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FORMATION OF AGRARIAN COMPONENT OF UKRAINIAN COMMODITY EXPORTS

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Introduction. The active movement of Ukraine towards integration into the world economy, the liberalization of customs regimes, the expansion of sales markets and the introduction of innovations have created new prospects for the progress of the production of exports-oriented agricultural products. Foreign economic activity plays a significant role in the economy of the country, affects its internal dynamics and competitiveness, so the research of trends in the formation of commodity exports are of current importance.

Aim and tasks. The aim of the article is to research the dynamics of progress and the current state of the agricultural sector of the economy of Ukraine in the field of crop production, the contribution to it of the main categories of farms and the role of the agricultural sector in the formation of the exports potential of the country. For the solvation of this problem, a number of statistical materials, scientific publications and Internet resources on the indicators of production activities of agricultural enterprises were used, the methods of mathematical statistics and economic and mathematical modeling were applied.

Results. The conducted researches allowed to evaluate the contribution of the main categories of farms to crop production in 2010-2017. To estimate the distribution of land between agricultural enterprises the Lorenz curve was constructed, the Gini coefficient and the Hoover index were calculated. Calculations showed that 81.5% of enterprises had 13.4% of the total land area, and in order to achieve an equal distribution of land between enterprises, it is necessary to redistribute 68% of the land areas. It has been established that in the agricultural sector of Ukraine there is a polarization in the production of agricultural products – small-scale forms of management dominate in the production of labor-intensive and low-income goods, while products of powerful agricultural enterprises have a high yield and low labor intensity. One of the leading places in crop production is the cultivation of sunflower due to its high profitability. Linear and multiplicative regression models of dependence of the volume of sunflower production. It was determined that high levels in the structure of commodity exports of Ukraine belong to sunflower oil, wheat, corn, barley, rapeseed and soybeans, and it was noted the important role of agricultural holdings in forming the exports potential.

Conclusions. Agricultural enterprises, in particular, holdings, which have more opportunities than households for increasing their production through the introduction of innovations and the scale of production play a growing role in the production of agricultural products . Ukraine makes a significant contribution to global food security, but its position in the world markets as a producer and supplier of raw materials is fixed. Exports of goods with a low level of added value largely depend on fluctuations in world prices, which contributes to the sensitivity of the domestic economy to external negative trends, therefore, Ukrainian commodity exports need to diversify and increase the share of high technological value added goods.

Keywords: agribusiness, agroholdings, crop production, innovation, exports, econometric model.

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ФОРМУВАННЯ АГРАРНОЇ СКЛАДОВОЇ УКРАЇНСЬКОГО ТОВАРНОГО ЕКСПОРТУ

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Вступ. Активний рух України на шляху інтеграції до світового господарства, лібералізація митних режимів, розширення ринків збуту та впровадження інновацій створили нові перспективи для розвитку виробництва експортоорієнтованої сільськогосподарської продукції. Зовнішньоекономічна діяльність відіграє суттєву роль в економіці країни, впливає на її внутрішню динаміку та конкурентоспроможність, тому дослідження тенденцій формування товарного експорту мають актуальне значення.

Мета і завдання. Метою статті є дослідження динаміки розвитку та сучасного стану аграрного сектора економіки України у галузі рослинництва, внеску в нього основних категорій господарств та ролі агропромислового комплексу у формуванні експортного потенціалу країни. Для вирішення цієї задачі використано ряд статистичних матеріалів, наукових публікацій та Інтернет-ресурсів щодо показників виробничої діяльності аграрних підприємств, застосовано методи математичної статистики та економіко-математичне моделювання.

Результати. Проведені дослідження дозволили оцінити вклад основних категорій господарств у виробництво продукції рослинництва в 2010–2017 рр. Для оцінки розподілу земельних угідь між сільськогосподарськими підприємствами побудовано криву Лоренца, обчислено коефіцієнт Джині та індекс Гувера. Розрахунки показали, що 81,5% підприємств мали 13,4% загальної площі угідь, а щоб досягти рівного розподілу земель між підприємствами, необхідно перерозподілити 68% площ земельних угідь. Встановлено, що в аграрному секторі України спостерігається поляризація у виробництві сільськогосподарської продукції – дрібномасштабні форми господарювання домінують у виробництві трудомістких і малоприбуткових товарів, у той час як продукція потужних сільськогосподарських підприємств має високу прибутковість і низьку трудомісткість. Одне з провідних місць у рослинництві займає вирощування соняшнику через його високу рентабельність. Побудовано лінійні та мультиплікативні регресійні моделі залежності обсягу виробництва соняшнику. Визначено, що високі показники у структурі товарного експорту України належать соняшниковій олії, пшениці, кукурудзі, ячменю, ріпаку і сої, та означено важливу роль агрохолдингів у формуванні експортного потенціалу.

Висновки. Зростаючу роль у виробництві аграрної продукції відіграють агрохолдинги, які мають більше можливостей порівняно з домогосподарствами для нарощування продукції за рахунок упровадження інновацій та масштабів виробництва. Україна робить вагомий внесок у глобальну продовольчу безпеку, проте на світових ринках закріплюються її позиції як виробника і постачальника сировинної продукції. Експорт товарів з низьким рівнем доданої вартості значною мірою залежить від коливань світових цін, що сприяє чутливості вітчизняної економіки до зовнішніх негативних тенденцій, тому український товарний експорт потребує диверсифікації та збільшення частки товарів високого технологічного переділу.

Ключові слова: агробізнес, агрохолдинги, рослинництво, інновації, експорт, економетрична модель.

