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The Strategies of Grassland Management in Farms of Northeastern Part of Poland

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Abstract: Four directions for grassland management are set out under the Common Agricultural Policy: the existing, environmental, productional and integrated. The aim of this work is to demonstrate the agreement of production potential of grassland with the strategy of the CAP on the background of commodity milk production. This work is connected with randomly selected 1656 farms from the north-eastern part of the Lublin province remaining the dairy cattle. Source material for analysis was derived from the evaluation reports of dairy farms and the datas of Voivodeship Statistical Office. Taken the average annual milk production and surface of permanent grasslands, were divided into three groups of management direction: I- existing, II- integrated, III- productional. In a separate II group of this management, three subgroups were identified dependent on the volume of milk production: A-(20-50), B-(50-100), C-(100-350) thousand of liters. In the studied farms the participation of grasslands in the structure of agriculture farming lands was significantly higher than the average in the region as well as in the country. The largest research group accounted 49.5% of farms producing 20-50 thousand liters of milk with an average area of 21.23 ha and sustained an average of 9.8 cows. Large proportion of permanent grassland in the structure of agricultural lands and large stocking density per 100 ha of grasslands in northeast farms of Lublin province indicate significant intensification of feed production on the farmlands.

Key words: Grassland management, milk production, stocking density.

1. Introduction

In Poland breeding of dairy cattle is one of the main branches of agricultural production. For milk, beef and veal livestock accounts 26% of the final production of our agriculture. Analysis of the agricultural structure of commodity production last years shows the increasing the importance of dairy farming. The increasing importance of milk production on farms last years caused, a relatively stable price, and profitable perspective of this branch. Important position in the income of farmers is the payment for milk, because it is a steady source of cash throughout the whole year. For milk production, to be able to live and to invest we should earn [1]. Cattle as the primary branch of livestock production are closely connected with other branches of agricultural production. Cattle are the primary producer of manure, what favored on light soils is essential to maintain their fertility, by carrying out proper management.

Profitability of milk production by dairy farmers and dairymen depends on herd size, the size and type of production (extensive, intensive), cow milk yield, milk procurement prices [2]. Price of milk is related with its quality and has a decisive influence on the profitability [3], milk production becomes profitable with sales at least 20 thousand liters of milk per year.

In north-eastern part of the Lublin province appears the greater concentration of grasslands and animal production [4, 5].

The natural conditions and a long tradition conducive to the development of cattle farming and economic aspects [6-8] favor the milk production. On the base of this analysis [6, 9, 10] this region has a

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low utilization of the productive potential of agriculture.

Under the Common Agricultural Policy [11] for grassland management are set out four directions: the existing, environmental, productional and integrated. So, the aim of this work is demonstrating the agreement of production potential of grassland in north-eastern part of Lublin province with the strategy of Common Agricultural Policy in regard to milk production.

2. Materials and Methods

This research was carried out on randomly selected 1656 farms from the north-eastern part of Lublin province remaining dairy cattle.

Source material for analysis was derived from the evaluation reports of dairy farms and the datas of Voivodeship Statistical Office. Taken the average annual milk production and surface of permanent grasslands, were divided into three groups of management direction: I- existing, II- integrated, III- productional [12]. In a separate II group of this management were identified three subgroups dependent on the volume of milk production: A-(20-50), B-(50-100), C-(100-350) thousand of liters.

The study area included the following data:

- number of farms,
- education of the farm owner,
- the number of people employed on the farm,
- area of the farm,
- the average balance of cattle,
- the number of posts for cattle,
- ownership of accompanying buildings,
- a type of functional barn,
- owned machinery and equipment,
- production and sale of milk,
- investment needs of farms,
- new investments in farm-related with environmental,
- the state of sanitary - veterinary requirements.

Spreadsheets Microsoft Excel 2000were used during the processing of numerical data.

