, taking into account the capacity of the market, purchasing power of consumers and the costs of transportation.

**Target setting.** Any strategy to increase the competitiveness of goods and enterprises, in general, should be based on the development and definition of an optimal logistics strategy for the distribution of products and supplies of raw materials.

Actual scientific researches and issues analysis. The works of B. Burkynskyi, T. Burtsev, S. Klymenko and other scholars research various aspects of theory and practice of competitiveness as an element of management of the enterprise.

**Uninvestigated parts of general matters defining.** Still unresearched and unpublished in periodicals, there are issues related to the definition of optimal transportation routes.

The research objective. Systematize the views of the domestic and foreign scientific community and provide recommendations for improving the logistics strategy of distribution of products and supply of raw materials as a component of increasing the competitiveness of the enterprise.

The statement of basic materials. The article defines the factors and criteria for assessing the competitiveness of enterprises. The analysis and trends in the dynamics of changes in the volume of cargo transportation at the macro level were revealed. The work analyzes the activity of enterprises of Kherson region and gives recommendations on improvement of logistic operation.

**Conclusions.** The work substantiates methodical approach to the determination of optimal routes of distribution of production and supply of raw materials. It was proved the need for more reliable studies on the purchasing power of potential consumers.

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# ПІДВИЩЕННЯ КОНКУРЕНТОСПРОМОЖНОСТІ ПІДПРИЄМСТВА ШЛЯХОМ УДОСКОНАЛЕННЯ ЛОГІСТИЧНОЇ СТРАТЕГІЇ РОЗПОДІЛУ ПРОДУКЦІЇ ТА ПОСТАЧАННЯ СИРОВИНИ

Актуальність теми дослідження. У сучасних умовах функціонування бізнесу однією з найголовніших складових підвищення конкурентоспроможності підприємств стає не лише оптимізація виробничих витрат без погіршення рівня якості при виробничтв продукції, а й визначення оптимальних логістичних маршрутів транспортування від пункту виробництва до місця споживання продукції з урахуванням ємності ринку, купівельної спроможності споживачів й обсягів витрат на транспортування.

Постановка проблеми. Будь-яка стратегія підвищення конкуренто-спроможності продукції й підприємства взагалі повинна базуватися на розробці та визначенні оптимальної логістичної стратегії розподілу продукції й постачання сировини.

Аналіз останніх досліджень і публікацій. Різним аспектам теорії і практики конкурентоспроможності як елементу управління діяльністю підприємства присвячені роботи Б. Буркинського, Т. Бурцева, С. Клименка та інших науковців.

Виділення недосліджених частин загальної проблеми. Малодослідженими та не розкритими у періодичних літературних виданнях залишаються питання, пов'язані із визначенням оптимальних маршрутів перевезень.

Постановка завдання. Систематизація поглядів вітчизняного та зарубіжного наукового товариства й надання рекомендацій щодо удосконалення логістичної стратегії розподілу продукції та постачання сировини як складової підвищення конкурентоспроможності підприємства.

cmammi Виклад основного матеріалу. визначено критерії фактори ma оцінки конкурентоспроможності підприємств. Проведено аналіз та виявлено тенденції щодо динаміки змін обсягів перевезення вантажів на макрорівні. Проаналізовано діяльність підприємств Херсонщини надано рекомендації щодо удосконалення логістичної діяльності.

Висновки. Обґрунтовано методичний підхід до визначення оптимальних маршрутів розподілу продукції та постачання сировини. Доведено необхідність проведення більш достовірних досліджень щодо рівня купівельної спроможності потенційного кола споживачів.

**Keywords:** competitiveness, product distribution, supply of raw materials, road and water transportation, purchasing power.

**Ключові слова:** конкуренто-спроможність, розподіл продукції та постачання сировини, автомобільно-водні перевезення, купівельна спроможність.

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**Urgency of the research.** In the contemporary conditions, functioning of the business represents one of the leading components of increasing the competitiveness of the enterprise not only optimization of production costs without deteriorating the quality of the production of products, but also the definition of optimal logistic routes of transportation from the point of manufacture to the place of consumption of products, taking into account the capacity of the market, purchasing power of potential consumers and the costs of transportation and the passage of obligatory customs procedures (in case of export). Moreover, when organizing the export of products, the question arises about determining the optimal volumes of the transportation batch, in which the optimum between transportation and storage costs is achieved, as well as the suitability of building distribution centers, which will minimize storage costs and ensure timely delivery of products.

