A MOBILE SYSTEM FOR GRAZING-BASED MILK PRODUCTION

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ABSTRACT

Hungary is located in Central-Europe in the continental climate zone. Average annual precipitation is 580 mm wich makes the climate quite arid. Distribution of precipitation is not even neither from geographic nor from chronologic aspects. This latter fact led to the present production structure being different from region to region within the country. Green yields of pastures show a different pattern during the vegetation period.

Main features and advantages of technology developed by PAU team for grazing-based utilization of river valleys are the following:

- *grass yield is converted into marcetable product;*
- *milk production is based on intesively farmed grasslands;*
- *annual bulk feed (hay, haylage, silage and green feed) consumption is covered by grassland yield;*
- *mobile milking, drinking hay- and concentrate feeding;*
- *handable units of 120-150 cows;*
- *seasonal calving in February, March and April;*
- *artificial insemination;*
- *round the clock grazing for 6-7 months;*
- *using intesive milk type breeds;*
- *closed, deep litter, loose keeping in winter;*
- *low investments, high revenues.*

BACKGROUNDS

Different regions of the country offer different climatic conditions for crop production. Number and yield of crops being suitable in a region are effected by the climatic and soil conditions as well as the surface characteristics. Geographical structure of crop production is determined mainly by the latter factors. In the first half of the century in certain parts of Transdanubia (counties Győr-Moson-Sopron, Vas, Zala, Tolna), as a result of production differentiating effect of tradition and experiences, high level of breeding activity could be found beside keeping large number of animals.

PROBLEMS OF GRASSLAND UTILIZATION

Grasslands are still unexploited reserves of Hungarian agro-ecological potential. Only 40-50% of as much as 1.3 million hectares of grassland is used. Large areas are declared to be 'soil potection' grasslands. Potential productivity is used only in 50% hence the yields can be doubled. On the long run animal keeping ability of grasslands can even be tripled.

Utilization of grass yield assumes special technologies. Best part of Hungarian grasslands are located in river valleys and even the plain grasslands are usually in flood areas beside channels.

The technology developed by PAU team can be used in regions with suitable grasslands and arditions in cattle keeping. Mainly in those regions of Transdanubia where annual precipitation reaches or exceeds 700 mm.

Main characteristics of Transdanubian grasslands are that they spread long in valleys, usually both vertically and horizontally splitted, therefore no large plots can be formed. Generally they are far (2-8 km) from the farm center.

Yield capacity of grass plots of a farm can remarkably differ from each other, becauseof the differences between „soil protecting" grass on slopes and the high yield areas (4-6 t/ha hay equivalent) in the bottom of the valleys. In the latter case, howver, often moors can be found and those can be cultured only after melioration.

By applying the referred technology some 190 thousand hectares of grassland could be used for milk production. It means that 230 thousand cows could be kept on pastures. Simoultaneously 1 ha of ploughland per cow could be allocated for growing wheat and other industrial crops.

This way the profitability of grassland involved into milk production on farms with restricted resources could be made as high as that of the arable plots on farms working within better conditions.

PROBLEMS OF PRODUCTION ORGANIZATION

Due to the former (and practically present) dispersity of concentrated animal keeping (500-1200 cows per farm) the following problems occured: infertility, metabolic diseases, unbalanced nutrition, high energy consumption, stressed concentrate feedng, lack of individual care, leg problems, high culling rate.

All these problems had their share in reducing productivity, raising costs, therefore profitability severely dropped. beside the technological problems mentioned above also a series of economic problems occured, e.g.:

- closed milk producing system failed to match with the general conditions of farms
- grazing was impossible for the huge stocks, hence unexploitment rate of grasslands increased.

Due to economic problems grasslands were totally or partially set aside, so their exploitment rate and their profit capacity decreased and the area of highly profitable crops also reduced.

In being able to get rid of these technological and economic problems an urgent need showed up for a new milk production technology that is free of the mentioned problems.

DISCUSSION

A research team at Pannon Agricultural University, Faculty of Animal Science developed and tested a technology for grazing-based milk production aiming profitable exploitation of splitted grasslands in river valleys. Main features of technology are as follows.