3. Results and Discussion

The feed production on permanent grasslands should realize the environmental and natural aspect of these communities. Integrated direction of management seems to be a priority, because it combines three main tasks: the production of feed and care about its quality and environmental protection [12]. In the studied farms the part of grassland in the structure of agricultural farming lands was significantly higher than the average in the region as well as in the country. In a separate group of farms with existing direction of the management on permanent grasslands (Table 2) and with the lowest milk production (up to 20 ths.L.) this index amounted 27%, while in farms classified to the “productional” direction producing over 350 thousand of litres was significantly higher (53.4%).

In farms with a large share (over 30%) of permanent grasslands, is still looking for the opportunities of profit increase. So, [10] considers that such an agrarian structure is the basis for directing and even specialization in commercial production of milk. In the analyzed material (Table 1), the largest group (49.5%) stated the farms producing 20-50 thousand

Table 1 Characteristics of study material.

Specification	Management direction on grasslands				
	Existing	Integrated			Productional
		A	B	C	
Number of farms	462	819	304	70	1
Part of farms in group (%)	24.9	49.5	18.4	4.2	0.1
Mean annual milk production (ths.L)	to 20	20-50	50-100	100-350	over 350
Mean farm surface (ha)	18.77	22.6	29.5	56.14	77.0

liters of milk with an average 9.8 number of cows. The present group of farms was characterized with a larger surface of the farmland in compare to the average of province (6.9 ha) and Poland (8.4 ha). This is confirmed [9], that the northern part of Lublin region is characterized with a higher share of larger farms with a significant share of permanent grassland and with a greater concentration of livestock production. The largest average stocking density of cattle (Table 2) per 100 ha of agricultural farming lands (over 105 DJP) have been reported for farms producing more than 50 thousand liters of milk per annum and sustained more than 30 numbers of cattle. In these farms we can observe a much higher stocking on 100 ha of permanent grasslands, what undoubtedly forced the farmers to eliminate irregularities in the management of the farmland. The standard in increasing of quality and quantity of feed was the appropriate utilization, fertilization, mechanization and maintenance of drainage equipment. In each direction of the grassland management the most important pratotechnical element is fertilization. Annual production of nitrogen (Table 3) in natural fertilizers clearly shows that all examined farms don't exceed the total nitrogen 170 kg of N per 1 ha of farmlands. This was confirmed [13], that milk production even in normal farms as well as in family farms is the most sustainable form of animal production. In the examined farms the stocking density per hectare of agricultural land doesn't exceed a specified limit of 1.9 DJP. It shows that even high commodity milk production based on a large share of fodder from permanent grassland is production as environmentally friendly.

In the majority, the farms with a smaller scale of milk production do not have modern and large barns (Table 4). However, their technical conditions are most satisfactory. Position for the cows in these farms are almost fully utilized what it does not give a major possibilities for increasing of cattle population and

Table 2 Indexes for study farms in regard to province and country.

Specification	Management direction on grasslands					Mean for:	
	Existing	Integrated			Productional	Lublin province	Country
		A	B	C			
Mean farmland surface (ha)	17.47	21.23	27.83	53.95	72	6.9	8.4
Part of grassland in farmlands (%)	27.0	32.4	39.1	35.8	53.4	16.4	20.1
Stocking cattle (DJP) cows (no)	7.7	15.0	30.1	57.3	75.9	2.7	4.3
	4.7	9.8	19.0	35.5	70	2.5	3.9
Stocking density (DJP) per 100 ha of grasslands of farmlands	160	220	280	300	200	158	155
	40	70	108	106	105	33.7	41.0
Number of employers per 100 ha of farmlands	11.1	9.23	7.55	4.28	3.47	19.0	12.9

Table 3 Characteristics of animal maintenance and production of manure.

Specification	Management direction on grasslands				
	Existing	Integrated			Productional
		A	B	C	
Functional type of barn (no):					
without mulching	3	16	18	12	x
with mulching	167	597	276	58	1
deep bedding	263	210	11	2	x
Nitrogen production in natural fertilizers (kg/ha of farmlands):					
manure	36.05	49.6	62.09	55.14	62.2
slurry	0.25	1.21	5.7	15.9	x
urine	32.6	10.54	20.09	18.1	21.6
Total	68.9	61.4	87.9	89.14	83.8

milk production. Farms belonging to the group with a large-scale of milk production have bigger dairy barns are and more modern with a much larger number of positions for the cows (Table 4). They are characterized by a much greater ability to increase the herd of cattle and milk production, because the use of these positions is not optimal. These barns are in good and very good condition.

