http://www.moderntechno.de/index.php/meit/article/view/meit23-01-017
DOI: 10.30890/2567-5273.2022-23-01-017

UDC 636.034:636.083.312.3

KEEPING DRY COWS AND HEIFERS IN SECTIONS EQUIPPED WITH COMBIBOXES OR ON DEEP BEDDING AND THEIR ALTERNATIVES

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According to the results of the conducted studies of the microclimate of the reconstructed livestock buildings, it was first proved that the optimal way to keep cows in the dry period is untethered in a separate section with combiboxes, which makes it possible to comply with hygienic requirements, increases the milk production of cows after calving by 15-19% and the body weight of newborn calves by 11.2%. It is established that untethered keeping of dry cows in a separate isolated section equipped with combiboxes or tethered in a separate isolated section provides optimal air temperature values, it helps to reduce the level of carbon dioxide by 0.06-0.08%, relative humidity - by 16-20%, microbial air pollution - by 2.1-2.3 times, the level of industrial noise - by 6.5-7.9 times, improves the efficiency of use of production areas and internal equipment of the premises.

Keywords: *dry period, cows, housing, boxes, sections, combiboxes, deep bedding, alternative.*

Reforming the agricultural sector of our country has posed a number of problems for agricultural enterprises, the solution of which depends not only on the transition to a market economy, but also on the further development of the industry and the introduction of modern technologies in the production of livestock products.

The transition of agricultural enterprises to market principles of management has put before the domestic science and practice a number of unresolved problems in improving [1, 5, 7, 21] existing and developing new effective technological solutions in the field of livestock production. One of such problems is the reduction in the number of cattle in farms, which in turn led to the keeping of different sex and age groups of animals together indoors, especially in the winter-stall period. At the same time, it is not always possible to ensure full compliance with the hygienic requirements for the maintenance of different technological groups of cattle in accordance with the Departmental norms of technological design (VNTP - AIC - 01.05).

The small number of cattle in most farms does not allow to apply modern technologies of milk production, increase its quantity and improve its quality. Therefore, along with the increase in the number of livestock, it is planned to reconstruct the existing livestock facilities in order to ensure the most optimal conditions for keeping animals. Of particular importance under such conditions are modern methods of keeping dry and lactating cows in the winter-stall period [17, 27, 31]. Under different technologies of milk production, the way of keeping animals depends on the resistance of their organism, the state of the mammary gland and milk productivity, milk quality, reproductive capacity and service life.

Therefore, studies [6, 9] on determining the most optimal way of keeping dry cows in the winter-stall period based on the study of microclimate parameters of the premises, their influence on immunological reactivity, milk production, milk quality and viability of the offspring are relevant now [1, 30].

Dry period is one of the most important structural elements in milk production technology. This period is necessary for the normal development of the fetus. It is established [3, 8] that milking a cow from calving to calving leads to premature loss of its economic value.

Shortened dry period and unsatisfactory feeding are the main causes of premature "exhaustion" of the cow's body and the birth of a weak, non-viable offspring.

According to literature data [11, 26, 29], not only the conditions of keeping cows in the dry period, but also the duration of the dry period and pregnancy have a significant impact on the intensity of embryonic and early postembryonic development of calves.

The influence of the dry period should not be considered in isolation, but necessarily in combination with the conditions of keeping and feeding of dry cows [7, 23, 33]. Due to the lack of special premises, cows in many milk production enterprises are kept in stalls in all physiological periods. This has a negative impact on the health of late lactating cows, which leads to nervous stress and additional stress in the body of cows.

In addition, it was found that in all physiological periods cows are constantly kept in stalls on a tether (based on the materials of the certification of milk production enterprises). The certification of existing milk production enterprises showed that this negatively affects the health of late lactating cows (noise of milking machines, the process of milking other cows, noise from the movements of feeders, manure conveyors, etc.

The difficulties lie in the fact that alternative studies in the conditions of small agricultural enterprises for the maintenance of dry cows have not been carried out, so in production conditions there is no consensus among specialists. As practice shows, dry cows are kept mainly on a tether together with dairy cows. In some farms there are different ways of keeping dry cows: untethered on deep litter, in boxes, etc.

Conducting such studies was dictated by the fact that today the Departmental norms of technological design of livestock enterprises do not provide recommendations for the joint maintenance of different sex and age groups of animals in a separate livestock building. As a rule, due to a sharp decrease in livestock in farms, cattle of different technological groups are kept in the barn today

Under such conditions, the production of milk, beef and rearing of young animals cannot be effective [12, 13, 14] without the development of new achievements of science and practice, which are based not only on experimental data and practical experience, but also take into account recommendations for the reconstruction of production facilities in order to ensure a high functional state of the animal organism.

