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CONDITIONS FOR KEEPING AND FEEDING COWS IN NORWAY

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Animal husbandry is the second most important segment of the agricultural sector in Ukraine. In the total volume of gross agricultural output, the share of livestock products is 29.7%. The structure of livestock production is dominated by the breeding of livestock and poultry, as well as the production of milk. Along with this, production growth is limited. Therefore, the issue of studying the experience of animal husbandry in Norway is relevant.

Norway is a Northern European country on the Scandinavian Peninsula, with a total area of 385.25 thousand km² (69th place in the world). Norway borders three other countries: Sweden (1,666 km long) to the East, Finland (709 km) and the Russian Federation (191 km) to the northeast. The total length of the state border is 2566 km.

The country's agriculture largely meets the population's food needs, although only 3.5% of Norway's land area is suitable for cultivation. The basis of Norwegian agriculture is animal husbandry, which fully covers the needs of the country's population in meat, milk and dairy products. Due to climatic features, grain production only meets the needs of the domestic market by 40 %. Despite the difficult conditions of the Northern country, a significant part of vegetables and fruits is grown. Only 2.6% of the country's land area is under arable land, and just under 4% is used together with natural meadows.

The main direction of agriculture in Norway is dairy farming. It provides up to 80% of all income from agriculture. Pig and sheep farming are less important than cattle breeding. An important branch of agriculture is fur farming. The main part of agricultural products - root crops, fodder grain, hay is used for livestock feed. Almost two-thirds of the cultivated land is occupied under cultivated meadows. About a quarter of the arable land is under grain, mainly under barley and oats. Crops of rye and spring wheat are insignificant, and therefore more than half of the food grain is imported.

Animal husbandry forms the basis of rural production. There are 1.3 million cattle, 800,000 pigs, and 2.3 million sheep in the country. Approximately 50% of cattle are dairy cows, whose milk yield reaches 1.8 million tons of milk. Dairy and meat farming prevails in the southern part of the country. In the mountainous areas of Central Norway, sheep farming is developed, and in Northern Norway – reindeer husbandry.

Dairy farming accounts for 35% of all income. There are about 30 thousand specialized dairy farms in the country. As in the European Union, Norway has a system of milk quotas. Their value depends on the area of the farm (0.4 ha of farmland per cow or other head of livestock kept on the farm). The quota not only regulates milk production, but also helps protect the environment by preventing pus and urea contamination.

Cooperation between farmers and the state is regulated by annual Agricultural agreements, in which the government partners are the Norwegian Union of farmers and small landowners (apx. 7 thousand members) and Associations of small farmers and hired workers (apx. 14 thousand members). These organizations maintain close contacts with 16 national cooperative organizations of the processing industry, which also include farmers.

The basis of agriculture in Norway is small farms that are scattered, usually at large distances from each other. Many farmers earn their main income from fishing and forest sales. If a farmer is engaged in various types of activities, then his farm is called a holding. In 2017, the average size of agricultural land in the holding was 20 hectares, and this is despite the fact that the country has intensified the process of concentration.

By Ukrainian standards, all Norwegian dairy farms are small: the average number of dairy herds is 23 cows. There are 233,500 dairy cows in Norway.

Farms with 30 or more cows in Norway 41.4%. Until 2010, the local government generally designed and implemented 90% of farm projects. Although in the late 90's in the Kingdom of Norway, there was no investments in agriculture. And the government began to send its farmers on excursions to the EU to study the experience and implement the best practices on its territory. And so gradually, investments began to flow into the agriculture of the Scandinavian state. But even without them, the state helps its farmers: if a farmer wants to build an agricultural facility, he can get up to 30% of subsidies. The milk producer also receives subsidies for every liter of milk supplied and for every tenth part of the processed hectare of land. But here there is a differentiation: the further North you are, the higher the subsidy under harsh conditions. Subsidies are mainly received by small farms (if the owner has less than 50 heads). There is also a state program, according to which the farmer is even provided with money to hire labor. Moreover, if a farmer becomes ill, they are provided with hired labor. It is at the expense of farmers that Norway is provided with 100% milk. With meat production is more difficult, because there are strict restrictions and quotas for such production. Moreover, their value is related to the area of land. There are many milk producers in Norway. But this problem is solved by cooperative associations that guarantee uninterrupted supply of high-quality products.

The company "Lian 49" is located at the address 7255 Sundlandet. The company is owned by Jon Lian.

From June to November, the animals are out for walking, for this purpose the entire territory is fenced with electric shepherds. Milking cows are kept loose in the premises of the farms. Meat livestock is kept outside in special houses all year round.

The milking process is performed using Lely milking robots. The Lely principle for all products is minimal energy consumption. Research conducted by Dansk Landbrugsredgivning shows that the Lely Astronaut system uses less energy and water than any other competitor. In addition, the long service life, maintainability and suitability for modernization of the Lely Astronaut robotic milking system guarantees a return on investment (fig. 1).