Introduction. The agricultural sector provides the resource base of the food industry, that is the basis of food security, well-being and quality of life of the population [1, 2]. In modern conditions, the level of socio-economic development of the state mainly depends on foreign trade. The foreign trade turnover , the number of countries with which Ukraine has trade relations grow every year. The main advantage of the country is its favorable geographical position due to the sales markets: Western and Eastern Europe, the Middle East and Central Asia. Agrarians of Ukraine keep to world trends and use advanced technologies for growing plants and animals, which also contributes to the competitiveness of Ukrainian agricultural products on the world market. So, in 2017, the volume of exports of Ukrainian agricultural products amounted to $ 17.8 billion, which accounted for 41% of the total structure of commodity exports of Ukraine (in 2016 $ 15.3 billion or 42%).

At the same time, the issues of the economic mechanism for the formation and development of the exports potential of agricultural enterprises, the factors of its intensification and increase in efficiency require further consideration.

Ukrainian scientists constantly focus their attention on research and analysis of agricultural production. Especially it concerns the main exports crops of the country – grains and oilseeds. The main approaches to increasing the contribution of Ukraine to the grain segment of the world food safety system are studied [3]; the analysis of the production and sale of grain and oilseeds in the context of each crop with the determination of the level of profitability , turnover and the volume of markets is conducted [4].

A large contribution to the exports of agricultural products is made by powerful agro-industrial complexes, which have become an integral part of the organizational and legal structure of the agricultural sector of the economy [5]. In their work, researchers identified the impact of agricultural holdings on the development of agriculture in the country, considered the formation of large vertically integrated agricultural holdings, changes in macroeconomic indicators related to their activities, the role and importance of agriculture in the Ukrainian economy, identified the motivational component of integrating agricultural enterprises into agro-industrial holding structures [6-9]. Using the example of integrated formations, it is substantiated that the result of the implementation of the development strategy between sectoral integration will be a synergistic effect, which is defined as an increase in the efficiency of production activities [10]. Alongside with agrarian enterprises, a significant role in the production of agricultural products is played by rural households who own the most part of the resources. Small scale production ensures their maneuverability and adaptability. Successful activity of rural households is a prerequisite for forming an entrepreneurial class in rural areas, the level of well-being of the rural population and an important source of self-sufficiency and profit [11-12]. In Ukraine, the number of households is declining, and their share in agricultural production is reducing. During 2011-2016 the number of individual peasant farms decreased from 4.9 million to 4.2 (-14.3%), and the share in the production of gross agricultural output from 59 to 46%. Due to changes in the management of rural areas (decentralization), the development of family farms is relevant, because their further development is based on the unity of economic, social and environmental interests and activation of business in terms of income growth, employment and social protection [13].

Today, Ukraine is creating an agricultural land market, so the existing European experience should be used to ensure the functioning of a regulated, open and civilized agricultural land market. The farm model is the reference model in the EU; that's why, the regulation of the land market is carried out precisely in this context [14]. The farmer is always the most important buyer in the land market. The most similar conditions for the development of the Ukrainian agricultural land market were in such countries as Bulgaria, Estonia, Latvia, Lithuania, Poland and Romania [15]. The authors of the article [16] developed methodological approaches to the management of the competitiveness of agro-industrial enterprises, and also presented organizational and economic measures to improve competitiveness.

An important tool of modern research are the methods of economic and mathematical modeling [17-20]. Econometric studies in agriculture attract the attention of scientists from different countries. Thus, American scientists in their works demonstrate examples of the usage of econometric methods in the research of agriculture over the past 100 years [21]. One of the most effective means of intellectual analysis and forecasting of data is the apparatus of artificial neural networks, with the help of which models of regional clustering of crop and livestock production indices are built [22].

A characteristic feature of the modern development of the agrarian sector of the economy of Ukraine is a profound socio-economic transformation. The reform of agrarian relations is primarily aimed at the creation an effective owner, a favorable economic environment, search and mobilization of domestic resources for production growth and enhancement its efficiency through the introduction of innovative technologies. Innovative renewal of the capital of agricultural enterprises is the key to increasing the efficiency of their work: an increase in production and sales, a decrease in production costs, an increase in labour productivity.

At the same time, the problem of the influence of the information component of innovation on capital remains open, which is a reserve for improving the efficiency of its usage and allows developing approaches to ensure the growth of profitability of agricultural enterprises [23].

Aim and tasks. The aim of the article is to research the dynamics of progress and the current state of the agricultural sector of the economy of Ukraine in the field of crop production, the contribution to it of the main categories of farms and the role of the agricultural sector in the formation of the exports potential of the country. For the solvation of this problem, a number of statistical materials, scientific publications and Internet resources on the indicators of production activities of agricultural enterprises were used, the methods of mathematical statistics and economic and mathematical modeling were applied.

Results. The processes of internationalization, cooperation and globalization increase the interdependence and intersectionality of socio-economic relations of subjects of foreign economic activity, exacerbate competition in the global food market. In modern conditions, the country's economic policy should be aimed at expanding the production and exports of high value-added products. Notwithstanding , in order to realize the existing comparative advantages of the country and ensure the diversification of exports, it is advisable to preserve the agricultural raw materials segment in its structure. The main role for solving the problem of expanding production and exports of products is assigned to agricultural producers.

The State Statistics Service of Ukraine determines the following main categories of agricultural producers: agricultural enterprises (including farms) and households. The predominant organizational and legal form of management are farms, whose share in the total structure of agricultural enterprises and agricultural land is 74.9% and 22.9%, respectively. The shares of other enterprises engaged in agricultural activities are as follows: business associations – 15.3%; private enterprises – 7.1%; industrial cooperatives – 1.0%; state enterprises – 0.4% and enterprises of other types of business – 1.3%. The number of households in 2017 was 403 million [24].

