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SELECTION OF CATTLE BY PRODUCTION TYPES

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It was established that in order to accelerate the selection of the Ukrainian Black-and-White dairy breed, it is advisable to conduct selection by production types, where for milk production enterprises preference should be given to the dairy type of cows, which will reduce milk production costs by 8.1% compared to cows of close to dairy type and by 22.9% compared to cows of dairy-meat type. In addition, cows of production types differ significantly in live weight and milk production. Thus, cattle of dairy type by milk yield for 305 days prevails over animals of close to dairy type by 974 kg and dairy-meat type by 2297 kg, by fat content by 0.04 and 0.15% respectively.

The creation of control barns allows breeders to conduct targeted selection of cattle for the desired dairy type, where they are evaluated in the second or third month after calving on a point system.

Keywords: *breeding, constitution, Ukrainian black-and-white dairy breed, milk, body build, production type.*

Providing the population of any country with high quality food is a global problem of development of the international community. A special place in solving the food problem at the regional, national and global levels belongs to agriculture. That is why, ensuring a dynamic, stable and at the same time sufficiently effective development of the livestock sector is one of the urgent and urgent tasks of the economic policy of the young Ukrainian state [1].

Industrial methods of livestock breeding are aimed at breeding standardized animals in terms of productivity, live weight, exterior, constitution, technological features, etc.

Therefore, the selection of cows from breeding mothers is essential in the reproduction of the herd. But the mothers of the breeding nucleus must correspond to the dairy type of cattle. The most effective method is the selection of cows by linear evaluation because each exterior trait is closely related to the health of cows, reproduction, milk production and heredity. Selected cows in the breeding group should be provided with normalized feeding and comfortable conditions. In many countries with developed animal husbandry, breeding by lines in the established for domestic breeding science and practice understanding is not used now. A certain paradox is that the "crisis of the genre" is developing with the widespread introduction of the principles of large-scale breeding at the general breed level of its organization into breeding practice. The method of breeding by lines, which received in Western Europe a certain theoretical and practical development in the late XIX - early XX centuries, by the middle of the last century is losing popularity and recognition as a special method of breeding system. In Denmark, at the VI International Congress on Animal Husbandry in 1952, none of the speakers in the analysis and classification of methods of breeding farm animals does not distinguish

breeding by lines among the effective methods of factory work. Generalizing provisions "Modern views on breeding methods. Pure breeding and crossbreeding" noted the assessment of line breeding and the conclusion that it is impossible to recommend this method for widespread use due to the limited choice of outstanding sire. This point of view was generally recognized by foreign scientists. In recent decades, the main attention in the improvement of dairy cattle abroad has been paid to increasing the accuracy (objectivity) of the assessment of breeding value of sires and intensive use of identified bulls-leaders, rather than breeding by lines. Thus, in 1976 at the international conference in Sweden on the topic "Breeding of dairy cattle in the 80's" breeding by lines was not mentioned at all. However, the famous American scientist John F. Leslie even in the third edition of the textbook "Genetics of livestock improvement" (1978), which was published in Russian translation by D.V. Karlikov in 1982 under the title "Genetic basis of breeding of farm animals", not only recognizes the legitimacy and feasibility of using the method of breeding by lines in case of detection of a sire of high breeding value (first of all, by the quality of offspring), but also suggests the prospects for its wider use in the future [9, 10]. Defining inbreeding as a form of inbreeding (usually moderate), in which attempts are made to concentrate the heredity of one ancestor or one line of ancestors in linear animals, he illustrates different systems of inbreeding with five possible schemes of such inbreeding. In the given schemes it is supposed to use inbreeding from moderate, almost classical for breeding by lines of degrees. The latter scheme practically repeats the one actually applied by M.F.Ivanov when creating the Askania I line in the Ukrainian steppe white breed of pigs, the kinship of the proband (linear animal) with the ancestor is traced schematically by 2-4 lines against one in the outbred animal, therefore, according to J.F.Leslie, this method is called "breeding by lines" [1, 14].

Thus, despite the rejection of the majority of scientists in Europe and North America with developed animal husbandry, the method of breeding by lines is recognized by some of them as not only possible and expedient, but even promising and effective method of breeding improvement of populations of farm animals in the modern, focused on the maximum use of a limited number of sires-leaders of breeds of large-scale selection system. The genealogical analysis of the best modern breeds of North American and European breeding, which are improved by identifying and maximizing the use of sires-leaders of high breeding value in terms of offspring productivity, shows the use, perhaps unconsciously and not planned, of many elements of both classical and modern methods of breeding by lines [12].