The latter depends on many factors, namely: age, genetic potential, microclimate indicators, state of internal organs, especially cardiovascular and respiratory systems,

immune protection, hematological indicators, metabolism.

Particular importance in maintaining a high functional state of the body of cows, especially dry cows in the stall period, is given to the method of their maintenance, which affects future milk production. The evaluation of different ways of keeping dry cows showed that on small farms they do not meet the established requirements, as they do not provide normal preparation of cows for calving, subsequent lactation and obtaining a healthy offspring [4, 18, 24].

The introduction of effective ways of keeping cattle is possible only with the rational use of new approaches to the design of stalls and boxes for keeping cows during the dry period in isolated sections. For this purpose, we used existing structural elements in typical barns, bringing them as close as possible to existing standard projects. Separation of dry cows from lactating cows in a separate technological group, transferring them to a special diet, in a separate isolated section, which was constructed of wooden partitions, arranging in one case tetherless housing (combiboxes), and in the second tethered housing in stalls, contributed to a much better microclimate in this part of the room, compliance with sanitary and hygienic requirements for production noise, microbial load, preparation of cows for calving, higher live weight of calves and their good safety, and after calving cows - better milk production both for the first month and for 305 days of lactation. The expediency of separating dry cows from lactating cows in a separate room is also indicated by a number of other researchers.

The production of products from dairy cattle is one of the most important and problematic today. At present, it requires the introduction of innovative approaches and solutions that will be easily and quickly integrated into the production process and will make it possible to comply with veterinary and sanitary requirements and technological design standards. One of the ways to accelerate the increase in the amount of marketable milk production is the introduction of energy-saving technology, which, with the rational use of the production area of the barn for the placement of dairy cattle breeds, will increase the profitability of production, make a profit and increase the rationality of the usable floor area several times.

According to scientists [1, 4, 5], the violation of technological connections has led to problems in creating a regulatory air environment in livestock buildings, namely: an increase in the thermal resistance of building envelopes without the use of artificial heating and ventilation; additional costs for equipment in livestock buildings of heating and forced ventilation systems; installation of equipment to maintain the necessary microclimate using heat exchange ventilation systems (if possible without the use of heating and ventilation). Solving these issues increase the energy efficiency of livestock production, but require scientific justification of the feasibility of using significant material costs. In addition, compliance with hygiene standards and established veterinary and sanitary requirements for different ways of keeping livestock also ensures the preservation of its health [2, 15, 19].

Today, in Vinnytsia region, a significant number of livestock buildings need restoration, reconstruction and technical re-equipment, which must be carried out in accordance with the standards, provided that the residual value is about 40%. Therefore, it is advisable to provide for the reconstruction for the production of

livestock products, which requires a minimum amount of costs for technological processes.

A comparative assessment of the keeping of dry cows in combiboxes and on deep bedding was carried out taking into account the total accommodation in the premises: 52 dry cows, 16 newborn cows, 16 cages for calves of the preventive period, 18 heifers and auxiliary premises (service personnel, equipment, feed and bedding and dairy).

In combibox housing, manure removal is carried out by conveyors US-1.5 and TSG-2.0 B. When keeping animals on deep litter, manure is removed by bulldozer.

The use of production areas in the maintenance of dry cows and heifers with their subsequent calving and after the hotel period; the maintenance of calves in preventive clinics by the following indicators: the total number of animals in the building, the size of the building, the total area, the use of the total area per head, the use of the area for group cages and in the stall and per head, the use of production areas as a percentage of the total area, the total cost of reconstruction and per cattle place, the level of design and technological regime is determined [10, 16

In the enterprise for milk production for 256 cows for the maintenance of dry cows 52 places are needed, or 20.31% of the total number of cows, taking into account the increase of hotels in winter by 24%. To complete the technological groups 52 heads are divided into 4 groups of 13 heads. According to the first variant of the research, it is planned to keep dry cows untethered in combine boxes for resting near the feeders (feeding table). The stall for resting and feeding dry cows is of the following size: 1.5 m wide and 2.0 m long (Fig. 1). In addition to dry cows, heifers are kept in the room for 2-3 months before hotels in two groups of 8 heads. Cows are calving in 3.9×3 m (11.7m2) sheds equipped with a feeder, watering trough and stall with a thick layer of straw. After calving, cows are transferred to 16 stalls equipped with individual tethering, automatic watering at the rate of one for two newborn cows, which are kept for 20 days. Milking of cows is carried out at the milking unit UDP-1 using the milking machine DA-50. In addition to milking cows, this unit is used to prepare heifers for the next lactation. Calves from the dairies are transferred to one of two preventoriums with 8 individual cages, where they are kept until 20 days of age. Individual cages for calves are with a thick layer of litter, round in shape, 1.2 m in diameter with a wooden floor.

