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СЕЛЬСКОХОЗЯЙСТВЕННЫЕ НАУКИ

ФАРМАЦЕВТИЧЕСКИЕ НАУКИ

ХИМИЧЕСКИЕ НАУКИ

СЕЛЬСКОХОЗЯЙСТВЕННЫЕ НАУКИ

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THE INFLUENCE OF THE AGENDA ON THE PRODUCTIVITY OF COWS OF DIFFERENT LACTATIONS UNDER DIFFERENT KEEPING REGIMES

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ABSTRACT

It was found that during lactation the milking of cows in the experimental groups at the constant regime were at the level of 4639 kg of milk, which is more than at the variable regime by 159.8 kg or 3.57%. As a result, the cost of feed in the variable mode of the day per 1 kg of milk was 1.38 feed units, and at constant - 1.10 feed units, which is less than 0.28 feed units or 20.3%. The constant daily routine reduced labor costs in milk production by 9.7%, and by 1 quintal of milk - 34.2%.

It is presented that it is inexpedient to violate the daily routine, which leads to the loss of marketable milk by more than 3.6%.

Key words: productivity, hopes, routine, lactation, microclimate, constant, variable, mode.

Actuality of theme. Milk production requires a clear technology in terms of compliance with the daily routine and established sanitary and hygienic requirements and technological standards. It is known that from the point of view of biochemical processes in a living organism of a cow during one day a number of physiological processes take place - metabolism, oxygen transfer, release of harmful substances, excretion of milk during milking, etc.

Scientists [4, 8] found that the behavioral responses of cows are associated with biological clocks and acquired reflexes and inherited from mother cows, and accordingly it is important to study the factors that affect the body and productivity of livestock. Without the influence of stimuli from the environment that surrounds the animal, it is not possible to form a correct assessment and determine the optimal conditions for keeping, feeding and caring for animals, so our research aims to study the conditions of keeping mother cows and obtaining healthy calves.

The formation of milk after calving is accompanied by the impact on the body of endocrine glands (pituitary gland, adrenal glands, thyroid gland). The effects of hormones on the body have been studied and continue to be studied by scientists around the world [3, 10], they describe the effects of circadian rhythms, which are closely related to the daily routine set by technological needs for animal care operations. Accordingly, conditioned reflexes in response to a number of stimuli: sound, light and others, motivate the animal to certain actions at the appropriate time of day. The circadian rhythms in cows are very complex, which are controlled by the central and peripheral clocks.

Physiological processes of cows depend on the coordination of many rhythms in the body (eating food, chewing gum, digestion of food, absorption of nutrients, their distribution in the body, milk production, milk production, rest, sleep and other physiological processes) that occur at the appropriate time. Maintaining the longevity and health of each cow depends on the efficient use of feed and the constant operation of the farm. To fulfill this biological condition, it is necessary to keep and operate cows with each operation at the same time of day [1, 7].

Introducing innovative approaches, improvements or technological re-equipment into the production process leads to appropriate changes, and as a consequence of readjustment of animals and the formation of behavioral reactions that differ from previously established observations. Needs clarification and conclusion of possible deviations for each cow in accordance with changes in the process of milk production and obtaining healthy offspring. We set a goal of clear birth control from experimental groups of calves, study of their behavioral reactions and productive qualities - live weight gain, changes in body structure indices by measurements in different periods of rearing, which will group cows and calves on these grounds and develop appropriate technological and sanitary and hygienic operating conditions [2, 5].

Review of literature sources. The market transformation of milk production has shown that the supply of milk and dairy products must be adjusted to demand, and not vice versa [3]. This leads to the need to adapt the dairy subcomplex to market requirements, ie to the preferences and needs of consumers. This is especially important in the context of the strategy of European integration, as failure to realize this will make unrealistic and impossible competitiveness of the domestic dairy subcomplex [7].

It is necessary to search for innovative effective levers for further improvement of organizational and functional structures of the market, the formation of its

food resources, focus on the production of quality products [9].

For self-sufficiency of farms with energy in the conditions of keeping cattle for beef and milk production in livestock enterprises of Vinnytsia region it is possible to successfully introduce biogas plants.

The state program for the development of dairy farming provides for a significant increase in milk production, application of new technologies, technical and architectural solutions in the creation of industrial dairy complexes, reconstruction of existing enterprises and small farms, improvement of feeding and exploitation of animals, improvement of livestock reproduction and veterinary support. industry [9].

