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PECULIARITIES OF CATTLE-BREEDING DEVELOPMENT IN STEPPE, WOODED STEPPE AND WOODLAND ZONES IN UKRAINE

The levels of cattle-breeding development in Ukraine and its various zones along with the efficiency indices of this sector are analyzed. The available statistical data show that agricultural companies in the wooded steppe zone have higher indices of the development and efficiency of cattle-breeding. A positive impact of the level of branch intensity on its efficiency indices both on the entire territory of Ukraine and in its separate zones is grounded.

Keywords: *Ukraine; cattle-breeding; steppe; woodland; agricultural company.*

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ОСОБЛИВОСТІ РОЗВИТКУ СКОТАРСТВА В ЗОНАХ СТЕПУ, ЛІСОСТЕПУ І ПОЛІССЯ УКРАЇНІ

У статті проаналізовано стан розвитку та показники ефективності галузі скотарства в Україні та її зонах. З використанням статистичних даних доведено, що вищі показники розвитку й ефективності галузі скотарства мають сільськогосподарські підприємства в зоні лісостепу. Обґрунтовано позитивний вплив рівня інтенсивності галузі на показники її ефективності як у цілому по Україні, так і в її зонах.

Ключові слова: *Україна; скотарство; степ; Полісся; сільськогосподарське підприємство.*
Табл. 2. Рис. 2. Літ. 12.

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ОСОБЕННОСТИ РАЗВИТИЯ СКОТОВОДСТВА В ЗОНАХ СТЕПИ, ЛЕСОСТЕПИ И ПОЛЕСЬЯ УКРАИНЫ

В статье осуществлён анализ состояния развития и показателей эффективности отрасли скотоводства в Украине и её зонах. С использованием статистических данных доказано, что более высокие показатели эффективности отрасли скотоводства имеют сельскохозяйственные предприятия в зоне лесостепи. Обосновано позитивное влияние уровня интенсивности ведения отрасли на показатели её эффективности как в целом по Украине, так и в её зонах.

Ключевые слова: *Украина; скотоводство; степь; Полесье; сельскохозяйственное предприятие.*

Problem statement. The issues related to the state and development tendencies of the cattle-breeding sector are topical for Ukraine not only because of the reduction in total head of cattles, including cows and the amount of products produced by this sector but also because the solution of many problems depends on the development of the agrarian sector, in particular, the problems that refer to social development of rural territories, employment and increasing standards of life. It implies that the stabilization of further development of this sector is a pressing issue for agriculture of Ukraine and its regions, which is reflected in contemporary legislation, and in particular in the Law of Ukraine "On the Region Progress Encouragement" (2005), in the draft Law of Ukraine "The Strategy of the Development of the Agrarian Sector of the Economy of Ukraine for the Period up to 2020" (2014) and in analytical reports of scientists. This problem can successfully be solved under the condition that the specificity of the sector development in agricultural zones of Ukraine and its regions is taken into consideration.

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Latest publications analysis. The issues of cattle-breeding development and the search for the ways out of the complicated situation encountered by the sector over the past few years are often discussed by scientists and practitioners involved in their solution. Numerous scientific papers by both scientists and practitioners consider this matter. Some scientific papers are focused on the analysis of sector development (Diesperov, 2013; Korniychuk, 2013) and some of them strive to explain the ways how to increase the efficiency of its development (Ambrosov, 2012; Kucher, 2013). As a rule, the subject is related to the processes of cattle-breeding development on the entire territory of Ukraine or in its regions. Thus, in many scientific papers the consideration is given to this problem at the regional level (Movchanuk, 2012; Vasyutinska, 2012; Zbarskiy, 2012). However, some aspects of this sector development have not been considered yet.

Unresolved issues. We believe that an important point in the context of this matter consideration is the review of this issue at the level of natural economic zones, because climate conditions play an important role in the formation of conditions development. This research is thus dedicated to the consideration of these important factors.

The research objective is to define the key trends in the development of cattle-breeding in Ukraine; to determine the degree of the manifestation of the mechanisms specific for cattle-breeding in particular natural economic zones in Ukraine; to determine the influence of some individual factors, in particular the level of production intensity on the efficiency of the development of dairy cattle-breeding in Ukraine and its zones.

Key research findings. The level of sector development can be evaluated taking into account such parameters as the total number of cattle, in particular cows, production volumes and the level of productivity.