Feed distribution is provided by mobile transport. The use of electric cars for feed distribution provides a reduction in stress factors that arise in the premises for keeping dry cows, heifers, cows in calving and calves in preventive clinics than when driving tractors with trailers such as KTU and others.

It is essential to remove manure in the premises for cattle. In combibox free-stall housing, preference is given to delta scrapers of the US type with subsequent removal of manure from the room by a TSG-2.0 B manure conveyor.

This building provides utility rooms for service personnel, equipment, milking equipment, feed and dairy. The entrances are equipped with disinfectants.

In order to find a more efficient use of space, studies have been conducted on the use of keeping dry cows on deep litter. Indicators of cows' rest comfort are closely related to the way of keeping, which is probably due to the emergence of a

number of conditioned reflexes in animals that have been resting in boxes for a long time, as well as feeding and watering methods.

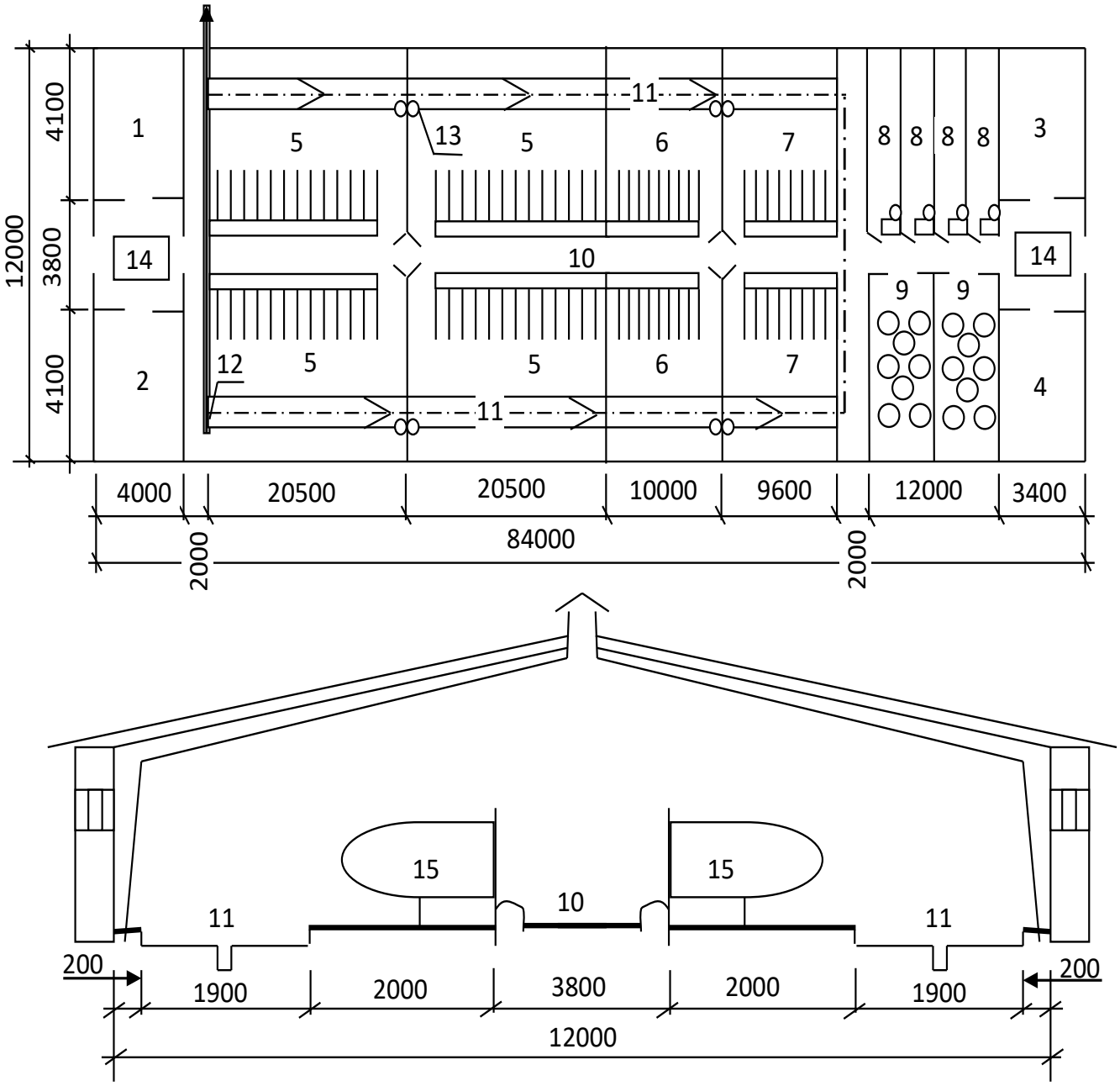

Figure 1 - Cowshed for keeping dry cows, heifers 2-3 months before calving, cows in day cowsheds, calf and newborn cows of a milk production farm for 256 cows (option of combiboxes)