Materials and methods of research. Livestock feeding is the same and meets the standards provided by the farm "Shcherbych" p. The village of Lityn district of Vinnytsia region, three times a day.

Two groups of experimental cows of 10 heads in each were formed, animals were selected on the principle of analogue groups taking into account their live weight (± 20 kg), clinical indicators, age, lactation.

Keeping cows in cowsheds 12 × 78 m in a loose manner with the rest of the animals in the boxes, feeding front - 0.9 m per head, watering from drinking bowls with fixed water supply, manure removal with a scraper unit three times after feeding. In the comfort zone there are massagers of the body of animals with the installed sensor of automatic switching on when approaching cows.

In the cowshed - 4 sections for group keeping of cows of the Ukrainian black-and-white dairy breed, in each on 30 heads all - 120. In the first row placement of cows at a constant mode of day, and in the second at application of a variable schedule. To study their milk productivity, 5 dairy cows of different lactations (from the first to the fifth inclusive) were selected from each section, ie 2 heads of each lactation and in each group.

Research results. With the introduction of new approaches, research has shown that a constant daily routine of cows at the same time increased milk yield, improved feed payment, extended the period of use of animals, which is a significant reserve that can be used to increase milk production from dairy cattle productivity. The act of milk production of cows of the Ukrainian black-spotted dairy breed fixes the advantage which allows to provide effective allocation of milk from a mammary gland whereas the unconditional reflex on milk production stimulates process of systematic reception of milk. The return of milk by the animal under the action of the hormonal system, namely the injection of the hormone oxytocin into the blood stimulates the secretion of milk for 7 minutes, and stops regardless of whether the cow is completely milked.

Therefore, the completeness of milking cows must be taken into account in machine milking, it should be aimed at timely faster milking of animals, and the incentive for this operation are preparatory operations such as massage, washing the udder and the roar of the vacuum milking system. The movement of cows from the cowshed to the waiting room affects the process of milk production in some animals, in others this factor is triggered by putting milking equipment on teats, in others in the process of massage or direct milking, so you need to form groups according to biological and physiological characteristics of animals and it is the replenishment of groups of cows to perform after experimental studies.

Indicators of milk production in comparison with the constant daily routine to the variable are shown in table 1.

Table 1

Milk production in different periods of lactation by comparing the constant and variable daily routine, n = 10 (M ± m)

Indicator	Lactation period, days							
	30	90	120	150	180	210	240	270
Constant daily routine								
Day's hopes, kg	18,2± 1,24	19,1	17,9	16,8	15,6	13,8	11,6	9,8
Milking duration, min	7,24	7,31	6,92	6,11	6,97	6,81	6,12	5,92
Milking rate, kg / min	2,51± 0,03	2,61± 0,04	2,59± 0,03	2,75± 0,03	2,24± 0,03	2,03± 0,05	1,90± 0,03	1,66± 0,03
Completeness milk yield,%	75,1± 2,31	77,4± 3,07	80,5± 3,22	79,2± 2,14	75,2± 3,21	81,7± 4,12	88,1± 4,07	90,4± 4,26
Hand milking, kg	1,56	2,15	1,20	1,31	1,38	2,05	1,53	1,25
Variable daily routine								
Day's hopes, kg	18,4± 2,17	18,5± 1,65	17,2± 1,23	16,1± 1,52	14,8± 1,62	13,0± 1,28	10,7± 1,38	9,1± 1,22
Milking duration, min	8,11	7,84	7,23	7,13	7,01	6,54	6,11	5,84
Milking rate, kg / min	2,27± 0,06	2,36± 0,02	2,38± 0,03	2,26± 0,03	2,11± 0,03	1,99± 0,03	1,75± 0,03	1,56± 0,02
Completeness milk yield,%	70,4± 2,41	75,3± 2,34	77,4± 2,56	76,6± 3,21	72,7± 2,62	78,6± 2,68	80,4± 3,45	85,6± 3,58
Manual milking, kg	2,25	2,44	2,31	2,12	2,27	2,41	2,05	1,84

From the data of table 1 it is seen that during the lactation period of milking cows in the experimental groups at the constant mode were at the level of 4639 kg of milk, which is more than at the variable mode by 159.8 kg or 3.57%. As a result, the cost of feed in the variable mode of the day per 1 kg of milk was 1.38 feed units, and at constant - 1.10 feed units, which is less by 0.28 feed units. or 20.3%. The constant daily routine reduced labor costs in milk production by 9.7%, and by 1 quintal of milk - 34.2%.

As a result, the economic feasibility of following a regular agenda is shown in table 2.