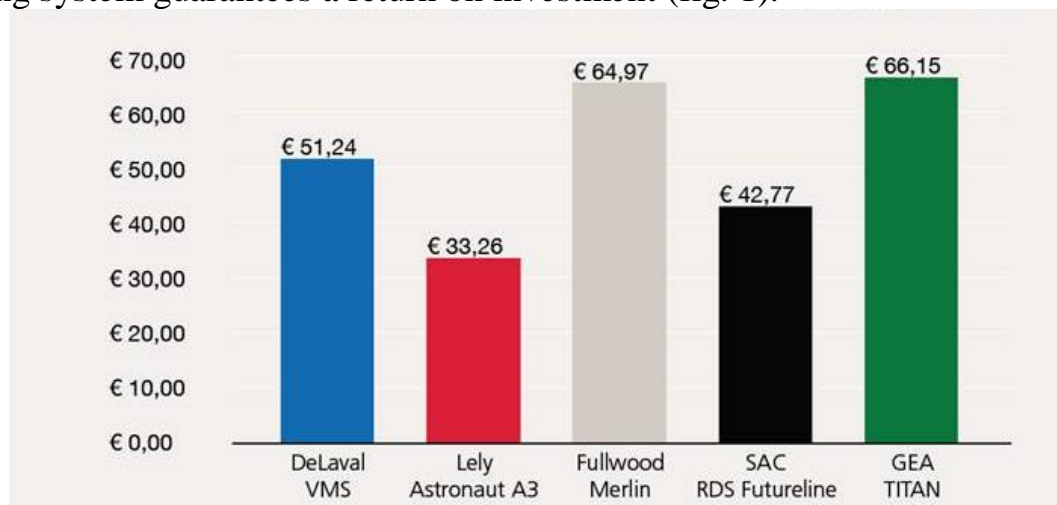


Fig. 1. Efficiency of the milking unit

For the most accurate operation of the manipulator, it is equipped with a 3D camera, which allows you to clearly track all the movements of the animal and perform all operations with minimal movements of the system. This also saves time spent on a single milking, which increases the robot's productivity. The manipulator is very strong and will withstand even if the cow accidentally steps on it. Specially designed brushes for mechanical cleaning of the udder skin rotate in different directions, perfectly perform washing and simultaneously massage the udder.

The robot works 24 hours a day. Given this, animals go to milking when they have a natural desire to give milk. The average daily productivity per cow reaches 37 liters. With the use of milking robot, the yield increased by 5-10%. Milking occurs only when there is a flow of milk. And if traditional milking systems are configured to work with the flow of the entire udder, the robot works with each teat separately. A special Lely 4Effect pulsator has been developed, which, providing an individual approach, regulates the pulsation separately for each quarter.

The robotic system allows you to quickly identify cows with mastitis, because it analyzes the milk of each quarter of the udder, and "remembers" the

indicators of each milking section. Milk that does not meet quality standards, or from a sick animal, the robot hands over separately.

The robot automatically sends a sick cow to the sanitary zone using the selection gate. It is designed to keep up to five sick animals and is equipped with boxes for recreation, a drinking bowl, and access to a feeding table. In this zone, the sick animal can stay all the time while the treatment lasts. It is important that the sick animal does not need to be milked separately - it has the ability to go in and be milked at work, and non-market milk is sent to a separate container. At the same time, the system itself has many tools that help monitor the condition of cows and signal a problem before it occurs.

Milk is transported thanks to a special pump that does not destroy the structure of the milk, while maintaining its highest quality.

In addition, the advantage of this unit is that, in addition to milking, the device performs: cleaning of milking cups with steam, neutralizes up to 99% of all bacteria without the use of chemicals; the system determines the number of somatic cells in milk for each quarter of the udder Lely MQC-C, at the end of each milking, information is already available in the control system; the Lely Titania liquid feed dispenser - dispenses various liquids that are added to the concentrated feed (this dosing system is designed to prevent ketosis by directly adding propyleneglycol to the concentrate); compact pre - cooler, Lely m4use device - for separating of milk and storing it separately; a backup milk tank allows you to continue milking while the main cooler is being flushed; the Lely Shuttle device automatically takes a milk sample at each milking; the cow identification system using radio frequency (ISO / RF) or infrared tags also allows you to get additional information about the health and General condition of the cow, in particular: chewing time, its activity, weight, productivity, feed demand.

All animals are fed with compound feeds and feed mixes that are prepared on the farm. For this purpose, a separate building was built near the farm, which has equipment for mixing and grinding of the feed. From October to May, feed mixes are prepared once a day, and in summer (to prevent food spoilage) – twice. The feed is distributed during the milking process, in accordance with the productivity of the animal.

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