1-premises for service personnel; 2-premises for milking equipment; 3-premises for feed; 4-premises for milk preparation; 5-group cage for 13 dry cows; 6-group cage for 9 heifers; 7-binding cage for newborn cows (8 heads); 8-days for hotels (4 pieces); 9-preventorium for calves up to 20 days of age (2 compartments of 8 individual cages); 10-feeding table; 11-delta scraper (US-1,5); 12-manure conveyor TSG-2,0B; 13-auto drinker; 14-desiccators; 15-combi-boxes.

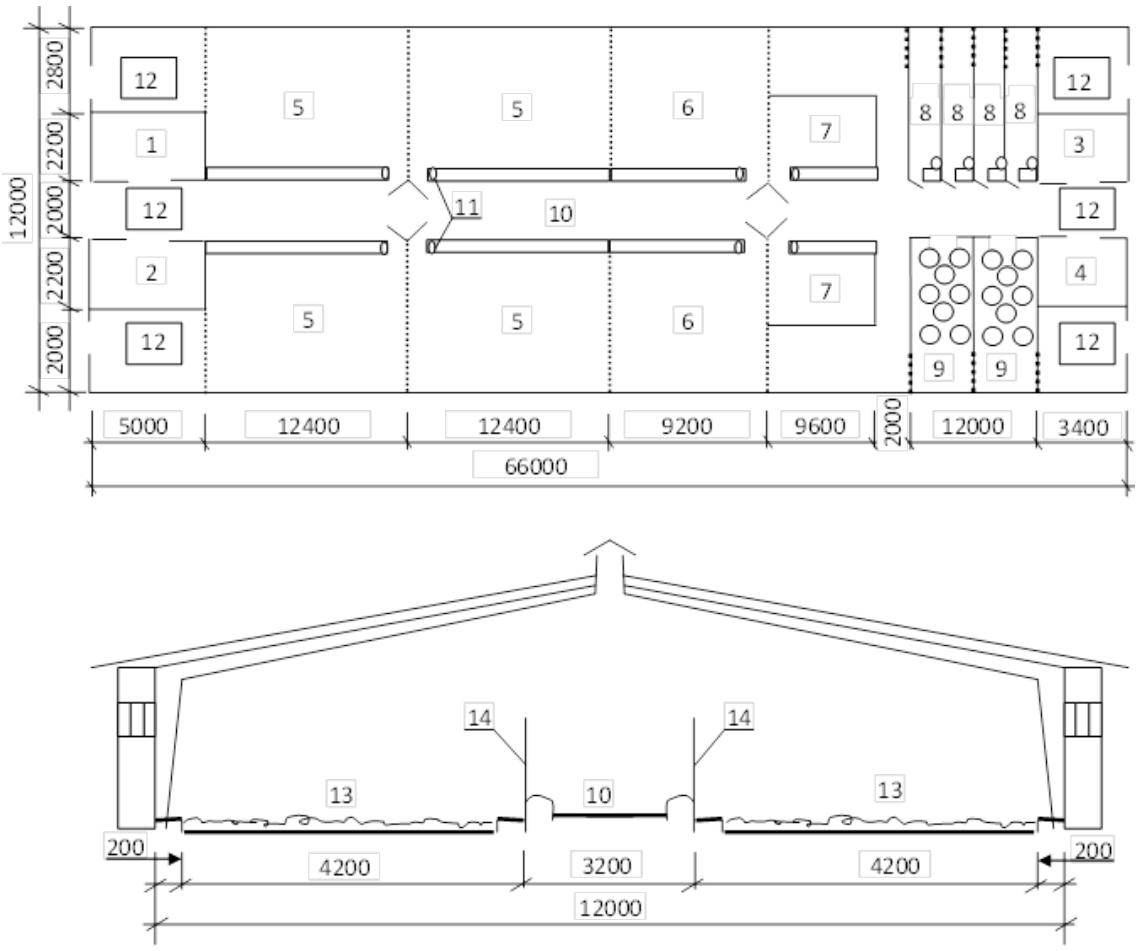

Figure - 2 Cowshed for keeping dry cows, heifers 2-3 months before calving, cows in day cows, preventive clinic for calves and newborn cows of a milk production farm for 256 cows (option on deep litter)

1-premises for service personnel; 2-milking equipment; 3-premises for feed; 4-premises for milk preparation; 5-group cage for 13 dry cows; 6-group cage for 9 heifers; 7-binding of newborn cows (8 heads); 8-days for hotels (4 pieces); 9-preventorium for calves up to 20 days of age (2 departments for 8 individual cages); 10-feeding table; 11-auto drinker; 12-dezkimki; 13-deep litter; 14-feeding grate.

