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## TECHNOLOGICAL CHANGES IN CATTLE BREEDING AND MILK PRODUCTION IN SELECTED SPECIALISTIC FARMS IN 1995-2008

*Technological changes in cattle breeding and milk production in 10 specialistic farms between 1995 and 2008 were analysed. The average farm area increased from 23.5 to 52 ha (average increase was 28.5 ha – 121%) in the tested period. The number of tenant farmers increased from 4 to 10, and there was a considerable increase in tenanted farm area from 3.9 to 19.4 ha (which made 37% of farm area). Cow herd size increased from 11 to 40 cows (increase by 263%) during the period of 13 years, and milk yield increased from 4783 kg to 6830 kg (increase by 70%). The reason why the milk yield increased, apart from genetic improvement in herds, was applying feeding standards and balanced rations in relation to energy and protein. The average area of corn cultivation increased from 0.12 to 8.52 ha (708%) in the period, and average area of grassland assigned for hay silage increased from 1.1 to 23 ha.*

**Key words:** dairy cattle, management systems, feed production

**Introduction.** Dairy cattle breeding is directly connected with farm areas and farm workforce, which make limits to the production development. Obtaining and keeping high milk yield demand application of proper feeding systems together with estimation of feeding value. Average and large dairy herds have passed through dynamic development of milk production in the last years. Despite the fact that cow population has decreased, milk purchase is going up slowly but systematically, while the number of suppliers is declining. It shows the development of dairy farms, in which productive efficiency has increased and costs have dropped owing to concentration of the production and application of different new technologies in dairy cattle husbandry, which are adapted to UE demands [10,11,15,16].

Hunting for efficiency seems to be a thing of the past. The main problem, which most cow breeders face, is to ensure that genetic potential will afford possibilities for long-lasting and high milk production, proper reproductive rate and animal health. Introduction of new technologies in management systems and in milk production has favourably influenced cow condition. Therefore, it could be concluded: the better for animals – the better for economy [12, 13, 14].

The aim of the paper was to analyse technological changes in cattle breeding and milk production in selected specialistic farms in Siedlce district between 1995 and 2008.

**Material and methods.** Material was collected in farms specializing in cattle breeding and milk production, which were located in Siedlce district in 1995-2008. Data

came from 10 farms, which kept dairy cattle of Black-and-White breed with different content of hf genes.

In the farms the average number of cows in 2008 amounted to 40, and average annual milk yield per cow reached 6830 kg. The material was collected using questionnaires, which contained information such as farm area, tenanted farm area, grassland area, ways of feed conservation, number of cows, milk yield, characterization of cowsheds and ways of milk production in the tested period.

Data of milk yield were collected from reports RW-1 Polish Federation of Cattle Breeders and Milk Producers.

**Results and discussion.** Technological changes in cattle breeding and milk production in 10 specialistic farms in 1995-2008 were analysed. The most important data relative to the farms were presented in graphs 1 to 6. An increase in farm area was noticed during the period. The average farm area in 1995 amounted to 23.6 ha and a considerable part of the area belonged to farmers. The average farm area in 2008 was 51.98 ha and therefore the average increase in the area amounted to 28.5 ha (121%) [figure 1].

The number of tenant farmers increased from 4 to 10, and tenanted farm area also increased from 3.9 to 19.4 ha, which made 37% of farm area [figure 2]. Breeders are worried because of the impossibility to enlarge their farms by purchasing land. Direct surcharges caused that land owners were not interested in selling, but only in leasing. The breeders thought that it unfavourably affected economy of milk production [5, 8, 9].

In the period tested an increase in permanent grassland area from 10.3 ha in 1995 to 24.6 ha in 2008 was found [figure 3].

Introduction of such technologies as grass conservation for clamp hay silage was noticed in 1995. In 1998 hay silage was prepared in all farms as a consequence of appearing technological innovations in grass conservation. Hay balers and round balers were introduced in 1998-2000. Clamp hay silage was prepared only in one farm in 2008. A considerable increase in corn cultivation for silage has been proved since 1998. The average area of corn cultivation has increased by 708% until 2008 and the average area amounted to 8.5 ha [figure 4].