Breeding is the science of breeding and improvement of breeds, types, herds, lines and families on the basis of selection, selection and use of various methods of breeding farm animals that contribute to the directed change of heredity of animals [13]. Livestock breeders have always sought to embody the individual qualities of highly valuable individuals in the group, that is, to get as many descendants as possible from them. Particular attention is paid to the role of individual heredity in the system of selection and selection in the creation of breeds, types, herds, lines and crosses [18].

In the conditions that have arisen in Ukraine as a result of the crisis, high-value

animals have not only a low degree of realization of genetic potential (in 1992 it was only 30%), but they also cannot function normally, that is, due to diseases and other reasons, they are prematurely withdrawn from the herd. At the same time, practice has shown that less valuable genotypes are more stable. Therefore, when selecting, special attention is paid to the interaction of genotype with the environment, that is, the phenomenon in which the best genotypes are more productive in better environmental conditions, and the worst genotypes are better in worse conditions [19, 21].

The most valuable cow is considered to be the one that gives good milk yields from year to year and has the ability to withstand high physiological stress during lactation for a long time, characterized by high milk production. But in order to use the animal more efficiently, it is necessary to identify its productive qualities as early as possible, so it is necessary to evaluate cows by the first lactation and even by segments of the first lactation. To quantify the milk productivity of cows for each lactation, the main measure is milk yield for 305 days and productivity, which is more correlated with lifetime milk yield, better characterizes the value of animals [22].

Cows are evaluated simultaneously by quantitative and qualitative indicators of milk productivity. Until recently, the main quantitative indicator was the fat content in milk, and now more attention is paid to the evaluation of protein content. The economic and especially breeding value of animals is determined by a combination of quantitative and qualitative indicators of milk productivity [26].

Milk productivity of cows is characterized by the quantity (milk yield, kg) and quality (composition, %) of milk obtained from a cow during the lactation period. Milk productivity varies in a fairly wide range: from 1000 to 25000 kg and more. These differences in shares are due to the conditions that affect the level of milk productivity, rearing of young stock, feeding, maintenance, level of selection and breeding work in the herd, breeding value of cows and bulls. The potential genetic potential of our domestic breeds is quite high, which is confirmed by the milk yields of cows in the best farms [27].

The genetic potential of productivity is determined experimentally, as well as on the basis of population genetic calculations in purebred and crossbred animals [16].

There are population, breed, group and individual genetic potential. Although local cattle have a much lower genetic potential, its actual potential under similar environmental conditions exceeds the level of productivity of crossbreds. That is, black and white cattle are more adapted to local environmental conditions.

Efficiency of evaluation of breeding qualities of livestock depends on well-organized accounting. Accounting of milk productivity is carried out by conducting control milking. On breeding farms they are held once a decade, on commercial farms - once a month.

The maximum daily milk yield for lactation in cows is observed in the second month of lactation and is approximately 1/200 of the milk yield for 305 days.

Milk fat content is determined once a month. For analysis, daily milk samples are taken from each milking in proportion to the milk yield. To calculate the average fat content in milk per lactation, the percentage of fat for each month is multiplied by

the milk yield. The result is 1% milk. Monthly data of 1% milk are summed up and divided by the milk yield per lactation. To determine the amount (kg) of milk fat, the sum of 1% milk must be divided by 100.

The essence of tandem (sequential) selection is that for several generations animals are selected for one of many traits. When a certain degree of expression of the trait is reached, the selection begins to be carried out for the second, then for the third trait. Thus, the herd can increase milk yield, fat and protein content in milk, improve the shape of the udder.

However, a comprehensive assessment of animals does not mean that a large number of traits should be used in the selection. Only the main indicators should be taken into account, which include productivity, strong constitution, fertility. the number of animals in the selection is often a decisive factor.

Livestock breeders have always sought and strive to embody the individual qualities of highly valuable cattle in the group, that is, to get as many descendants as possible from them. The improvement of herds and breeds of farm animals, as well as the transformation of their heredity in the desired direction is achieved mainly by selection and selection when creating breeds, types, herds, lines and crosses. As a result of purposeful selection of animals for several generations in the genotype of individuals there is an accumulation of genes that control a high level of productivity. In order to genetically improve the animals of a separate herd or breed as a whole, it is necessary to obtain offspring from the best economically useful traits of individuals and to remove animals with undesirable qualities from breeding. As a result of purposeful selection of animals for several generations in the genotype of individuals there is an accumulation of genes that control a high level of productivity [5].