According to VNTP-APK-01.05, the maintenance of dry cows and heifers requires the equipment of group cages, which should have appropriate parameters for the feeding front and area. Thus, for dry cows and heifers 2-3 months before hotels, it is necessary to have a minimum floor of 4 m^2 per head in a group cage with a feeding front of 0.8 m of feeding table.

Keeping dry cows and heifers untethered on deep bedding provides for the removal of manure after each technological period by bulldozer to mobile transport. Therefore, Figure 2 shows the option of keeping dry cows and heifers in group cages measuring 4.2×12.4 m for 13 dry cows (area per head 4.0 m^2) and for 9 heifers - in a cage 4.2×9.2 m (area per head 4.29 m^2).

Keeping of cows after calving, during calving and calves in preventive clinics is the same as in the case of keeping dry cows and heifers in combiboxes and keeping on deep bedding.

Table 1 - Use of production space when keeping dry cows and heifers in combine cowsheds and on deep bedding of milk production enterprise for 256 cows

Indicator	*Method of detention*		*In % combibox to deep litter*
	combibox	*on a deep litter*	
Total number of livestock places, pcs.	106	106	100
Dimensions of the building, m	12×84	12×66	-
Total area, m^2: total	1008	792	127,3
including per head	9,51	7,47	127,3
Used area in cages and stalls, m^2: total	562,2	443,2	126,8
including for 1 head	5,30	4,18	126,8
Use of area for keeping animals, in % of total	55,77	55,96	99,7
Reconstruction cost, thousand UAH: total	964,5	487,2	198,0
per 1 cattle place	9,10	4,60	198,0
Savings per livestock month, UAH	4,5	-	
Savings equivalent to milk, kg	1500	-	
Energy equivalent savings, MJ	4605	-	
Savings equivalent to electricity, kWh	383,75	-	

Table 1 presents a comparative characteristic of the use of production areas of dry cows and heifers with their subsequent calving in dairies and after the hotel keeping of cows and calves in preventoriums.

It shows that the equipment of combiboxes requires 27.3% more production space than when keeping dry cows and heifers 2-3 months before hotels, on deep bedding.

It is important that for the reconstruction of a building measuring 12×84 m with a combibox for dry cows and heifers, 964.5 thousand UAH are needed. At the same time, 98% less material costs are needed to equip the premises for these animals when kept on deep litter. This is due to the fact that the corresponding costs are necessary for the purchase and installation of manure conveyors TSG-2,0 B and US-1,5. Significant costs are shown for the equipment of combine boxes and floors for resting dry cows and heifers.

It is characteristic that the hygienic conditions in the reconstructed building meet the regulatory parameters of the microclimate at the level of the optimal design and technological regime.

So, the building 12×84 m accommodates dry cows, heifers 2-3 months before calving in the dairies for hotels, preventive clinics for calves and newborn cows of the milk production farm for 256 cows with equipment for dry cows and heifers of combiboxes, and when keeping them on deep litter, a building of 12×66 m is needed.

It is proved that to accommodate 106 heads of cattle, it is necessary to use 27.3% less total building area and 98% less reconstruction costs compared to keeping them in combiboxes. The hygienic level of keeping animals in the reconstructed buildings corresponds to the regulatory parameters of the microclimate at the level of the optimal design and technological regime, so the choice of the method of keeping animals depends on the specific conditions of the milk production enterprise,

especially the availability of the necessary amount of bedding and space.

In addition, it was found that the savings from the reconstruction for keeping cows on deep litter per one cattle place is 4.5 thousand UAH, which is equivalent to 1500 kg of milk, its energy 4605 MJ and 383.75 kW / h of combine units. Therefore, it is advisable to give preference to the keeping of dry cows and heifers in conditions of free housing on deep bedding during the reconstruction of livestock buildings.

During the years of formation of the agrarian sector of Ukraine, the flow-shop milk systems in most milk production enterprises ceased to operate. This was mainly due to a significant reduction in the number of cows, which led to the filling of the maternity departments by 20-25%. In such conditions, ensuring optimal conditions of hotels and reception of newborn calves, prevention of postpartum diseases of cows is violated. The transfer of hotels in the stalls where cows are constantly kept, calves are placed near cows, this leads to the spread of mammary gland disease in cows, the emergence of enzometritis, violation of regulatory sanitary and hygienic parameters for newborn calves in cold, dirty and damp rooms. The flow-shop system of milk production on an industrial basis includes frequent regrouping of animals, the formation of new sections, changes in feeding and housing conditions, the introduction of different milking regimes in the maternity ward and the production sector (milking parlor). These and other factors are rational from the point of view of current production, but often cause stress in animals, which adversely affects their nervous system and hormonal status, disrupts the vital rhythm, and as a result, can lead to a decrease in productivity and premature culling.