A regular increase in cow herd, from 11.2 cows in 1995 to 40 cows in 2008 was found [figure 5].

A considerable increase in milk yield was also stated from 4783 kg in 1995 to 6830 kg in 2008. Consequently, the growth by 2047 kg (70%) was noticed [figure 6]. The largest increase in milk yield was found in 1998, which was undeniably connected with feeding because the cultivation area for silage considerably increased in the year. Therefore, improvement of genetic value in herds, applying feeding standards and balanced rations, which contained mixtures produced in individual capacity, were the reasons why the milk yield increased in 1998. [6, 7].

Regular introduction of modern technologies into cow management and milk production was noticed between 1995 and 2008. Short stanchion barns were used in 6 farms in 2008, and raised feeding places were applied in 5 of the farms, which gave much more facilities for feeding and keeping feeding hygiene. Loose vehicular barns were used in the remaining 4 farms. In the tested period 7 farmers modernized their cowsheds, whereas 3 farmers built new objects [1, 5].

Direct to can milking machines with 3 or 4 cans have been found in most farms until 2001. Breeders in two farms, in which loose barns were used, have built "side to side" milking parlour for 5 stanchions since 2001, and in the next years they modernized them for 9 stanchions. Milking lasted about 30 minutes in milking parlour for 46 cows. At present calf rearing in loose barns is realized by all farmers, and 6 farms also had loose barns for heifers [2, 3, 4].

Modernized and new cowsheds secure good management conditions for animals.

**Conclusions.** Taking all into consideration, it was found that there were important changes in the tested milk farms between 1995 and 2008, which enabled farmers to achieve better production, and there were used modern technologies in cattle breeding, which resulted in a considerable increase in milk production.

After filling the questionnaires, conclusions relative to current actions and problems connected with the production were drawn as follows:

- The aim of breeders should be to reach milk yield at the level 7000-7500 kg
- Milk recording should be conducted in all farms (at present 7 farms are conducting the cow testing)
- Breeders should aim at using loose barns in cattle management
- The area of own land did not increase as considerably as tenanted land in the tested farms. Generally, the land was leased as a result of agreements between neighbouring farmers. Conversations with breeders explicitly showed that they were willing to buy land, however, direct surcharge system caused that the owners are not interested in selling their land. Breeders reluctantly invested in tenanted land, therefore there were worse crops from the land. At present, land turnover by changing the owner does not exist in the region.
- Plot division and multiplicity of plots in one farm, to some extent, influenced the production and caused higher costs (journey to plots), and therefore worsening the farm income
- Integration of the plots into a whole will be indispensable in order to improve economy in the farms.

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#### Summary

*The aim of the research was to analyse changes in cattle breeding technologies and milk production in farms located in Siedlce district of Mazovia province in 1995-2008. The data for the analyses were collected using questionnaires, which included farm areas, tenanted farm area, grassland area, ways of feed conservation, number of cows in farms and their milk yield, as well as some characteristics of cowsheds in the tested period.*

*It was concluded that the average farm area increased from 23.5 to 52 ha (by 121%) between 1995 and 2008. The number of farmers who held their land on lease increased from 4 to 10, the tenanted area also went up from 3.9 to 19.4 ha (it made 37% of farm area). The average area of corn cultivation for silage increased from 0.12 to 8.52 ha (by 708%), and the average grassland area increased from 1.1. to 23 ha (for hay silage). The herd size increased from 11 to 40 cows (by 263%), and milk yield increased from 4783 to 6830 kg (by 70%).*

*In the tested farms the area of own land did not enlarge as considerably as the land, which was tenanted in different forms. Generally, the land was leased by agreements between neighbouring farmers. Questionnaires explicitly showed that breeders would be willing to buy some ground, however, the system of direct surcharges to agricultural arable land caused that the owners were not interested in selling their land. Breeders did not want to invest in tenanted area and as a result the land brought worse crops. At present in the tested region the land turnover by changing owners does not exist. The division of plots and their multiplicity in each farm, to some extent, influenced the worsening of milk production, and caused the cost rise (journey to plots) and consequently it decreased farm income.*