Basic concept of the technology is mobility, seasonality and the organization of closed production units. Mobility means that milking is carried out by applying mobile milking stands at the edge of the grazed plot when the stock is on the long spreading grasslands.

Cows spend 180-200 days on the pastures even during the nights closed up by electronic fences. They can graze at any time, their rhytm is controlled only by themselves. Beside the mobile milking stand, also the water supplyers, the feeders and the mineral dispensers are mobile ones. Mobility allows the herd to be put on far plots since the cows need not be driven up to the milking parlour twice a day. Yield of Hungarian grasslands is seasonal. Peaks occur in May and June followed by a stepwise reduction. Therefore calving is also seasonal, generally it spreads over February and March. Hence peak lactation and peak grass yield are in synchronous connection. Seasonal calving is also advantegous from the aspect of mobility because by the beginning of grazing season the cows are calved, so long distances do not mean

problems, it is not necessary to control the calving and there is no need for transporting the calves. Insemination happens in the mobile milking stands during the first two months of the grazing season.

Third and very important element of the technology is the organization of closed production units. A unit contains 120-150 ha of grassland (with 5-6 tons of hay yield), 120-150 Holstein Friesian cows, a mobile, 24 stands milking device and its accessories, a tractor, the necessary lmanpower (5-7 workers) and a 120-150 capacity winter shed. This unit cannot be splitted. In case of bigger area more units have to be organized.

From organizational and economic aspects the presence of closed units is unavoidable since the mobility itself requires it. Within a small unit the workers 'get personally acquainted' with the animals. In case of bigger units, the organization of grazing would raise several problems.

One unit is already profitable. It can create the financial base for organizing other units. It is important from economic aspect because the system includes the possibility for stepwise development. Setting up a (first) unit does not require tremendous investment.

Winter sheds are closed, deep litter and teh animals are kept loose. Calving occurs in small groups. Young calves have a 5 day free access to milk, later they are kept in small groups and fed by milk substitutes. Covered and closed shed is important since before (February-April) and after (November-December) the grazing season the milking by mobile equipment takes place in them in being able to avoid freezing.

Feeding is based on the grass yield. Basic feed during summer is the grazed grass (40-60 kg per cow) and grass hay (3 kg/cow). Concentrate is fed individually in the mobile milking stand. Hybar, if inserted into cropping rotation, can provide the necessary green feed requirement during an eventual draughty period in August. Winter forage is mainly (90%) harvested from the grassland and offered in the form of hay, haylage and silage.

The special milk production technology for river valleys has proven that profitable utilization of areas with restricted capacities is possible if grasslands are used for milk production.

When introducing the technology one year of pilot period has to be counted. Most important is the grassland management prior to the herd is driven to its area which has

to be enough big to keep 120-150 animals. Fertilizers have to be applied if a green yield of 24 tons per hectare is to be reached.

The technology saves energy and protects the environment. Energy consumption is significantly lower than that of a concentrated dairy farm. Manure fails to endanger the surrounding environment since no sewage is produced. Winter manure is less in quantity and can be handled in a more efficient way.

The system is suitable for producing 'organic milk' because the cows are not calving after they were driven to the pastures, so there is no need for applying antibiotica or other medicaments. There are no chemical residues in the milk. Since no silage is fed in the grazing season the pH value of the milk is optimal, bestly fit for cheese production. Even the flavour of the milk is ideal because of the large number of grass species the cows have grazed.

CONCLUSIONS

The milk production technology for river valley grasslands is a good example how to exploit the grasslands in a way to produce profit by reasonable investment, while the possibility for further development is also maintained.

On the basis of test results it can be concluded that by using the technology described above, if compared to a concentrated dairy farm, a cost reduction of 15-20% can be achieved. By taking the natural conditions into consideration while organizing the production the chances of profitable operation can be increased.

Within adequately stabile economic environment the comparative advantages can be realized ensuring a long term, profitable, competitive milk production for agricultural entrepreneurs.

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