Table 2

Economic feasibility of using a constant daily routine in milk production, n = 10

Indicator	Routine		Constant in% to variable
	variable	constant	
Average hopes for 305 days of lactation, kg	4479	4639	103,6
Feed costs, feed units: - per 1 kg of milk	- 1,38	- 1,10	- 79,7
Labor costs, m/hrs. - at 1 c. milk	- 3,1	- 2,04	- 65,8
The average selling price of 1 kg of milk during lactation, UAH	6	6	-
Gross amount of milk produced during lactation, c	447,9	463,9	103,6
Revenue from sales of 90% of milk, thousand UAH	241,87	250,51	103,6
Costs of milk production, thousand UAH	227,54	198,56	87,3
Profit, thousand UAH	14,33	51,95	362,5
Profitability level,%	6,30	26,16	-

Table 2 shows that the economic feasibility of using a regular schedule for milking cows of the Ukrainian black-and-white dairy breed prevails over the variable schedule, with a profit higher by 37.62 thousand UAH. or 3.6 times with a profitability of 26.16%.

It was found that the duration of milking was only affected by violations of the daily routine, with a constant regime of cows milked better than in the regime with a violation of the schedule for technological or other reasons. The completeness of milk production of cows in the conditions of a constant mode for all periods of lactation prevails over indicators at a variable schedule therefore manual milking was within 1,20 - 2,15 kg, in comparison with variable - 1,84-2,44 kg.

These studies were conducted on the basis of a farm in a cowshed with loose housing of cows, which takes into account the hygienic parameters of the microclimate parameters (Table 3).

Table 3

Characteristics of the microclimate in the transition period during milking cows of Ukrainian black-spotted dairy breed, n = 6

Indicator	Norm	Parameters		
		November 2019	January 2020	March 2020
Premises for keeping and milking first-born cows				
Temperature, ° C	8-12	11,4±1,34	8,1±1,27	10,3±1,33
Relative humidity,%	70-80	74±6,62	77±8,53	79±7,48
Air velocity, m / s	0,3-1,0	1,1±0,03	0,5±0,01	0,7±0,01
Noise level, dB	до 70	50±12,47	52±11,43	59±12,55
Microbial contamination of the premises, CFU	До 60	37,8±5,38	47,2±8,62	62,1±9,71
The content of carbon dioxide (CO2),%	До 15	12,3±0,36	14,5±1,53	12,8±0,84
Ammonia concentration (NH3), mg / m3	До 10	9,2±0,62	10,7±0,38	9,6±0,35
Milking bloc				
Temperature, ° C	4-10	8,5±0,76	6,9±0,42	8,1±0,51
Relative humidity,%	60-75	64±4,32	68±3,78	74±4,41
Air velocity, m / s	1,0-2,0	1,2±0,02	1,0±0,01	1,4±0,01
Sound level, dB	до 70	59±4,32	70±5,41	58±6,39
Microbal muddiness of apartment, CFU	До 40	22,7±4,38	29,1±6,72	35,1±4,81
The content of carbon dioxide (CO2),%	До 10	4,3±0,01	5,2±0,01	4,8±0,01
Ammonia concentration (NH3), mg / m3	До 5	2,3±0,01	2,8±0,01	2,6±0,1

The data in Table 3 show that the indicators of the microclimate during the keeping of cows in the cowshed are within normal limits, except for the parameter of air velocity in November 2019 by 0.1 m / s higher than normal, microbial contamination - by 2 CFU (March) and concentration ammonia - by 0.7 mg / m^3 (January).

After all, when cows get used to the appropriate regime, the approach of milking time, the appearance of a master milking machine, the noise of milking machines triggers milk allowance in animals, so it is very important when milking particularly high-yielding