Thus, it is advisable for specialists working in dairy farming to introduce a comprehensive training of heifers using pneumatic udder massage in the second half of pregnancy. The formation of the dairy herd should be carried out by animals at the end of the first lactation. According to the Departmental norms of technological design of livestock enterprises, maternity departments (sections) are provided for calving cows and heifers.

On farms of small capacity it is necessary to use part of the livestock building for the maternity department. In each particular enterprise, depending on the capacity, a technological project of the maternity department is developed.

Preventive measures for animals are provided by hygienic conditions of detention, standardized feeding, veterinary and sanitary measures, etc. There can be many options for the placement of maternity wards, but the basic provisions are the same in all maternity wards, which is relevant in the reconstruction of existing buildings.

Research methodology. In the building 12 x 72 m, a part of the room is allocated where the maternity ward for a milk production farm for 64 cows is located. The number of livestock places in the maternity department is proposed to provide 70% of hotels in the winter-spring period, that is 45 hotels. For the hotels of cows kept in the prenatal section it is necessary 7 days, hotel 2-3 days, after hotels-10 days, a total of 20 days: 45x20/120 9 places.

Fetal genes are the main factor that determines the intensity of growth and the period of accumulation of critical mass, at which the fetus induces signals that form the prenatal and birth situations in physiological conditions. The term of fruiting

depends not only on the intensity of fetal weight gain, but also on the speed of maturation of its signaling system, that is, the hypothalamic-pituitary-adrenal complex.

In each section of the maternity ward for cows there are the following livestock places: in the prenatal - 8 x 7/20 3 places; in the delivery room - 8 x 3/20 = 2 places (1.2 rounded to 2); in the postpartum period - 8 x 10/20 = 4 places.

In the dispensary calves are kept until 20 days of age. Then it is necessary to provide: 45 x 20/120 = 8 places. For deep-calving cows, the stall is 1.5m, for newborn cows - 1.2m, the size of the day house for hotels is 2.5 x 3.0m. Calves are kept in the dispensary in individual cages. All other parameters of stalls and cages are equipped in accordance with VNTP-APK - 01.05.

The development of the technological project provides for: maternity department of the farm for milk production with strict observance of preventive, veterinary and sanitary and technological measures that guarantee the protection of animals from the introduction of pathogens. Thus, cleanliness is constantly maintained in maternity wards, calf dispensaries, feed and bedding rooms, disinfection, disinsection, deratization are systematically carried out.

In the conditions of small farms, dry cows and heifers are transferred to the maternity section before the planned calving in 7 days. Before transferring to the maternity section, animals are cleaned, contaminated areas are washed with warm clean water and wiped dry, hooves are cleaned of manure and disinfected with 1-2% formaldehyde solution or 0.5% caustic soda solution (Fig. 3).

In the section for cows before calving they are kept in three tethered stalls. For calving, there are pens. The cows are transferred to the pens when there are signs of calving. After calving, cows with calves are kept for 2 days, and then in a section of 4 stalls. Cows are kept tethered, but milked manually.

It is important to observe preventive measures for the care of newborn cows, which are given a bucket of warm salted water every half hour. In the dairy cow with calf is kept on a deep straw bedding. The cow licks the calf. After two days the calf is transferred to the dispensary. Individual round-shaped cages placed on a 20-30 cm layer of straw, where the calf is kept up to 20 days of life. This design of the cage allows you to control the health of the calf and prevents them from licking.

For the prevention of calf diseases, colostrum is given to calves in 45-60 minutes after birth. The norm of drinking colostrum 3-4 times a day is 1.5 liters. Normal colostrum in the first days has a light cream color. From the first days of life, newborn calves need water.

An hour after drinking colostrum, calves are given cooled boiled water (temperature +20 ° C). From the age of 5 days, calves are given benign hay. From the 15th day - concentrated feed, fodder carrots and beets.

On the 21st day of life, calves are transferred to specially equipped group cages (in this room or in another). After each calving, in order to prevent the development and accumulation of conditionally pathogenic and pathogenic microflora in the dairy and maternity sections, the litter, fetal water is cleaned, dirty litter is cleaned and replaced with new one. Once a week, sanitary cleaning and disinfection of all vacated stalls and cages, technological passages, drainage grooves are carried out.