**Target setting.** Any strategy to improve the competitiveness of products and enterprises should be based on the development and definition of an optimal logistics strategy for the distribution of products and supplies of raw materials.

Actual scientific researchers and issues analysis. Almost all researchers of the theory of assessment and management of competitiveness are engaged in the search for a capable management system that would facilitate the rapid response of the business entity to change the external and internal business environment, adaptation to new conditions. Different aspects of theory and practice of competitiveness as an element of the management of the enterprise are researched in the works of B. Burkynskyi [3], T. Burtseva [4], S. Klymenko [8], H. Koposov [9] and other scholars. The theoretical and practical aspects of the formation and implementation of the logistics strategy for the distribution of products and supplies of raw materials are the primary issues in the works of famous domestic and foreign scientists, including L. Balabanova [1], O. Bilovodska [2], H. Hohol [6], S. Kamilova [7], Z. Liulchak [10] et al. Despite considerable work, there remain problems requiring particular scientific analysis. In particular, insufficient attention is paid to the study of the justification of the formation of a logistics strategy for the distribution of products and supplies of raw materials as one of the components of optimizing the cost of economic activity, which can be considered as a basis for increasing the competitiveness of enterprises of all forms of ownership.

Uninvestigated parts of general matters defining. Not enough-researched and unpublished parts in periodicals issues remain related to the definition of optimal routes of transportation to minimize transport and storage costs while maximizing the volume of proceeds from sales of products to a potential consumer group.

**The research objective.** The primary purpose of the study comprises the systematizing of the views of the domestic and foreign scientific community and provides recommendations for improving the logistics strategy of product distribution and supply of raw materials as a component of increasing the competitiveness of the enterprise.

The statement of basic materials. One of the evaluation criteria of a competitive position of an enterprise is its competitiveness. There is a large number of interpretations of the term "competitiveness" both regarding products and enterprises in general. However, most definitions and developed methodological approaches to assessing the level of competitiveness of products and enterprises, in general, are vague and do not take into account the specifics of the functioning of the identified economic entity and the peculiarities of the development of the respective administrative-territorial unit. In addition, the competitiveness of the company depends on a number of factors, such as market capacity, ease of access to the market, the type of manufactured goods, homogeneity of the market, the competitive position of enterprises already operating in this market, the possibility of technical innovations in the industry [3].

In general, competitiveness represents the ability of an object to withstand competition in comparison with similar objects in a competitive environment. The competitiveness of an object is determined by the results of market research, market segmentation [4]. The most generalized competitiveness of an enterprise can be defined as the potential or realized ability of an economic entity to effectively long-term functioning in a suitable external environment. Consequently, the competitiveness of the enterprise according to the views of the authors [8]: based on the competitive advantages of the enterprise; determines the ability of an enterprise to withstand competition in a particular market; reflects the position of this enterprise relative to its competitors.

The notion of competitiveness of economic entities should be understood as the ability of an object to respond adequately to changes in the external and internal business environment to ensure profitability at least at medium-level level. To achieve long-term success, the work on ensuring the competitiveness of the enterprise should be carried out in all spheres and all aspects of its activities.

The results of previous studies [9] show that when calculating the level of competitiveness of enterprises it is necessary to take into account the factors that determine the level: reliability of information on markets for finished products and production resources; technological and resource weaponry of production processes; adaptability to changing external conditions of the organizational system of the enterprise (availability of a sufficient period of time for the organization of the corresponding reaction). Since all these factors must be present at the same time, then the level of competitiveness can be calculated only when they are combined into logical multiplication, that is, the competitiveness index should be calculated as follows:

де  $I_c$  - competitiveness index;

 $I_{inf}$  – reliability index of information;

 $I_{c}$  – the index of armament.

The reliability index of information can be calculated as the multiplication of the reliability indexes of information on the markets for finished products and production resources.

In determining the reliability indices of information on the markets for finished products and production resources, it is necessary to ensure the use of a reasonable logistic strategy for the distribution of products and the supply of raw materials, which is also one of the ways to increase the competitiveness of the enterprise. Managerial decisions must be made before implementation, taking into account the logistic approach. The said will allow determining the optimal amount of raw material supply to the points of production and final products to the potential consumer to minimize the costs of storage and storage, which, in turn, will maximize profits.