In Europe, farms dominate nearly all branches of agriculture. Thus, in the EU, about 85% of all farms belong to farmers, who cultivate about 70% of all land. Speaking about the main agribusiness models that exist in the world, the experts cite two main ones: the “Argentine” one, in which large agribusinesses cultivate large plots of land and provide significant production of agricultural mass-market demand and consumption, and the “European” model, in which manufacture is a farmer with a family.

As of 11/01/2017, the total number of Ukrainian agricultural enterprises is 45,558; the area of their land was 19.96 million hectares. Enterprises that did not have agricultural land made up 10.6% of their total number (4823 enterprises). An analysis of the structure of Ukrainian agricultural enterprises shows that the most part of them have a small land use area:

up to 10 hectares – 12.6% of their total number; from 10.1 hectares to 100 hectares – 44.1%; from 100.1 hectares to 1000 hectares – 22.0%; from 1000.1 ha to 3000 ha – 7.8%; from 3000.1 ha to 7000 ha – 2.2%; from 7000.1 hectares – 0.7%. According to the State Statistics Service of Ukraine, in 2017 the number of enterprises that cultivated the land over 10,000 hectares amounted to 166 (0.4% of the total number of agricultural enterprises). The area of their land was 3643.1 thousand hectares – 18.3% of the total land area of agricultural enterprises.

Figure 1 shows the distribution of agricultural enterprises by the size of the land area in 2010 and 2017. And the size of these areas in 2017 is indicated.

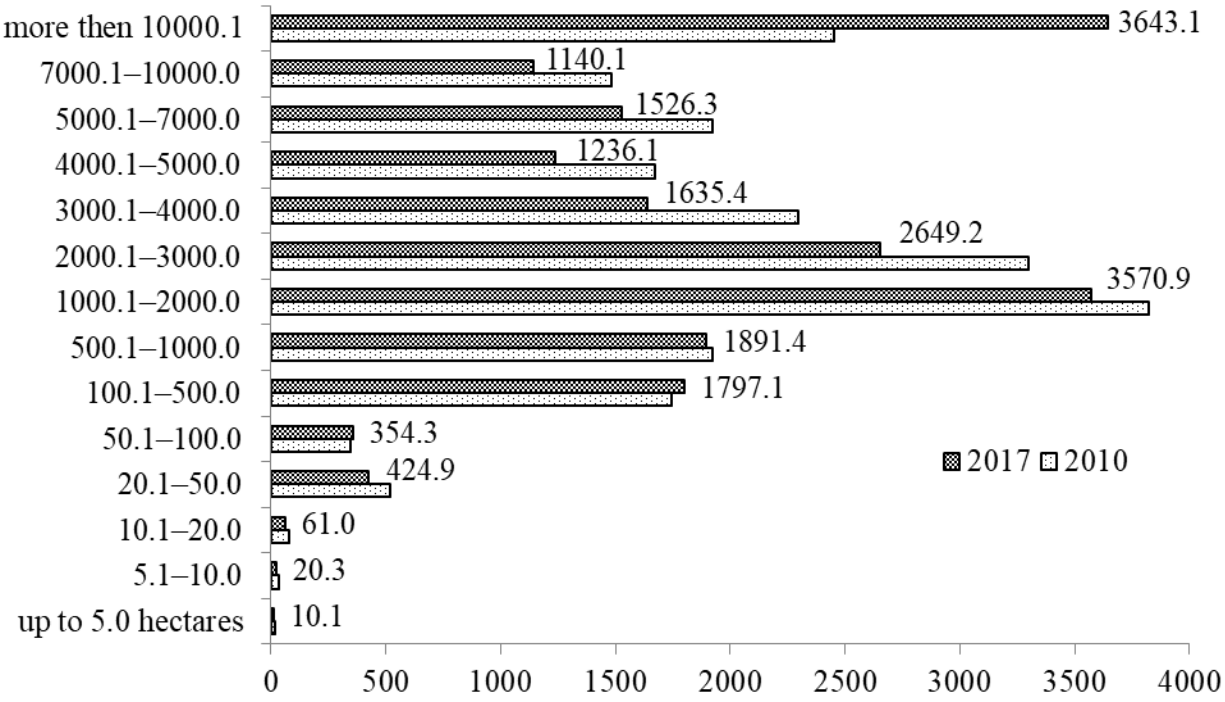

Fig. 1. Distribution of enterprises by the size of land area, ths. hectares

Source: based on data [25].

In Ukraine, a process of concentration of agricultural land occurs, and the number of small enterprises decreases due to their transfer under the control of large companies. Agricultural holdings are created by leasing land by powerful industrial enterprises, financial and service structures that invest in production and social spheres. They are actively attracting capital by issuing and placing shares on the stock market abroad, which other forms of agribusiness cannot afford. The increase in the share of agricultural holdings among other enterprises of the industry as a whole indicates a continuation of the phenomenon of scaling in the agricultural sector. The average size of the land of the agricultural enterprise, which is part of the holding, is 4850 hectares. The average value of this indicator for Ukraine, excluding enterprises of agroholdings and farms, is 1058 hectares [25].

A convenient tool for statistical estimation of the inequality distribution of economic indicators is the Lorenz curve, a function that illustrates the degree of inequality of distribution. Quantitative measures of distributional inequality are the Gini coefficient and the Hoover index. In figure 2 it is shown the Lorenz curve of the distribution of agricultural land area depending on the number of enterprises that owned the land in 2017. The calculated Gini coefficient and the Hoover index are 0.82 and 0.68, respectively. The Hoover Index characterizes the largest deviation of the Lorenz curve vertically from the equilibrium line and distributes the enterprises with the smallest and largest land area. It is calculated that 81.5% of enterprises (namely, 33,207 enterprises) had 13.4% of the total area (2,668 thousand hectares). The Hoover Index shows that it is necessary to distribute 68% of the area among enterprises in order to achieve a uniform distribution.