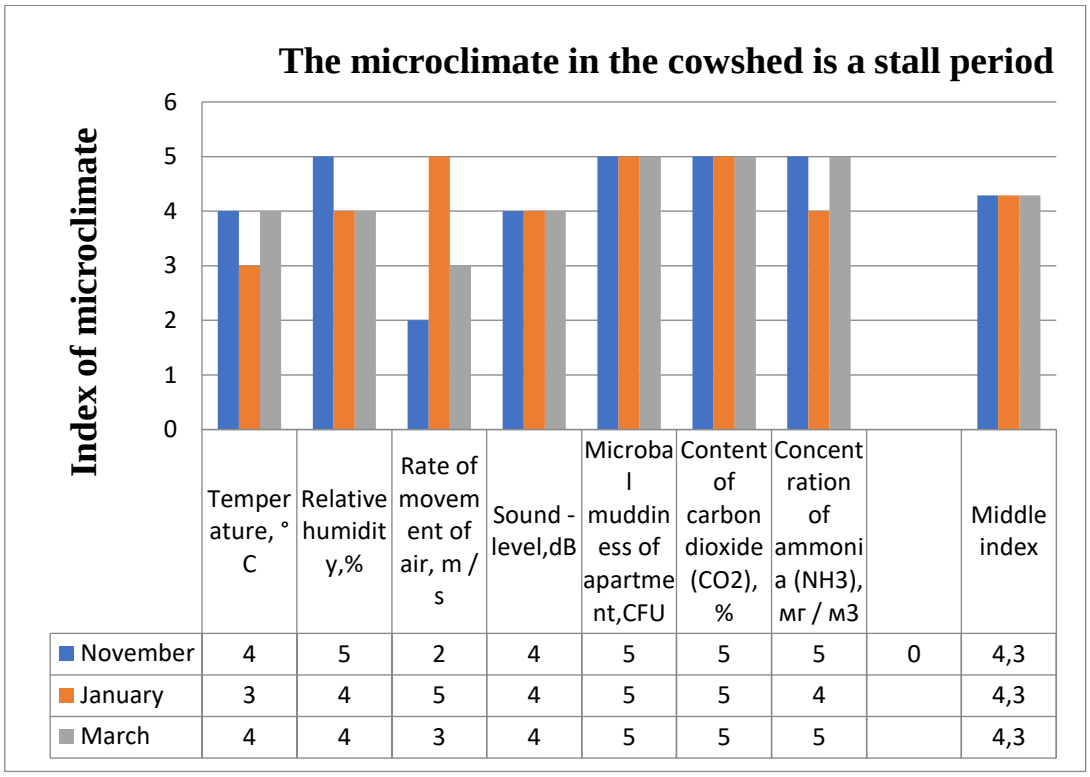
cows, which directly affects the daily routine on the farm.

Based on this, milk yield is affected by the daily routine, which depends on the time allocated for lactation of the cow and the time for milk production and time of milk excretion in accordance with the daily rhythm, which determines the accustoming of cattle to systemic milking at the same time of day. Therefore, the daily routine should be followed and put in the first place in comparison with the technological operations of feeding, watering, manure removal, etc.

Today, it is necessary to apply integrated and energy-saving technological solutions that correspond to the biological clock and acquired reflexes of the animal from which we receive milk and want to get healthy calves, which will rationally use the genetic potential of dairy cattle.

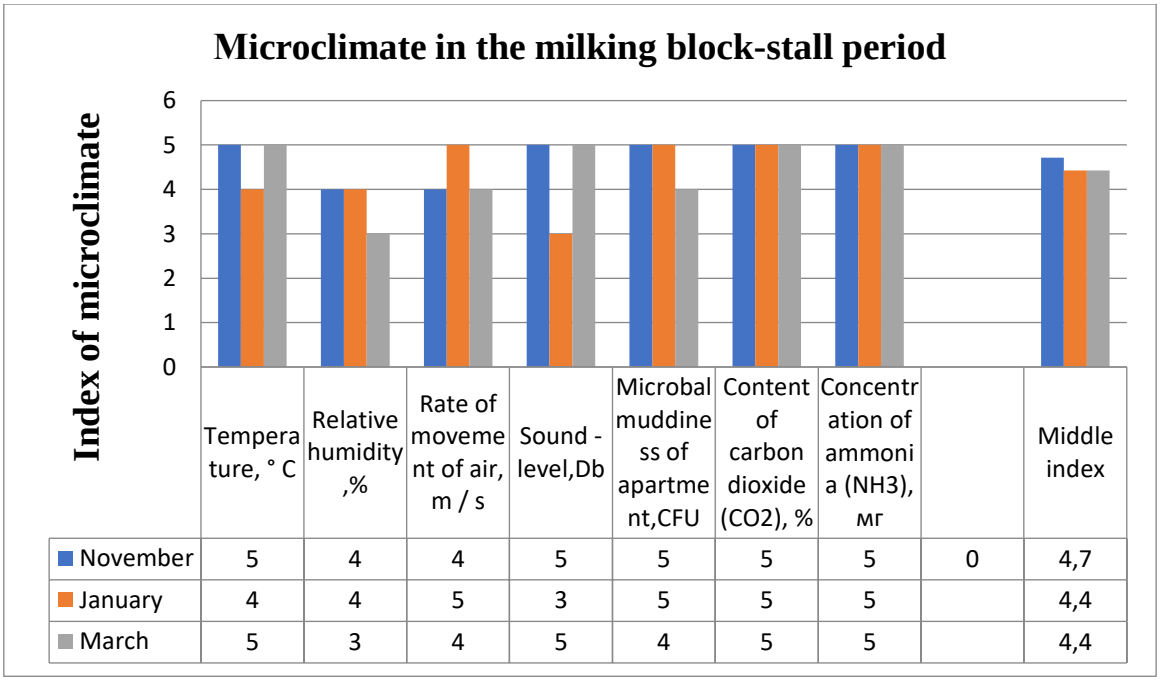
Indicators of the microclimate in the milking unit are within the allowable norm, which meets the technological requirements of milk production according to sanitary and hygienic requirements.