The analysis of volumes of transportation of cargoes in general in Ukraine by main types of transport in the period from 2008 to 2016 [5] shows that the reduction of amounts of cargo transportation occurred in general for all kinds of traffic. The most significant reductions were observed on water (decrease almost triple in 2016 compared to 2008) and rail (by 31.01%) transport. Also, there was a decrease in volumes of carriage of goods with the use of motor vehicles (by 10.56% compared to 2008). The average distance of cargo transportation was only 225 km by road to 544 km by rail and 597 km using water transport vehicles. And this is not taking into account the fact that the distance between the extreme northern and southern points of Ukraine is 893 km, and between the western and eastern ones - 1316 km.

The above analysis of statistical indicators for the transportation of goods shows the imperfection of existing logistics concepts for the distribution of products and supplies of raw materials used by domestic business structures, as a result of which transportation is carried out only between adjacent regions, or exclusively to metropolitan areas.

On the example of the subjects of management of all forms of ownership of the Kherson region, it was established that the logistics strategy is an instrument for realizing the primary plan of the enterprise: strategy for increasing the competitiveness to maximize profits. The model of the logistics strategy of the enterprise should be a functional program of activities, which would be a guarantee of strengthening its competitiveness.

One of the components of further development of agricultural enterprises is the participation in combined, segmented or intermodal transportation. Combined transportation is based on the connection in the process of shipping on mutually beneficial conditions of different types of transport. Extension of some services through multimodal traffic can be carried out in several directions. First, the combination of road transport with river and sea [1] deserves attention. Road and water transportation becomes most useful when a significant part of the route is carried by water transport.

On the example of the State Enterprise "Kherson River Port" and its successors (Kherson), it was established that the promising area of activity of the enterprise is the organization of close cooperation with construction companies of the Kherson region for the supply of building materials. To determine the appropriateness of the organization of the cooperation mentioned above, it is necessary to calculate the total cost of transporting building materials using automobile twenty-ton carts and water vehicles. On the balance of the successor of the State Enterprise "Kherson River Port," there is a dry cargo barge-platform with a tank, a youth and a cargo bunker on a deck with a displacement of 2000 thousand tons. According to the present technical characteristics, taking into account the loading factor of the barges, the proposed vessel can carry 497448 units bricks, the total weight of the cargo will be about 1989.8 t. The cost of transportation of blocks will be lease of barges - 2700 UAH per day; Rent of tugboat for barges - 2600 UAH per year.

During the calculations it was taken into account that in the years 2017-2018 for the construction of the primary objects in Kherson, the construction enterprises of the city (LLC "Pivdenenergo" and its partners) are purchasing and supplying bricks from warehouses in Kakhovka (Kherson region) The distance between the point of delivery and consumption for water vehicles is about 60 km (about 3 hours in one direction), for cars - 89 km. The time for loading and unloading 497448 units bricks will last at least 5 hours. Total costs for transportation of products using fully loaded barges will be 31300 UAH.

For renting premises for storage of bricks in Kakhovka, the company is forced to pay about 13.33 UAH per 1 sq. km. per month, while in Kherson these costs will be 30 UAH per 1 sq. km. The need for warehouses is one sq. m. for storage 420 units bricks The moon's necessary for the block can be stored directly on the construction site. The average demand of a brick-and-mortar enterprise for the construction of multi-story buildings is about 100 thousand units per month.

Taking into account the above information in Tab. 1, the calculation and determination of the optimal batch of transportation of raw materials and materials, taking into account the costs of storage and storage.

Table 1
Calculating the size of batches by the method of the least average costs during transportation and storage of bricks

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Months	Ordered quantity, thousand units	Expenditures on transportation, UAH	Additional storage costs, UAH	General expenses, UAH	Average costs UAH / ths. units			
1	100	20900	•	20900	209			
2	200	23500	3969,05	27469,05	137,35			
3	300	26100	11907,15	38007,15	126,69			
4	400	28700	23814,3	52514,3	131,29			
5	500	31300	39690.49	70990.49	141.98			

The performed calculations show that it is expedient for OOO "Pivdenergo" and its partners to transport and store bricks in the warehouses of Kherson in the total volume of 300 thousand units that will meet the need for construction work within three months. Average transportation and storage costs

will be minimal and will amount to 126.69 UAH per 1 thousand units of bricks. Total cost for a party in 300 thousand units of blocks will amount to 38,007.15 UAH.

