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Fundamentals of Modern Milk Production

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Annotation. A herd of high milk productivity of cows can be created by improving dairy farming and, like any other type of economic activity, efficient, cost-effective, cost-effective. As we know, the main conditions for this are the high professionalism of the staff, the constant improvement of their qualifications in accordance with the latest achievements in the field of milk production, the connection to international integration processes, the use of modern technologies for keeping and milking animals, a solid forage base based on the cultivation of fodder crops. , correct storage and rational use of feed, the correct organization of labor and the use of the world-renowned, most highly productive Black-and-White Holstein breed.

In our Republic, it is necessary to industrially develop dairy farming, which deals with the selection, maintenance and feeding of Holstein-Friesian cattle. At the same time, it is necessary to take into account the content of dairy cattle in the conditions of modern technology, i.e. provide care for cattle in favorable conditions for keeping, feeding and resting cows.

Key words: Dairy productivity, milk quality, efficient, cost-effective, animal husbandry, cow milking, fodder base, fodder crops, labor organization, control, production process, highly productive, livestock size, milk fat, protein, health status, endurance, healthy udder, strong limbs, fecundity, longevity, lifetime productivity, population, genetics, biotechnology, oxygen demand, ventilation systems, air temperature, heat stress, cold wind, draft, rain, snow, acidosis, egg, embryo, pregnancy, fodder table, loose housing, automatic drinkers, bedding, boxes, straw, sawdust, udder inflammation, culling, limb injury, dry cows, cultural pastures, maternity ward , individual treatment, disinfect, veterinary isolation.

Tags: Milk productivity, milk quality, efficient, cost-effective, animal husbandry, cow milking, fodder base, fodder crops, labor organization, control, production process, highly productive, number of livestock, milk fat, protein, health status, endurance, healthy udder, strong limbs, fertility, longevity, lifelong productivity, population, genetics, biotechnology, oxygen demand, ventilation system, air temperature, heat stress, cold wind, draft, rain, snow, acidosis, ovum, embryo, pregnancy, feeding table, loose housing, drinking bowls, bedding, boxes, straw, sawdust, udder inflammation, culling, limb trauma, dry cows, cultivated pastures, maternity ward, individual treatment, disinfection, veterinary isolation ward.

Currently, the President of the Republic of Uzbekistan Sh.M.Mirziyoyev is adopting numerous resolutions and decrees on the further development and well-being of the population of Uzbekistan. Among the adopted resolutions and decrees, the adopted about the further development of animal husbandry in Uzbekistan. For example, resolution P of a resident of the Republic of Uzbekistan Sh.M. Mirziyoyev dated January 29, 2020 "On additional measures of state support for the livestock industry", as well as on November 7, 2019 "On measures to accelerate the development of livestock industries in the Republic of Karakalpakstan".



In order to obtain high milk productivity of cows and improve the quality of milk, it is necessary to improve dairy farming and, like any other type of economic activity, efficient, cost-effective, cost-effective. The main conditions for this are:

1. High professionalism of the staff, continuous improvement of their qualifications in accordance with the latest achievements in the field of milk production.
2. Connection to international integration processes.
3. Use of modern technologies for keeping and milking animals.
4. A solid forage base based on the cultivation of forage crops, the right storage and rational use of feed.
5. Low production costs.
6. Proper organization of labor and constant monitoring of production processes.
7. The use of the world-renowned, most highly productive Black-and-White Holstein breed, thanks to the following indicators:
 - the largest number of livestock in the world;
 - the highest milk productivity;
 - the highest rates of milk fat and protein yield;
 - stable state of health, high endurance, healthy udder and strong limbs ;
 - excellent fertility;
 - High life expectancy with an average lifetime productivity of 35 000 kg of milk.

Creation of the Holstein-Friesian breed and its importance in the world cattle breeding.

The most efficient and highly productive breed in the world. The Holstein-Friesian cattle breed is the most widespread dairy cattle breed in the world. Although Holland is considered the birthplace of this breed, it acquired all its wonderful qualities on the American continent.

The ancestors of the modern Black-and-White Holstein-Friesian breed began to be exported to North America in 1852. In 1880, the owners of dairy farms on two continents created a tribal union to protect their own interests in breeding cattle of this breed. As a result, after 150 years, the Holstein-Friesian breed has become the most common dairy cattle breed in the world. Since 1983, in the USA and Canada, the Holstein-Friesian breed has been called Holstein.