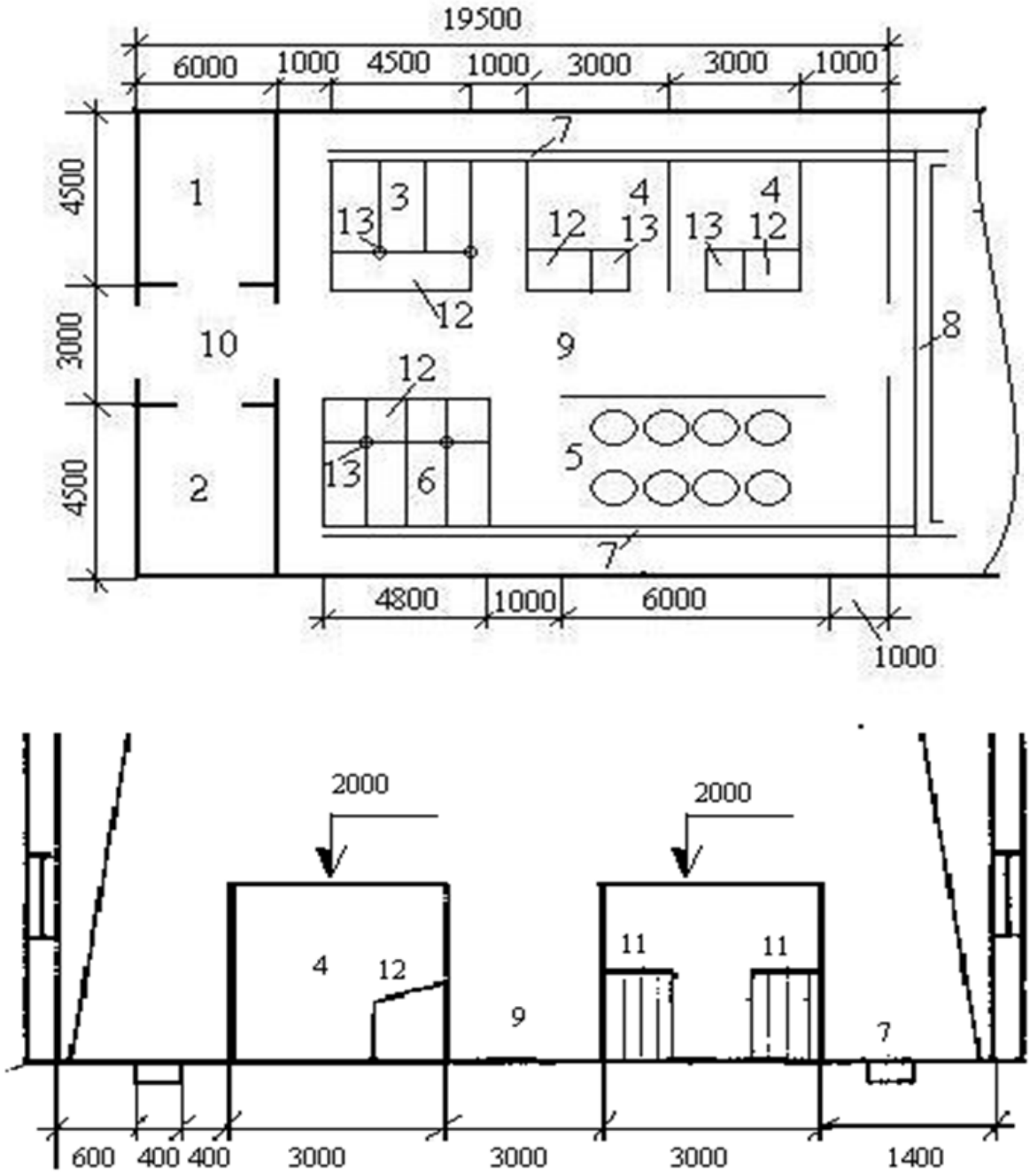

Figure - 3 Plan and section of the building with a width of 12 meters of frame construction with the placement of the maternity section for a farm for 64 cows.
1-room for service personnel, veterinarians, specialists and equipment; 2-room for bedding and feed; C-section for cows before calving; 4-day stalls for calving; 5-preventorium for calves; 6-section for cows after calving; 7-manure channels; 8-manure conveyor; 9-technological passage; 10-vestibule; 11-individual cages for calves; 12-feeders; 13-auto waterers.

Sections of the maternity department in the presented technological design of the part of the building 12 m wide by 10.5 m provide for compliance with hygienic parameters of the microclimate. The enclosing structures of the maternity unit provide storage of heat emitted by cows and calves. Floors for keeping cows and calves are wooden, which retain heat well and are most accessible during the

reconstruction of maternity departments. The relative humidity should be under special control, which should not increase to 78%. Thus, cleanliness, optimal temperature and moderate humidity are components of the healthy condition of calves. In the presence of dust and harmful gases, the barrier functions of the respiratory tract in calves are weakened.