In case the company uses twenty-tone trucks, with an average freight fare of about 16.4 UAH / km and a capacity of a box of about 4620 units of bricks (without violation of the current legislation), the total cost of renting one wagon will be about 2919.2 UAH. In total for three months for the transportation of bricks totaling 300 thousand units, it will be necessary to hire 65 twenty-tin trucks, the total cost of transportation costs - 189748 UAH. Given the low transport batch size, there will be no additional costs for its storage.

The performed calculations show that in order to minimize the costs of transportation and storage of building materials, LLC "Pivdenenergo" and its partners should use the services of the successor of the State Enterprise "Kherson River Port" for leasing barges with a displacement of 2000 thousand tons for the transport of bricks with a total of 300 thousand units. To meet the three-month construction needs. In this case, the transportation and storage costs will be almost five times smaller in comparison with the use of twenty-tonne lorries, which confirms the expediency of establishing close cooperation between the construction enterprises of Kherson and the successor of the state enterprise "Kherson river port". However, to make more reliable calculations, it is necessary to take into account also the location of raw materials in Kakhovka and construction sites in Kherson, and therefore the costs of transporting raw materials from warehouses in Kakhovka to water transport vehicles, as well as from loaded barges to construction sites in Kherson. The proposed combined logistic carriage by road and water will be practical and expedient if the total distance between warehouses, berths for water vehicles and construction sites will not exceed 70 km.

For agricultural enterprises of the Kherson region, it would also be advisable to consider the possibility of organizing transportation of products for export to the EU countries and other potential foreign consumers. As an example of the agricultural PRK named after Kirov, it was established that in modern conditions, the limited sources of financing, in order to maintain the existing positions and increase the competitiveness of products and enterprises in general in a particular segment of the market, it is necessary to determine the optimal cost boundary between transportation and warehousing of products in the organization of its implementation in the demands of the EU countries and the CIS. At present, it is the most economically advantageous place to locate its warehouses, namely, the international logistics centers. It is due to the high cost of storage facilities and the high level of storage fees in warehouses, in particular in Kyiv [10].

Taking into account the specifics and volumes of the economic activity of the Agricultural PJSC named after Kirov, it is expedient to consider the possibility of exporting products to EU countries using twenty- and ten-tier trucks. The average cost of transportation of goods is: for a twenty-tonne wagon - 16.4 UAH per km, ten-ton - 15.3 UAH per km. For company management, it is necessary to determine the optimum volume and frequency of transportation of products to ensure its successful implementation in the relevant market of a specific EU country. It is also necessary to take into account the level of purchasing power of the population, and, consequently, to adjust the cost of sales of products.

Taking into account the specifics of the economic activity and the features of the cultivated production, the total area of cargo to be delivered to a particular EU country will be: for a twenty-ton car 30.6 square meters (14 tons), for ten-ton - 16 square meters (7 tons). The most extended implementation period will be one week. For cities with an average size of fewer than 1 million people, the transport of products will use a ten-tonne wagon; more than 1 million people - twenty cars. Grown products can be stored for up to 7 days without significant loss of quality. However, daily additional revenue from sales of products in comparison with the domestic market will decrease by 2%.

The smallest difference between the prices for sales of products abroad and on the domestic market will be 0.5 euro per 1 kg for the most impoverished country of the EU - Bulgaria, where the average monthly salary for 2016 amounted to 510.92 euros or 15021.05 UAH, which is almost three

Table 2

# УПРАВЛІННЯ ПІДПРИЄМСТВОМ

times more than the same indicator in Ukraine (5183 UAH). At the same time, the additional costs when crossing the border will be at least 20% of the amount of other income.

In carrying out the analysis and taking into account the specifics of transportation and storage of products, its export can be carried out to the countries with the least cost of warehousing, that is to Warsaw (Poland), Antwerp (Belgium), Bucharest (Romania) and Sofia (Bulgaria). The necessary data for modeling the logistic cycle of product distribution is in Tab. 2.