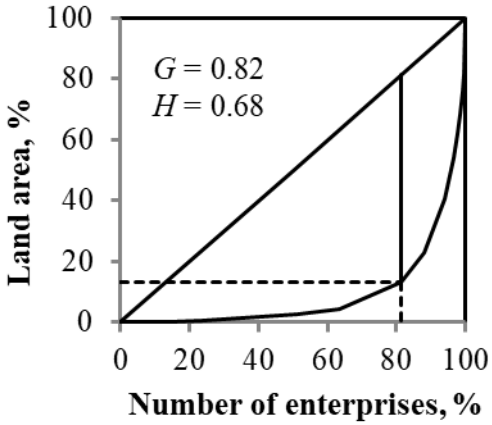

Fig. 2. The Lorenz curve of the distribution of land area depending on the number of enterprises

Source: based on data [25].

In general, the positive trend in growth of output of manufacturing of Ukrainian agricultural products in recent years can be pointed out : 187.5 billion UAH in 2010 against 247, 7 billion UAH in 2017 at constant prices in 2010 (an increase of 32%). Growth in crop production was 48%, and the contribution of agricultural enterprises to its production gradually increased (Fig. 3). In fig. 4 the structure of cultivated areas of agricultural crops by categories of farms is shown.

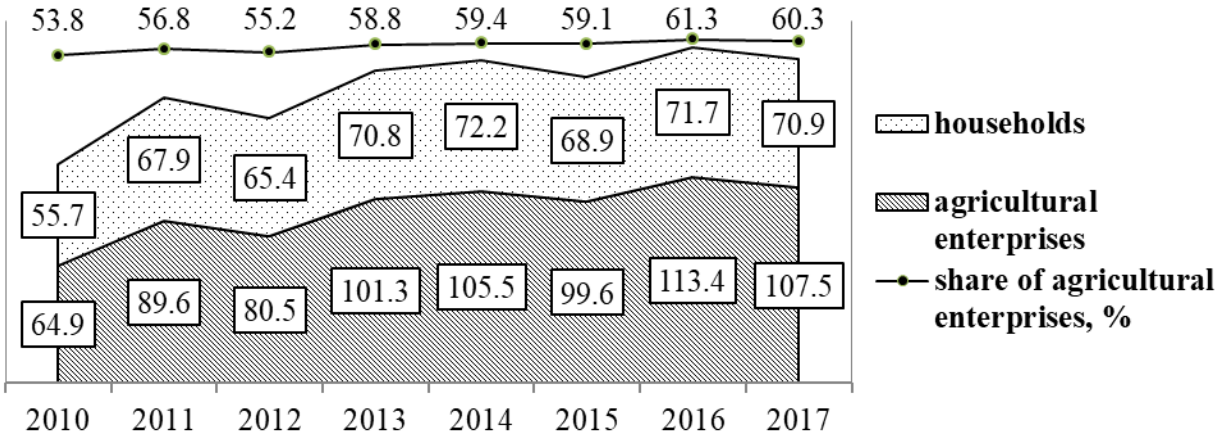

Fig. 3. Dynamics of output of crop production, billion UAH, the specific gravity of agricultural enterprises in production,%

Source: based on data [25]

Growth in output of crop production is due, in particular, to an increase in crop yields. So, in 2017, agricultural enterprises increased compared to 2010 the yield of crops of grain and leguminous crops by 65, sugar beets by 72, sunflower by 38, rape by 65%; for households, the corresponding figures were 38, 30, 16 and 36%, respectively. The first place in terms of crop yield is occupied by agricultural holdings. In 2016, the yield in the agricultural holding was: wheat – 51 q / ha, barley – 48 q / ha, corn – 81 q / ha, soybeans – 25 q / ha, rape – 26 q / ha [26].

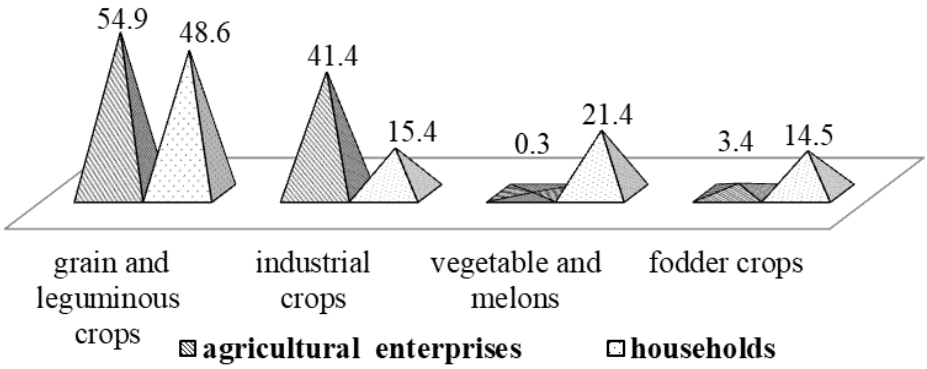

Fig. 4. Dynamics of the structure of cultivated areas of agricultural crops by categories of farms,%

Source: based on data [25].

In table 1 shows the yield in the main categories of farms in Ukraine and some other countries in 2016-2017. The general structure of gross output by categories of farms in 2017 was,%: agricultural enterprises – 56.4 (farms – 15.5, agricultural holdings – 22.0), households – 43.6.