While analyzing the indices of cattle-breeding development (Agriculture of Ukraine in 2012, 2013) we must first determine the number of companies that produce livestock; this can be one of the indicators of the processes that occur in this sector. Thus, the analysis of agricultural companies, involved in the production and selling of livestock in Ukraine and its natural economic zones throughout the period of 2005 to 2013 showed that their quantity is reducing in general in Ukraine and in all of its zones. Their largest quantity in the absolute expression is observed in the wooded steppe zone. In 2005 the number of companies that produced livestock in that zone was equal to 2504, and in 2013 it reduced to 971. For comparison, the steppe zone had 1256 companies in 2005 and 480 companies in 2013, and in woodlands there were 1506 and 550 companies, accordingly (Form # 50 "Key economic indicators of agricultural enterprises in 2005", 2013) .

The main pattern of change in livestock population, including cows, showed a decrease. The number of livestock population in 2013 was equal to 18.6% of the 1990 level, and that of the cows to 30.5% (Agricultural Ukraine in 2013, 2014). The weight of cows in the total number of livestock has changed considerably. It had a positive tendency of growth from 34.0% in 1990 to 55.0% in 2013 (Agricultural Ukraine in 2013, 2014). However, with regard to natural climate zones these patterns of live weight of the raised livestock and milk production had certain peculiarities.

It should be noted that the highest indices of livestock sector development in natural climate conditions in 2005 and in 2013 belonged to wooded steppe zone. Thus, while raising livestock in 2005 the live weight gain was 40.4% of the total figure for Ukraine, it was lower in wooded steppe (30.0%) and it was the lowest in the steppe zone (29.5%). Over the next years the situation was the same, in particular, in 2013 the live weight gain was 39.0% of the total figure for Ukraine in the wooded steppe zone (Form # 50 "Key economic indicators of agricultural enterprises", 2005; 2013).

As for milk production, the relationship with regard to natural zones was the same. Wooded steppe produced the highest quantity of it. The specific weight of milk produced here throughout the period of 2005 to 2013 varied from 39.8% to 43.0% and in 2013 it was equal to 43.0%. Milk production in wooded steppe had somewhat higher specific weight and in 2013 was equal to 31.4% and in the steppe zone it reached 25.6% (Form # 50 "Key economic indicators of agricultural enterprises", 2005; 2013). Therefore, wooded steppe held and it still continues to hold the key position in livestock production throughout the analyzed period (2005 and 2013).

The next step in the research is the determination of the efficiency level of livestock production in Ukraine in the studied natural economic zones in 2005 and 2013. The appropriate calculations are given in Tables 1 and 2. Table 1 contains the efficiency indices of the live weight of the raised livestock.

Their analysis shows an increase in the efficiency factors of livestock production in 2013 in comparison with 2005. Thus, in 2013 the livestock population per one farm that produced livestock was higher by 131 heads in comparison with 2005, and it was equal to 440 heads. In the wooded steppe zone livestock population also increased from 346 heads to 520 heads in 2013 in comparison with 2005.

A characteristic feature of the live weight gain by livestock is high level of its marketability. It considerably increased in the woodland zone and in 2013 it was equal to 144.0% vs. 122.0% in 2005. The livestock gain value (in live weight) per one farm was on average higher in 2013 in comparison with 2005 and as for Ukrainian zones it was the highest for wooded steppe. The average daily gain in 2013 had a tendency to an increase in comparison with 2005, which is a positive factor.

Such a production efficiency index as profit (or negative profit) value from the sale of livestock gain (in live mass) is indicative of severe unprofitability of production. The comparison results of the studied natural climatic zones showed that wooded steppe had the lowest level of unprofitability. According to the computational data it was equal to 182.3 UAH per 1 center and in 2013 it was equal to 746.1 UAH. At the same time the level of production unprofitability in the woodland zone was a bit lower in comparison with woodlands. The livestock nurture (live mass) in steppe was very unprofitable.

Table 2 gives the efficiency indices of milk production at agricultural companies in Ukraine and in its zones.

The given data on milk production efficiency show their increase in 2013 in comparison with 2005. A positive factor is an increase in cow population on average per one farm in 2013 in comparison with 2005. As for agricultural companies that produced and sold milk this index increased from 169 heads in 2005 to 285 heads in 2013, which is indicative of positive processes in the development of this sector, in particular it shows an increased level of milk production concentration. In the wood-

Table 1. **Development indices and livestock raising efficiency for zonal live weight gain at agricultural companies of Ukraine**