Necessary data for modeling the logistic cycle of product distribution

Necessary data for modeling the logistic cycle of product distribution								
Locality	Distance from Kherson (Ukraine) , km	Average monthly salary in 2016, euro	Adjustment factor	Additional income from sales of products, euro / kg	Population, thousand persons	The need for a vehicle		
Warsaw (Poland)	1303	1066,67	2,09	1,05	1744,4	20-ton van		
Antwerp (Belgium)	2558	4566,67	8,94	2,24	510,6	10-ton van		
Bucharest (Romania)	809	590,77	1,16	0,58	1855,4	20-ton van		
Sofia (Bulgaria)	1185	510,92	1,0	0,5	1430,0	20-ton van		

When calculating the size of the cost, it was taken into account that for the storage of 1 ton of products an average of 2.2 sq. m storage facilities. At the time of calculations, the official euro exchange rate manifests 29 UAH per 1 euro. Using the cost of storage indicated by the authors [10], Table 3 contains the calculation of the batch sizes for transportation and sales to Warsaw (Poland).

Table 3
Batch size calculation for transportation and sales to Warsaw (Poland)

Days	Order quantity, t.	Expenditures on transportation, UAH	Storage costs, UAH	Total costs, UAH	Average costs, UAH / t.
	quartity, t.		0/111	_	
1	2	42738,4	-	42738,4	21369,2
2	4	42738,4	12760	55498,4	13874,6
3	6	42738,4	38280	81018,4	13503,07
4	8	42738,4	76560	119298,4	14912,3
5	10	42738,4	127600	170338,4	17033,84
6	12	42738,4	191400	234138,4	19511,53
7	14	42738,4	267960	310698,4	22192,74

Calculations show that a minimum of average costs per one ton of product is achieved when the amount of the transport batch is sufficient to cover the needs of three days. The agricultural PrAT of Kirov it is expedient to organize transportation of 6 tons of products every three days. It will not only improve the quality of sales and reduce the number of losses resulting from product damage but also minimize the cost of storing products, as well as rent a ten-tonne wagon. The profit from sales of products will be 10847,5 UAH / t. The total amount of weekly benefit is 151.9 thousand UAH.

A similar mechanism of calculation was also used in determining the optimal batch for the transportation of products to Antwerp (Belgium), Bucharest (Romania), Sofia (Bulgaria), namely:

- Antwerp (Belgium) the minimum average cost per ton of products is achieved when the volume of the transport batch is sufficient to cover the needs of the first six days. That is, it is expedient to organize transportation of 6 tons of products every six days. The profit from sales of products will be UAH 25,637.3 / t, the total amount of the weekly benefit will be UAH 179.5 thousands;
- Sofia (Bulgaria) it is advisable to organize transportation of 4 tons of product every two days. However, the financial result from the sale of products will be unprofitable and will amount to 1855.85

UAH / t. Taking into account the level of purchasing power of the local population, as well as the relatively long distance between Kherson (Ukraine) and Sofia (Bulgaria), transporting and storing products with a total additional income of 0.5 Euro per 1 kg is inappropriate and economically unjustified. To ensure a minimum payback, the amount of other income from each unit must not be less than 0.6 euros per 1 kg. In this case, the expected amount of additional profit will be UAH 440.95 per ton or UAH 6173.3 per one weekly amount;

- Bucharest (Romania) - it is advisable to organize transportation of 4 tons of product every two days. The profit from sales of goods will be UAH 2857.99 / t, the total amount of weekly benefit - 40.0 thousand UAH.

**Conclusions.** The results of the conducted research indicate that improvement of the logistics strategy of distribution of products and supply of raw materials is one of the most important components of increasing the competitiveness of enterprises of all forms of ownership. To minimize the costs of transporting and storing raw materials, materials and finished products it is expedient to arrange combined transport using automobile and water (river and sea) transport. The necessity of carrying out reliable researches on the determination of the level of purchasing power of potential consumers is proved. The expediency of using the method of "average expenses" in determining the optimal logistic strategy of product distribution and supply of raw materials is substantiated, which will allow to find not only the optimum point between the volumes of transportation and warehousing costs, but also, despite distance, to maximize the amount of additional income from sales of products for border compared with domestic sales channels.

At the same time, for more reliable calculations, it is necessary to take into account the location of the warehouses of raw materials and items of its consumption and take into account the additional cost of transporting raw materials from warehouses to water vehicles, as well as to consumption points.

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