Table 1. Crop yields in the main categories of farms in Ukraine and other countries

Agricultural Crops, q / ha	Ukraine 2016 / 2017			Other Countries 2016 / 2017			
	Agricultural Enterprises	Farms	Households	Austria	France	Germany	USA
Wheat	43,7 / 41,1	42,1/39,8	43,7/40,3	62,5/48,7	53,04/67,6	76,4/76,4	35,4/31,1
Barley	35,2 / 35,0	30,7/30,1	30,1/30,0	61,2/56,3	54,3/63,1	66,9/69,3	41,9/39,1
Corn	72,4 / 55,1	55,4/41,9	46,0/35,0	116,3/99,1	81,6/87,5	96,5/105,3	109,6/110,8
Soybeen	23,4 / 19,7	20,3/17,1	18,3/15,4	30,6/30,0	24,8/29,2	25,6/32,1	35,0/33,0
Rapeseed	25,8 / 27,9	25,4/27,5	22,5/24,3	35,8/28,8	30,5/36,9	34,5/32,6	20,4/17,5

Source: based on data [25].

The structure of crop production by agricultural enterprises is as follows: farms – 18.7%, agricultural holdings – 20.0%. In 2017, the cultivated area of crops of all categories of farms was 27.59 million hectares, including agricultural enterprises – 19.26 million hectares (farms – 4.30 million hectares, agricultural holdings – 5.95 million hectares), households – 8.33 million hectares.

In fig. 5 shows the dynamics of the share of agricultural enterprises in the production of grain (a) and oilseed (b) crops in 2010-2017 [25]. The largest contribution of agricultural enterprises is observed in the production of rapeseed, soybean and sunflower, the smallest - of barley.

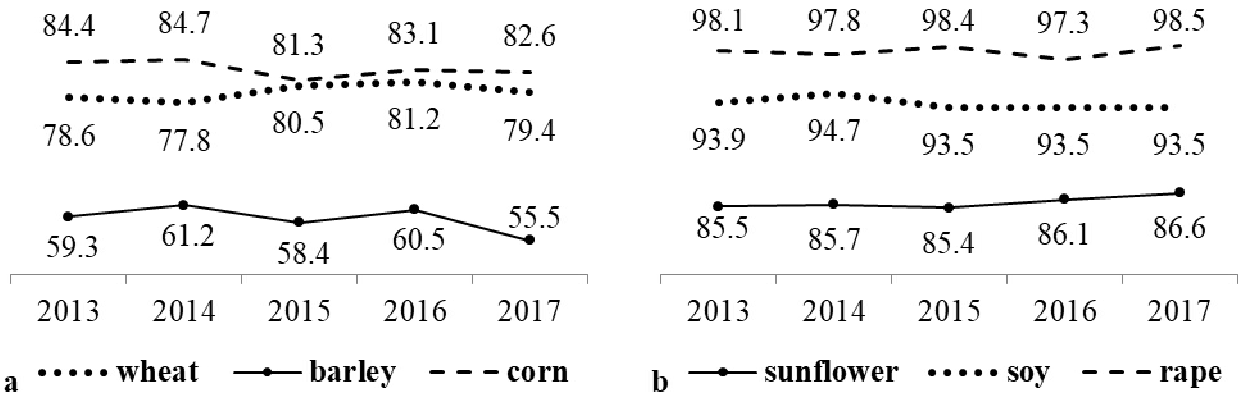

Fig. 5. Dynamics of the share of agricultural enterprises in the production of grain (a) and oilseed (b) crops,%

Source: based on data [25].

In 2017, agricultural enterprises of the Vinnytsia, Cherkas and Kyiv regions made the largest contribution to crop production. For the western and north-western regions of Ukraine (Chernivtsi, Zakarpattia, Ivano-Frankivsk, Volyn, Rivne, Lviv and Zhytomyr regions) contribution to the production of gross output is primarily due to the activities of rural households. For all regions of Ukraine it is characteristic that the share of crop production is more than 50%: from 54.3 in the Ivano-Frankivsk region to 85.8 – in the Luhansk region.

In table 2 and table 3 the production of agricultural crops in the main categories of farms and agricultural holdings is shown. Households are leaders in the production of potatoes, vegetables and fruits, agricultural enterprises – grain and leguminous crops, sugar beet, sunflower, soybeans and rapeseed. Compared to 2016, the contribution of agricultural enterprises increased in the production of vegetables, sunflower and sugar beet. The main reason for the decline in yield in 2017 was the strong heat in the summer. Agricultural holdings play a significant role in forming exports of grains and oilseeds.

Table 2. Volumes of Crop Production by Main Categories of Farms

Agricultural Crops, thousand tons	Agricultural Enterprises / farms		Households		Share of Agricultural Enterprises,%	
	2017	% till 2016	2017	% till 2016	2017	% till 2016
Cereal and Leguminous	47905,1/8686,4	92,1/97,8	14011,6	99,6	77,4	98,3
Sunflower	10596,7/2365,3	90,3/89,4	1638,8	86,4	86,6	100,6
Sugar beet	14227,2/1105,0	106,6/113,5	654,4	98,7	95,6	100,3
Potato	429,4/107,4	91,7/89,0	21778,8	102,3	1,9	86,4
Vegetables	1343,9/272,1	101,6/91,2	7942,4	98,2	14,5	102,8
Fruits and Berries	333,8/75,5	90,1/79,1	1714,2	104,7	16,3	88,1

Source: based on data [25].

Table 3. Volumes of Crop Production by Agroholdings

Agricultural Crops, million tons	Production		Share in Total Production,%		Share in Total Exports,%
	2017	% till 2016	2016	2017	
Wheat	6,1	89,8	26,3	23,3	37
Barley	0,8	83,9	10,1	9,5	27
Corn	9,4	79,7	41,9	37,6	45
Soybean	1,4	87,0	37,2	35,9	28
Rapeseed	0,7	233,0	27,3	31,8	41
Sunflower	2,8	87,5	23,5	22,5	–

Source: based on data [26].