The largest populations of Holstein cattle are found in Europe and North America. For breeding work, scientists and practitioners used the latest achievements of genetics, modern biotechnologies with the wide use of all the innovations that computerization brought with it. And today, the improvement of milk production takes place with close international cooperation, using the latest advances in biology and high technology. A whole industrial direction was formed in dairy farming, dealing with the selection, maintenance and feeding of Holstein-Friesian cattle.

Maintenance of dairy cattle in the conditions of modern technology.

Animal well-being is the key to success. The most expensive and complex area of animal husbandry is the technology of keeping dairy cattle.

A highly productive dairy cow has a very sensitive organism, all the biological and physiological requirements of which must be comprehensively and comprehensively met. When operating dairy farms, we strive to find the optimal balance in the biological, technical and economic aspects of activity. Only the animal that feels comfortable can be highly productive.

It is well known that during the production of one liter of milk, 400 liters of arterial blood passes through the circulatory system of the udder. That is why the oxygen demand of dairy cows is so high.

The height of a modern barn should be 9-12 m. In other words, the height of the building should be equal to the number of tons of milk that is planned to be obtained from one cow. A highly productive dairy cow gives an average of 10 000 kg of milk, therefore, the height of the barn should be 10 m. During the



construction of the building, it is necessary to plan both natural ventilation of the room (windows on the ceiling and walls of the barn) and a modern ventilation system (built-in fans, air conditioners). In hot weather, fans not only cool the air in the room, but also drive flies away from animals. The optimum air temperature should not be lower than 0 °C and not higher than +20 °C. The so-called cold stress occurs at temperatures below -25°C, while heat stress is possible at air temperatures above +25°C. The cow must be protected from all negative environmental influences - cold wind, draft, rain, and snow and summer heat.

In the process of assimilation of feed by animals, a high heat release occurs; therefore a dairy cow tolerates cold much better than heat. Heat protection is a serious technological challenge. With an increase in air temperature, the appetite of animals decreases, as a result of which productivity decreases and the risk of acidosis increases. In addition, in the heat, the success rate of insemination decreases. At high air temperature, a special mechanism of protection against heat stress "turns on" in the animal's body - a special protein begins to be produced. An embryo at a certain stage of development is also capable of producing this protein, but an egg and a fetus at a very early stage of pregnancy do not produce protective protein cells. Scientific studies show that a protein structure that resists heat stress begins to be released from the embryo on the third day of pregnancy. All of the above explains a slight decrease in effective insemination in the summer season.

So, the premises for keeping dairy cows should be spacious, bright, well ventilated and protected from heat. The second most important indicator of the favorable indoor climate of the barn (after air temperature) is relatively low air humidity.

With loose housing, cows have the opportunity to move freely around the barn. Inside the building, a place for rest, walkways and a fodder table should be equipped.

With free-range keeping of animals, all technological processes (cleaning of manure, distribution of feed, etc.) are easy to mechanize. The cows themselves "decide" in which part of the barn they feel most comfortable. In addition, it has been proven that milk production and insemination performance are significantly increased with loose housing.

To keep cows in a safe building, it is necessary to build modern cowsheds. At the same time, the parameters of a modern barn should be as follows.

1. From an organizational and epidemiological point of view, the barn building is a biologically closed system.
2. The design of the barn should provide the possibility of automating all technological processes. Animals need constant supervision.
3. The design of the premises must meet all the requirements that ensure the comfortable well-being of cows, namely:
 - protect from bad weather;
 - be spacious enough;
 - the height of the barn at the highest point must be at least 10 m;
 - the height of the side walls is not less than 3,8 m;
 - an adjustable system of side curtains is required;
 - the presence of both natural and artificial lighting;
 - provide a comfortable and safe place for animals to rest;
 - eliminated the possibility of slipping in the passages for the movement of animals;
 - the size of the surface of the feeding table is sufficient (at the rate of 75 cm/bird);
 - The size of automatic drinkers equipped with a water heating system is sufficient.

There are two options for loose keeping of animals: group, on a deep litter, and individual, in boxes for rest.