Index	Years							
	2005				2013			
	Ukraine	Steppe	Wooded steppe	Woodlands	Ukraine	Steppe	Wooded steppe	Woodlands
Livestock live mass								
The livestock population (on average per one farm)	309	312	346	243	440	379	520	353
Livestock increase (live mass) (on average per one farm)	411.1	403.9	458.8	335.3	758.0	621.5	937.1	561.0
Marketability level, %	120.0	110.6	123.9	122.0	123.3	121.8	116.9	144.0
Average daily gain, g	365	361	366	366	472	449	493	435
Total cost price per 1 centner, UAH	721.1	771.1	715.5	686.3	1871.5	2113.2	1801.5	1810.7
Selling price per 1 centner, UAH	540.5	523.4	533.2	574.2	1054.9	1059.5	1055. 5	1045.3
Profit (negative profit) per 1 centner, UAH	-180.6	-247.7	-182.3	-112.6	-816.5	1053.8	-746.1	-765.5
Level of profitability, %	-25.0	-32.1	-25.5	-16.4	-43.6	-49.9	-41.4	-42.3

Source: compiled by the author according to the data from Form # 50 «Key economic indicators of agricultural enterprises» (2005; 2013).

Table 2. **Milk production efficiency and development indices for agricultural companies of Ukraine and by its zones**

Index	Years							
	2005				2013			
	Ukraine	Steppe	Wooded steppe	Woodlands	Ukraine	Steppe	Wooded steppe	Woodlands
Cow head (on average for one farm)	169	172	185	139	285	249	329	237
Milk production, centners (on average per one company)	5095.5	5083.4	5946.4	3606.4	758.0	621.5	937.1	561.0
Yield of milk from 1 cow, kg	3016	2959	3221	2595	4888	4446	5430	3893
Total cost price per 1 centner, UAH	92.8	98.9	91.9	83.3	303.9	327.8	302.3	285.6
Selling price per 1 centner, UAH	104.1	104.3	104.9	98.3	345.8	350.4	347.4	335.3
Profit (negative profit) per one head, UAH	340.8	160.8	417.4	388.1	2045.9	1005.4	2448.7	1934.1
Level of profitability, %	12.2	5.5	14.1	18.0	13.8	6.9	14.9	17.4

Source: compiled by the author according to the data from Form # 50 «Key economic indicators of agricultural enterprises» (2005; 2013).

ed steppe zone cow population was the highest both in 2005 and in 2013. Cow population per one farm was on average lower in steppe: 172 and 249 heads in 2005 and 2013, accordingly and it was even lower in woodlands.

The cow productivity index changed the same way, with regard to agricultural companies of Ukraine it increased on average from 3016 kg to 4888 kg. This productivity index was the highest for the wooded steppe zone both in 2005 and in 2013. Note that the milk yield value per one cow reached 5430 kg in 2013. The profit per one cow was also the highest in the wooded steppe zone. In 2013 it was equal to 2448.7 UAH. In the woodland zone it was equal to 1934.1 UAH and for the steppe it was equal to 1005.4.

Trying to find an answer to the question what factors in addition to natural ones influence the discrepancies in efficiency indices of livestock production in Ukrainian zones we analyzed the production intensity level peculiar for them. The cost position per one cow was selected as the indicator that defines the level of production intensity.

The computations showed that the level of costs per one cow (intensity) plays a decisive role in cow productivity in all natural economic zones and in Ukraine on the whole, notably the productivity of cows increased with an increase in the cost value per one cow.

The relationship between the increase in milk production intensity and the index of cost recoupment due to milk sales proceeds was different.

The most notable differences were formed between the character of relationships in 2005 and 2013. Thus, in 2005 an increase in costs resulted also in increased recoupment, which later on decreased. This regularity was the most efficient for Ukraine on the whole, and it was the lowest for the steppe zone. The relationship between the value of costs per one cow and their recoupment due to the receipts from milk sales was formed in a totally different way in 2013 (Figure 1).