The total score is presented in Figurese 1 and 2



	Temperature, ° C	Relative humidity,%	Rate of movement of air, m / s	Sound - level,dB	Microbal muddiness of apartment,CFU	Content of carbon dioxide (CO2), %	Concentration of ammonia (NH3), мг / м3		Middle index
November	4	5	2	4	5	5	5	0	4,3
January	3	4	5	4	5	5	4		4,3
March	4	4	3	4	5	5	5		4,3

Fig. 1. Diagram of microclimate parameters in the cowshed - stall period



	Temperature, ° C	Relative humidity,%	Rate of movement of air, m / s	Sound - level,Db	Microbal muddiness of apartment,CFU	Content of carbon dioxide (CO2), %	Concentration of ammonia (NH3), мг		Middle index
November	5	4	4	5	5	5	5	0	4,7
January	4	4	5	3	5	5	5		4,4
March	5	3	4	5	4	5	5		4,4

Fig. 2. Diagram of microclimate parameters in the milking block - stall period

Thus, the sanitary and hygienic conditions of production of marketable milk in the conditions of FG "Shcherbych" correspond to the admissible design and technological regime - 4 points, at which milk production is slightly reduced by 5% compared to the optimal one.

By improving the operation of the ventilation system, and the drainage and manure removal system, the indicators of relative humidity, the content of harmful gases in the cowshed and the noise level in the dairy unit can be optimized.

Conclusions:

1.Sanitary and hygienic conditions for the loose method of keeping cows in the production of marketable milk in the conditions of FG "Shcherbych" p. The village of Lityn district corresponds to the allowable design and technological regime - 4 points.

2.Motor activity and clinical indicators such as: heart rate, depth of respiratory movements and body temperature of cows did not differ depending on the daily routine and milking regimens and corresponded to the physiological norm characteristic of this age group of cattle.

3.The economic feasibility of using a constant daily routine for milking cows of the Ukrainian black-and-white dairy breed prevails over the variable routine, while the profit is higher by 37.62 thousand UAH. or 3.6 times with a profitability of 26.16%.

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INFLUENCE OF BIODYNAMIC PREPARATIONS ON PHYSICAL PROPERTIES OF SOIL

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After harvesting crops, the density and hardness of the arable layer were determined from the physical properties of the soil. At the beginning of the research, the arable layer of sandy sod-medium podzolic soil was characterized by a high density, more than 1.40 g / cm3. When growing crops, the top 10 cm layer is most compacted under corn, up to 1.57–1.73 g / cm3, slightly less under cereals, up to 1.49–1.51 g / cm3.

Of all the biodynamic drugs used in 2013, only drug 500 was intended to improve soil structure and reduce its density accordingly. However, in the first year of its application in option 3, a significant decrease in the density of the topsoil relative to other options did not occur. Under cereals, the density of the top layer in this variant was 1.39–1.45 g / cm3, its values were lower in this variant relative to control and in crops of lupine and corn, which can only indicate a tendency to reduce the density of the top layer of soil on variant with combined use of biodynamic drugs №№ 500 and 501.

Re-determination of the density of the upper 10 cm layer after the end of the growing season in 2013 also shows a tendency to reduce it from the use of these drugs, on average from six fields of 3 options, from 1.39 to 1.37. This was more evident after the cultivation of buckwheat, where this figure decreased from 1.42 to 1.25. This decrease in density could be due to the use in 2013 of manure compost with biodynamic drugs for this culture. Less pronounced decrease in soil density was in other options to 1.32, 1.29, where buckwheat was also introduced such manure compost (options 4 and 5). In 2013, the upper soil layer was characterized