In addition to general preventive measures for the arrangement of maternity departments for a farm for 64 cows, it is advisable to offer special measures. Thus, it is necessary to constantly monitor the level and state of metabolic processes in cows and heifers. The reserve alkalinity, the content of calcium, inorganic phosphorus, carotene, total protein and sugar in the blood of cows, and the content of ketone bodies in urine and milk are investigated. In case of calf diseases, they are isolated, litter and manure from sick calves are burned.

In summer, the premises of the maternity department are temporarily freed from animals, thoroughly cleaned, disinfected three times and sanitized for 1.5-2 months. Near the maternity department, walking and feeding grounds are equipped for the organization of walks and mocions for cows. It is important to ensure a quick outflow of water on the walking grounds.

Systematic control over the technology of feeding cows and calves in the maternity department is involved in the maintenance of relevant documentation: evaluation of diets for nutrients; control over feed intake; organoleptic evaluation of feed; compliance of average daily weight gain with a given diet, feeding regime and feed preparation technology; control over the implementation of the daily routine; control over sanitary days; control over metabolism.

The maternity department and dispensary works on the principle of closed type. Thus, at the entrance to the maternity ward, there are disinfectant trays, which are systematically filled with disinfectant solution.

The organization of work in the maternity department and the calf dispensary is carried out by an operator who serves cows and calves. He prepares cows for calving, monitors the condition of the mammary gland, prevents functional disorders of tissues, ensures the completeness of milking, massages the udder, and milks newborn cows.

The load on the operator is three cows before calving, two in the dairies, four after calving and eight calves of preventive age.

The operator's duties include a strict regime of giving milk to calves, maintaining cleanliness of the premises and calves, replacing bedding and weighing calves.

Thus, with planned calving of 62 cows and 10 first-calf cows, calf safety is 82% or 59 calves. In moderate conditions, the safety of calves reaches 98.4% or 1370 calves - 69. The energy consumption of newborn calves in the new conditions is only 274.4 MJ, and according to the old technology 363.9 MJ. Thus, 3356.6 MJ were saved, which is equivalent to 279.7 kWh of electricity.

At night, the condition of calves in the maternity department is monitored by an employee on duty, who is appointed one for the entire building.

Thus, it was established that in the part of the building 12 meters wide there is a maternity ward for the farm for 64 cows: three stalls for cows before calving in 7

days; two day cages for calving; four stalls for cows after calving and eight individual cages for calves of the preventive period, as a result of such placement in an isolated maternity ward, the prevention of calf disease is ensured.

To accommodate a maternity unit for a farm with 64 cows, 12 x 19.5m or 234 m^2 of production space is required in a 12 x 72 m building.

Conclusions.

On the basis of experimental studies, the advantage of untethered keeping of dry cows of the Ukrainian black-and-white dairy breed in a separate section of the barn over tethered keeping in stalls has been proved, which is achieved by reconstruction of livestock buildings and ensuring optimal microclimate parameters.

The expediency of applying new approaches to the calculation of the number of livestock places in livestock buildings, which depends on the number and duration of stay of animals in the corresponding sex and age group, as well as the pace of herd expansion, is shown. For keeping cows of the Ukrainian Black-and-White dairy breed it is recommended to use stalls, the size of which depends on their body weight and the oblique length of the body.

The most comfortable in terms of microclimate parameters (reducing the content of harmful gases, water vapor, the number of microorganisms in the air and noise arising from the operation of machines and mechanisms in the process of milk production) is the separation of dry cows from milking cows in an isolated section equipped with free-stall cubicles.

In addition, keeping calves, young animals and heifers free-range in group cages on deep bedding and tethered keeping of some groups of cows allows to receive 2257 tons of organic fertilizers per year, which provides fertilization of 150 hectares of sown areas and receipt of 42 c feed per conditional head of fodder.

In the 18×72 m building, the farmer produces 3200 kg of milk, raises 14 heifers and sells 286 kg of beef, which allows him to make a profit of 205.5 thousand UAH without taking into account the production of 2257 tons of organic fertilizer. Recoupment of reconstruction costs is 2.37 years, and new construction - 8.96 years.

The use of the latest technologies in the new construction of milk production enterprises requires significant capital investments. In a highly mechanized enterprise, capital investment per cattle place reaches up to 25 thousand UAH. When reconstructing a livestock building, capital investments are reduced by 2-4 times depending on the use of equipment and its cost.

The reconstruction of the livestock building for the maintenance and operation of only dairy cows with a milk yield of more than 5000 kg of milk per year is relevant. Therefore, it is necessary to take a comprehensive approach to the assessment of energy-saving technological solutions for the maintenance of cows, their milking, manure removal, feed distribution, etc.

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