According to the researches at present there is a polarization of agricultural production in the agricultural sector: small-scale forms of management dominate in the production of labor-intensive and low-income products, while the products of large enterprises are highly profitable and have low labor intensity. Agricultural holdings produce mainly highly profitable cereals and industrial crops; such specialization significantly reduces the level of employment of the rural population.

In recent years, Ukrainian farmers have gradually increased the area cultivated for sunflower. Attention to it is due to the high profitability of production; in 2017 the most profitable was the cultivation of sunflower seeds – 41.3%. The contribution of agricultural enterprises in the total production of sunflower in 2010-2017 ranged from 82 to 87%. In 2017, the total sunflower production amounted to 12.2 million tons; the share of agricultural enterprises was 86.6% (of which 22.3% were farms, 22.5%

were agroholdings), and households – 13.4%. The growth rate of sunflower cultivation in agricultural enterprises is significantly higher than in households. Thus, in 2017 its production by agricultural enterprises increased by 89% compared with 2010, by households – by 33% [27]. The highest yield of sunflower was achieved in 2016, q / ha: in agricultural enterprises – 23.5, agricultural holdings – 24.7, households – 17.2; in 2017, these figures were 21.3, 24.0 and 15.2 q / ha, respectively. For comparison, in Fig. 6 the yield of sunflower in some countries in 2016-2017 is shown.

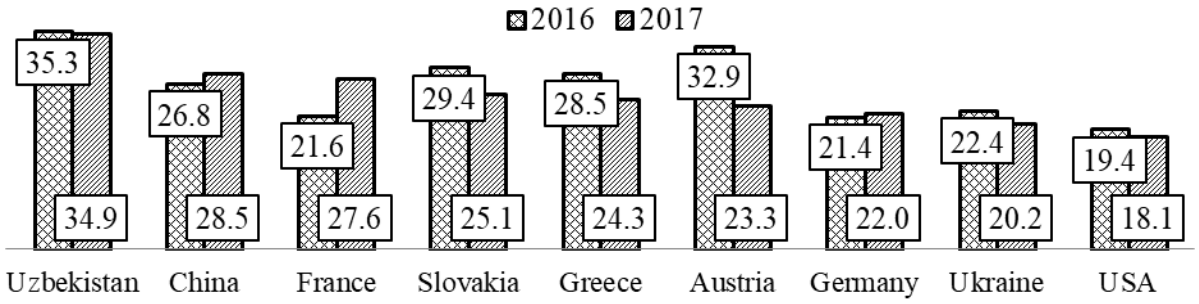

Fig. 6. The Yield of Sunflower in the World, q / ha

Source: based on data [28].

Almost all sunflower remains for processing in Ukraine, and sunflower oil is exported to more than 120 countries of the world. The main consumers of Ukrainian sunflower oil in the world market in 2017/2018 is India (44.7%), the EU (26.2%), China (10.1%), Iraq (4.2%). The largest exporter and manufacturer of sunflower oil in Ukraine is the agricultural holding "Kernel"; it accounts about 8% of world production. The holding supplies its products to more than 60 countries of the world. Cargill, a subsidiary of Cargill, one of the world's largest grain traders, ranks second in the ranking of exporters of Ukrainian sunflower oil. Third place is occupied by a subsidiary of the global agricultural market giant Bunge Ltd, Santreyd.

Let's build an econometric model characterizing the dependence of sunflower production (y , thousand tons) on its yield (x_1, q/ha), the average tractor engine power in agricultural enterprises (x_2, kW) and the average wage in agriculture (x_3 , UAH / month) for the basis of statistical data on Ukraine for 15 years in the form of a linear regression:

$$\hat{y} = a_0 + a_1 x_1 + a_2 x_2 + a_3 x_3 \qquad (1)$$

The matrix of paired correlation coefficients of independent variables is as follows:

$$r_{xx} = \begin{pmatrix} 1 & 0{,}901 & 0{,}924 \\ 0{,}901 & 1 & 0{,}983 \\ 0{,}924 & 0{,}983 & 1 \end{pmatrix} \qquad (2)$$

Analyzing the obtained correlation coefficients, it could be concluded that there is a strong linear relationship between the variables x_1, x_2, x_3 . The calculated value of the correlation determinant is close to 0 ($\det r_{xx} = 0{,}005$), so it can be assumed that there is a multicolinearity between the explanatory variables. Criterion value is calculated $\chi^2 = 65{,}12$; the critical value of this criterion for the degree of freedom $\gamma = 3$ and the level of significance $\alpha = 0{,}05$ is $\chi^2(0{,}05;3) = 7{,}81$. Since $\chi^2 > \chi^2(0{,}05;3)$ it can be argued that there is a multicolinearity in the array of explanatory variables. Thus, independent features x_1, x_2, x_3 cannot simultaneously enter an adequate linear econometric model [17]. The multiplicative model of the form $\hat{y} = a_0 x_1^{a_1} x_2^{a_2} x_3^{a_3}$ was also not statistically significant.