Free-box content. Animals kept in boxes are usually cleaner than those kept in a group. When calculating the capacity of the barn, it must be assumed that the number of boxes should be 5-10% more than the number of animals in the barn. Such maintenance also has an advantage in terms of milking hygiene. In addition, much less material is required for bedding in boxes - straw, sand, clay or mats, which are popular today. The boxes are cleaned as they get dirty. The bedding also needs to be changed periodically. It is desirable to sprinkle mats with sawdust. At the same time, it is necessary to monitor the automatic system for cleaning boxes from manure - clogging of the mechanism may occur.

The size of the box is considered comfortable if the cow from a prone position can easily stand up on her feet with one movement (Table 1).

Optimal box sizes for heifers and cows

The live weight of the animal kg	Boxing length, cm	Boxing width, cm
135-180	117-132	76
180-315	152-175	86
315-410	175-190	97
410-500	190-213	107
500-600	213-228	117
600-725	228-244	122

True, it happens that some individuals lie not in the boxes, but in the aisles. These animals are always dirty, they often develop inflammation of the udder and, sooner or later, they will unfortunately be culled. It is important that there are no protruding parts (bolts, pipes, etc.) in the boxes that could cause injury to the cow.

It is necessary to conduct constant monitoring of the behavior of animals. If the cow stands in the box for a long time and does not lie down, this means that the box is not comfortable for rest. If you notice limb injuries in animals, then you need to check if there is any object in the box that prevents the animal from moving. The pipe-limiter along the withers should be located at a distance of 45-65 cm from the support of the box (according to the size of the animal). Proper pipe placement helps keep the box clean.

Group content on a deep litter. Group keeping of animals provides them with more peace and space. In this case, it is much easier to clean and clean the premises than when keeping animals in boxes. We easily solve the issue of mechanization of the process of cleaning dirty flooring and manure. At the same time, it is possible to use manure to fertilize arable land. To ensure a comfortable rest for animals, it is necessary to precede from the fact that one cow should have at least 10-12 m² of area. The amount of straw for bedding is calculated as follows: 6-8 kg of straw per day per head.

The movement of cows around the farm is fraught with injuries to the limbs and hip joints. These injuries often end in the forced slaughter of animals. Therefore, it is very important to ensure the roughness of the slippery surfaces on which the cows move.

To do this, use transverse grooves with a depth of 1-1,5 cm, which exclude the possibility of slipping. These furrows can be applied with a special machine and on existing passages. True, when cleaning manure, the concrete is also ground off and the furrows have to be periodically re-applied. The animals themselves give a clear preference for passages with an elastic rubber coating.

Accommodation of dry cows. A Holstein-Friesian cow should be dry for approximately 60 days. During this period of the animal's life, natural conditions play an important role, primarily the possibility of grazing cows on a cultivated pasture.

It is advisable that the pasture is located near the cowshed. The most important thing is that the animal moves a lot in clean air, especially in natural sunlight. A cultivated pasture is a positive factor in the



comfort of a cow both in summer and in winter.

Premises for dry cows should be equipped in the same way as for dairy cows. The dimensions of the barn are calculated as follows: approximately 18-20% of the livestock should fit in the building.

Maternity ward. 4-5 days before calving, the cows are transferred from the dry cow house to the maternity ward.

Animals should feel comfortable, calmly rest. They should be provided with individual veterinary procedures, if necessary. Particular attention should be paid to hygiene standards.

With free-standing animals, the maternity ward is a cowshed with deep bedding, divided by partitions into several large boxes in which calving takes place in groups (4-5 animals in one hotel group). The arrangement of the premises is no different from a conventional barn (i.e. it has a fodder table, drinking bowls, etc.).

A room for sick animals in quarantine (veterinary isolation ward). When calculating the capacity of the premises for sick animals, it must be assumed that 2-3% of the animals from the total population should be accommodated in the isolation ward. The department should have the possibility of individual treatment of each individual. The isolation room must be cleaned, washed and disinfected much more often than other areas of the barn, so the walls and floor must be covered with a special washable paint. Here, as nowhere else, it is important to comply with hygiene requirements. Equipment must not be transferred from the veterinary isolation room to other premises in order to avoid the spread of infection. There should be a separate entrance for transport to the isolation ward.

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