A large number of these farms had tanks for liquid manure (Table 5). While the slurry tanks in the study farms is not to much that can be associated with functional types of barns. But the supporting buildings such as dunging gutter and ensilage silo largely have the farms with high milk production.

Production and sale of milk in farms with a small area of grassland and with a small herd of cattle was small, and there the produced milk predominantly was low and lowest quality (Table 6). The situation is different in farms with more grassland and high milk production. The farmers produced where raw material, in the majority, reaches the highest quality and standards.

Table 4 The number of places for cows in regard to annual milk sale.

Specification	Managament direction on grasslands									
	Existing		Integrated						Productional	
			A		B		C			
	Total	Mean /farm	Total	Mean /farm	Total	Mean /farm	Total	Mean /farm	Total	Mean /farm
Number of places for cows	4246	9.2	11800	14.4	74.35	24.5	3555	47.9	70	70
	No of farms	%	No of farms	%	No of farms	%	No of farms	%	No of farms	%
State of barn:										
very well	31	6.7	85	10.4	73	24.0	30	42.9	0	0.0
well	335	72.5	628	76.7	217	71.4	38	54.3	1	100
satisfactory	89	19.3	104	12.7	14	4.6	2	2.9	0	0.0
bad	0	0.0	0	0.0	5	1.6	3	4.3	0	0.0
Utilization of cow places		51.6		68		77.6		74.1		100

Table 5 The number of farms with accompanying buildings in depend on the annual milk sale.

Kind of buildings	Managament direction on grasslands									
	Existing		Integrated						Productional	
			A		B		C			
	No of farms	%	No of farms	%	No of farms	%	No of farms	%	No of farms	%
Liquid dung pit	213	46.1	560	68.4	273	89.8	63	90.0	1	100
Slurry pit	12	2.6	52	6.3	48	15.8	16	22.9	0	0.0
Dung pit	23	5.0	207	25.3	170	55.9	53	75.7	1	100
Silo	20	4.3	61	7.4	55	18.1	25	35.7	0	0

Table 6 Fulfilling of the sanitary and veterinary requirement by the farms in regard to the annual milk sale.

Specification	Managament direction on grasslands									
	Existing		Integrated						Productional	
			A		B		C			
	No of farms	%	No of farms	%	No of farms	%	No of farms	%	No of farms	%
Have sanitary–veterinary certificate	1	0.2	75	9.2	174	57.2	60	85.7	1	100.0
Fulfil sanitary–veterinary requirement	3	0.6	28	3.4	6	2.0	0	0.0	0	0.0
Not fluffed sanitary–veterinary requirement in the coming years	236	51.1	100	12.2	3	1.0	0	0.0	0	0.0

Most farmers are aware of environmental hazards which resulted from inappropriate and inefficient management with by-products of animal production and they see the meaning, need and great value in the fact that Polish farms meet all environmental standards.

Farmers with large scale production of milk in a large number have been approved sanitary-veterinary requirement (Table 6), while farms with a small area of grassland and not high milk production only a few have certificates.

4. Conclusion

The huge number of farms was characterized by small scale of milk production, and production in these farms is multi directional, which does not increase and improve the quality of produced milk.

Large share of permanent grassland in the structure of agricultural land and large stocking per 100 ha of permanent grassland indicates a significant intensification of feed production on the farmland.

Milk production was profitable in farms which had suitable surface of grasslands and had the modern machines park and equipments for production and storage of milk.

Concentration of milk production has influence on the structure of the area of permanent grassland, and their participation in the forage area.

In recent years a change in direction of grasslands management has been observed from the "existing category" towards the "integrated category".

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