Such linear and multiplicative regressions were constructed with rather high levels of significance of the parameters:

1) the dependence of sunflower production (y , thousand tons) on its yield (x_1, q/ha) and the average power of the tractor engine in agricultural enterprises (x_2 kW):

$$\hat{y}_1 = -8500{,}7 + 481{,}3x_1 + 100{,}6x_2; \quad R^2 = 0{,}94; \tag{3}$$

$$\hat{y}_1 = 1{,}21x_1^{1{,}28}x_2^{1{,}17}; \; R^2 = 0{,}98; \tag{4}$$

2) the dependence of sunflower production (y , thousand tons) on its yield (x_1 , q/ ha) and average wages in agriculture (x_3 UAH / month):

$$\hat{y}_2 = -1495{,}5 + 417{,}9x_1 + 1{,}4x_3; \; R^2 = 0{,}98. \tag{5}$$

$$\hat{y}_2 = 83{,}9x_1^{1{,}15}x_3^{0{,}17}; \; R^2 = 0{,}96. \tag{6}$$

The analysis of the obtained equations allows to draw the following conclusions: from the considered independent variables on the production of sunflower the greatest influence forms its yield; sunflower production is elastic in terms of yield and average tractor engine power and inelastic in terms of average wages in agriculture.

In modern economic conditions, an integral element in the functioning of the agrarian sector of the economy is the development of new forms of agro-industrial structures, among which agricultural holdings play a leading role. They provide an increase in the competitiveness of the agricultural sector of the country's economy, an increase in economic efficiency and profitability indicators in the industry. In tab. 4 the largest agroholdings of Ukraine in 2017 are shown.

Table 4. TOP-10 Agroholdings of Ukraine in 2017

Name / Land Bank	Regions of Ukraine	Products / Key Cultures
Ukrlandfarming 570 thousand hectares	22 regions	crop production; dairy and beef livestock; eggs and egg products; sugar production; processing, storage and trade of grain and industrial crops
Kernel 560 thousand hectares	Ternopil, Odessa, Mykolaiv, Kirovograd, Cherkasy, Poltava, Sumy, Chernihiv, Kharkiv, Dnipropetrovsk, Khmelnytsky	the world's largest producer and exporter of sunflower oil - 8% of world production; grain production and exports; exports to more than 60 countries
Agroprosperis Group (New Century Holding) 430 thousand hectares	Sumy, Chernihiv, Kharkiv, Lviv, Poltava, Mikolaiv, Vinnytsia,Chernivtsi , Zhytomyr, Khmelnytsk, Ternopil, Rivne, Volyn	wheat, rapeseed, corn, sunflower, soybean; one of the largest grain producer, exporter and employer of Ukraine
Myronivskyi Khliboprodukt 370 thousand hectares	Sumy, Kyiv, Vinnytsia, Cherkasy, Ternopil, Khmelnytsk, Lviv, Ivano-Frankivsk, Dnipropetrovsk	the production of poultry and the cultivation of corn, sunflower, wheat, barley, soybean and rapeseed; exports to the EU
Astarta–Kyiv 250 thousand hectares	Poltava, Kharkiv, Vinnytsia, Khmelnytsk, Ternopil, Zhytomyr, Chernihiv, Cherkasy	sugar beet; cereals: corn, wheat, barley; soy; dairy and beef livestock
Mriya Agro Holding 165 thousand hectares	Ternopil, Khmelnytsk, Lviv ,Chernivtsi, Ivano-Frankivsk	wheat, rapeseed, corn, sugar beets, potatoes, buckwheat, barley, peas, soybean; exports to more than 20 countries
IMC 137 thousand hectares	Poltava, Chernihiv, Sumy	corn, wheat, sunflower, soybean, potatoes; milk production
Agroton 122 thousand hectares	Luhansk, Kharkiv	winter wheat, sunflower; dairy and beef livestock; food products
AgroGeneration 120 thousand hectares	Lviv, Ternopil, Zhytomyr, Kharkiv, Sumy	winter wheat, sunflower, rapeseed, barley, corn, soybeans, peas
Ukrprominvest-Ahro 116,5 thousand hectares	Vinnytsia, Zhytomyr, Cherkasy, Poltava, Dnipropetrovsk, Kirovogradsk	sugar beet, wheat, soya, corn, sunflower; sugar production, dairy and beef livestock, grain processing

Source: based on data [29].

The land fund of the first five Ukrainian agricultural holdings can be compared with the territory of Slovenia and Israel, and Kernel and UkrLandFarming holdings enter the 20 largest agricultural companies in the world. A significant amount of agroholdings are located in Kyiv (32) Chernihiv (28) and Poltava (26) regions the least number of holdings are located at Zakarpattia (1) Luhansk (5) and Chernivtsi (5) regions - regions occupying the lowest level of the national ranking of crop production [27, 29]. In general, it can be noted that the rating of regions largely depends on the location of large commodity producers.

Agribusiness is one of the most prospective in Ukraine. Agricultural production provides 12.1% of GDP and serves as a source of currency in the country through exports opportunities. Ukraine occupies such places in the world food market: 1 – production of sunflower seeds and sunflower oil, exports of sunflower oil; 3 – exports of honey; 4 – exports of corn and barley; 5 – production of barley and honey; 6 – wheat exports; 7 – corn production [30].

In fig. 7 the places of the main agricultural products in the structure of commodity exports of Ukraine in 2016-2018 are shown.