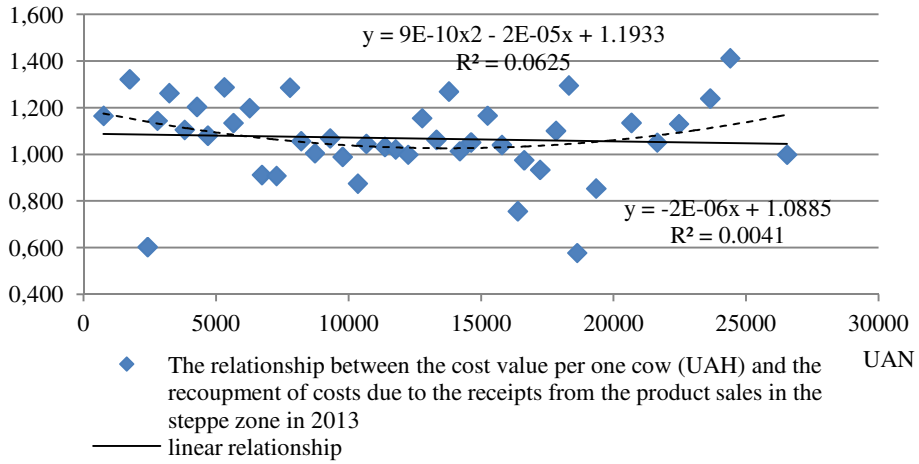

Figure 1. **The relationship between the cost value per one cow, UAH and the cost recoupment from milk sales by agricultural companies of the steppe zone in 2013,** *constructed by the author*

At first, the recoupment somewhat decreased at zone companies as the costs per cow increased, and it reached its minimum value at the costs of 11100 UAH, and then it increased. On the whole, the cost recoupment increased in the zone of maximum costs, as a consequence the deviation of design indices of the recoupment from their actual value during the matching of series using the straight-line equation and parabolic equation of the second order was not very essential. The problem of decrease in cost recoupment as these costs increased after reaching the maximum that appeared in 2005 was actually solved in 2013.

However, the question is whether it is possible to reach an increase in cow production and cost recoupment at the same time while increasing the intensity level of dairy husbandry sector. On the grounds of mass data and grouping data and by establishing the relationship between cow productivity and cost recoupment due to the proceeds from milk sales we established that such opportunity exists. Using the productivity of cows as a factorial index we establish that an increase in cows productivity was accompanied by an increase in the amount of costs per one cow and simultaneous increase in the level of their recoupment both in 2005 and in 2013. Figure 2 gives the relationship data for the year 2013.

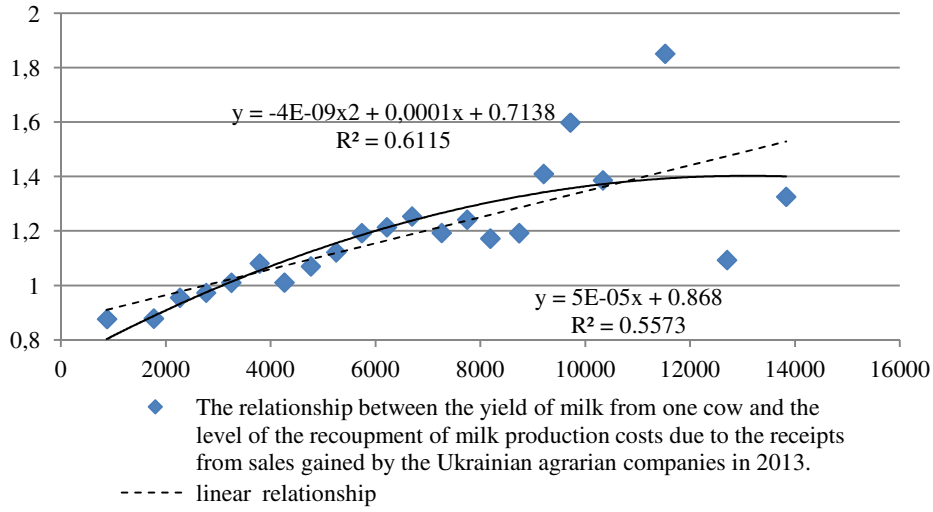

Figure 2. **The relationship between the yield of milk from one cow and the level of recoupment of milk production costs due to the receipts from sales gained by agricultural companies in 2013,** *constructed by the author*

The nature of such a phenomenon implies the realization of the investment and innovation line of development that provides organic combination of investments and innovations.

Conclusions and prospects for future research. The general trend in the development of cattle-breeding in Ukraine and its natural climatic zones is characterized by a decrease in livestock population, including cows, however, there is also a tendency to increase the productivity level. However, these indices have certain peculiarities for

natural climatic zones that are related to the fact that the sector-related situation is less tense in the wooded steppe zone and it is worse in steppe and woodland zones.

The analysis of the efficiency indices of livestock production in Ukrainian zones is indicative of an increase in their level in 2013 in comparison with 2005, which can imply the stabilization in this sector. Higher efficiency indices are peculiar for the wooded steppe zone in comparison with woodlands and steppe.

The livestock development in Ukraine and its zones depends on the level of intensity reflected in such an index as the amount of costs per one cow and is related to the use of investments and innovations in this area.

The research showed that the development prospects of the sector require taking into consideration the significant deviations in livestock production by climate zones in Ukraine.

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