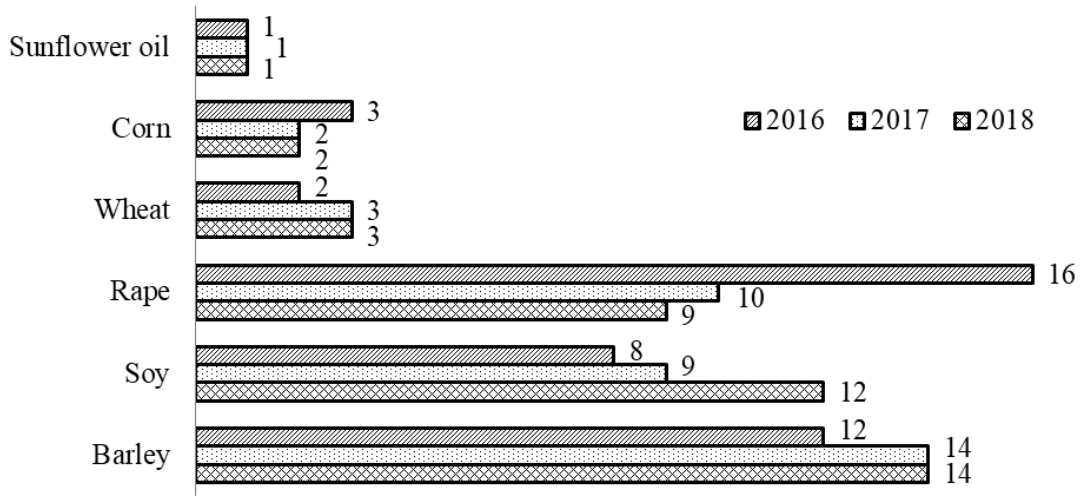

Fig. 7. Places of main agricultural products in the structure of commodity exports of Ukraine
Source: based on data [31].

Table 5 shows the exports performance of the main agricultural products in 2016-2018.

Table 5. Exports of Main Agricultural Products in 2016 – 2018

Product Name of the Commodity	2016			2017			2018		
	Cost, billion dollars USA	Specific weight, %	Weight, million tons	Cost, billion dollars USA	Specific weight, %	Weight, million tons	Cost, billion dollars USA	Specific weight, %	Weight, million tons
Sunflower oil	3,7	10,19	4,8	4,3	9,95	5,8	4,1	8,69	5,6
Corn	2,6	7,30	17,3	3,0	6,91	19,4	3,5	7,41	21,4
Wheat	2,7	7,47	17,9	2,8	6,38	17,3	3,0	6,35	16,4
Rapeseed	0,4	1,08	1,0	0,9	2,04	2,1	1,0	2,14	2,4
Soybean	1,0	2,71	2,7	1,1	2,45	2,9	0,8	1,76	2,2
Barley	0,7	1,83	4,8	0,7	1,64	4,9	0,7	1,44	3,6

Source: based on data [31, 32].

Significant raw material direction of exports production can consolidate the country's position in world food markets as a supplier of agricultural raw materials. A positive example of the transition to the exports of high-tech products is an increase in the production of sunflower oil due to the high profitability of sunflower and exports duties on it.

Due to the processing of cultivated agricultural products of Ukraine, it has the opportunity to significantly strengthen its position in world markets, especially grain, and to improve the economic development indicators [10].

The agricultural sector is one of the most favorable to innovation. Evidence of this is the introduction of new technologies in crop production and livestock production by leading agricultural enterprises of Ukraine. In crop production, the latest technical and technological solutions are associated, for the first hand , with selection work and genetic engineering, organic farming, micro irrigation, space information technology. About 120 scientific institutions that busy in work with more than 300 plant species are engaged in crop breeding in Ukraine. Organic agriculture means the abandonment of the usage of mineral fertilizers and pesticides, as well as the usage of stimulation of the biological activity of the soil. The trend of modern development of agriculture is characterized, in particular, by the creation of conditions for the stable management of the state of the soil. In this aspect, the leading role belongs to irrigation and drainage of land, the usage of which minimizes the dependence of agricultural production on the conditions of natural moisture-providing.

The usage the achievements of the space industry becomes an important condition for improving the efficiency of agricultural production. This is a rather topical issue in modern conditions, since the presence of significant territories of the agrarian sector determines the need for obtaining information about the state of resources, the effective usage of natural resource potential, and yield forecasting. Innovative information systems include Global Positioning System (GPS), "Rapid Eye", CORINE Land Cover (Coordination of Information on the Environment) etc. Scientific and technological progress has stimulated the rapid development of nanotechnology – methods and techniques that guarantee the ability to create and modify objects by a controlled way that have fundamentally new qualities and allow their integration into fully functioning systems. The introduction of innovative technologies in the crop industry creates a positive effect, affecting yield, cost savings, rational usage of resources [33].

Conclusion. The constructed Lorenz curve found out a significant inequality in the distribution of land area by the number of enterprises: 81.5% of enterprises owned 13.4% of the total area. In the agrarian sector of the country, polarization is observed in the manufacturing of products: small-scale forms of management dominate in the production of labor-intensive and low-income goods, and powerful agricultural enterprises are highly profitable and low-labor-intensive. High positions in the structure of commodity export of Ukraine belong to sunflower oil, wheat, corn, barley, rapeseed and soybeans.

Agrarian holdings play a significant role in forming export potential; their high yields are explained by the usage of a wide range of innovative solutions in production. Thanks to the exports of sunflower oil, grains and oilseeds Ukraine receives tangible foreign exchange earnings, and agricultural enterprises receive substantial profits. One of the main priorities of increasing commodity exports in Ukraine should be overcoming the raw material orientation of its agricultural component and increasing the share of high value-added products.

One of the leading places in the crop is the cultivation of sunflower due to its high profitability. The linear and multiplicative regressive dependences of the volume of sunflower production on its yield, the average engine power of the tractor in agricultural enterprises and the average wage in agriculture allowed to determine that out of the considered independent variables its yield produces the greatest impact on the production of sunflower; sunflower production is elastic in terms of yield and average tractor engine power and inelastic in terms of average wages in agriculture.

The effective development of agriculture and the increase in the export potential of Ukraine are impossible without the introduction of new technologies in agricultural manufacturing. This requires powerful channels for the dissemination of knowledge, relevant local services and the belief of farmers in the benefits of innovation. An integral part of the country's European integration process is the creation of state advisory services to support agricultural producers and rural development.

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