3increase in the production of milk and dairy products is one of the important tasks of the agro-industrial complex of Ukraine, because milk provides the human body with all the necessary nutrients, minerals and biologically active substances and is one of the main human foods and raw materials for the production of various dairy products. In nature, there is no other product, except milk, which contains such an amount of nutrients, minerals, biologically active substances, is characterized by high digestibility, has a positive effect on the human and animal body. The importance of milk is also explained by the fact that it contains everything necessary for life, growth and development of the organism [2].

Large-scale breeding is a centralized system of scientifically based, breeding and genetic, biotechnical, organizational and economic measures that provide a systematic constant progress in a particular livestock population. It is based on a breeding program, which can be characterized as a technological organization of a phased assessment of the selection, selection and use of the best breeding animals, which allows to achieve the greatest genetic progress of the population at the lowest material costs of labor [2].

Large-scale breeding has set the following tasks: breeding new types and lines of animals resistant to diseases, which in the conditions of industrial livestock breeding becomes one of the main aspects of breeding aimed at creating herds capable of realizing high genetic potential of productivity [18].

One of the most effective methods of improving animals in purebred breeding is

breeding by lines. Its purpose is the development and consolidation of valuable features of the best animals in the descendants. It should be noted that the line is primarily a product of purposeful work of breeders. In the population of the black-and-white breed there are many modern lines and related groups connected by origin with the bull of the Dutch breed - the ancestor of the Annas Adema line. As a result of custom pairings, the following bulls-improvers were obtained and evaluated by the quality of their descendants: Vikumer 4086 LHV-268, Athlete 4098 LHV-379, Tins 1885 LHV-438, Futo 3 LHV-72, Mars 234 LHV-348. The productivity of their daughters during the first lactation ranged from 3864 to 4504 kg of milk with a fat content of 3.6 to 3.78% [2]. Currently, work is being done with these related groups to improve productive and breeding qualities. Along with breeding on lines, the system of purebred breeding includes work with families, which is to prevent the removal of heifers from the herd from highly productive cows until they are evaluated for their own productivity. When drawing up selection plans, it is necessary to analyze in detail the results of pairings of cows of one or another related group with bulls of certain lines.

Breeding and selection by families is one of the ways to solve the problems of increasing milk yield and fat-milk content of black and white cattle

The intensity of selection depends on the productivity of the mothers of the breeding nucleus and for effective selection - the mothers of the fathers. Preference should be given to purebred breeding, which allows to preserve the characteristics of mothers and fathers in many generations.

The lack of specialized enterprises for growing heifers today increasingly encourages producers to buy cattle in small batches, and from different farms for a long time, which negatively affects the selection and breeding work with the herd. The formation of a herd of animals of different genetic potential, age and adaptability to environmental factors does not contribute to high milk production of cows. Different conditions of feeding and keeping heifers in farms have an ambiguous effect on the acclimatization of animals, their behavior and future milk production. Commercial farms with milk production practically do not conduct selection for systematic and purposeful reproduction of herds and their breeding.

Thus, it is necessary to choose methods of selection of cows in the breeding core, which will be simple, accessible to specialists of agricultural enterprises and will not require significant material costs.

Therefore, it is advisable to select cows by evaluating their exterior, constitution, body measurements, body dimensions, body structure indices, special eyrosomia indices.

Based on this, the selection of cows by types of constitution is an integral part of advanced technologies for the production of livestock products.

Evaluation and distribution of cows by production types. Organization of reproduction and evaluation of sire bulls by quality of offspring is one of the most important elements of breeding programs in dairy cattle breeding. A multi-stage, intensive selection of sire bulls has been introduced. According to growth energy, body type and sperm quality, only 50% of the bulls are selected to complete the livestock of breeding enterprises [3].

When evaluating sires by only one indicator (milk yield of daughters) the number of bulls-improvers is about 25-30 %, by two indicators (milk yield, fat content in milk of daughters) up to 10-20 %. Thus, due to the intensity of improvement of breeding herds, the percentage of bulls-improvers decreases [15]. For the identification of one bull for breeding 8-10 bulls and more are selected. Therefore, there is a need to improve the work of the breeding service for the selection of the best cows in the breeding group that would meet such requirements.

One of the primary tasks of the breeding service is to improve the system of evaluation and selection of cows to obtain high production performance.

In the selection of dairy cattle, the evaluation and selection of cows in the breeding group in order to obtain high milk yields is of great importance. It is known that 20-30% of the total effect of selection is due to the correct selection of cows for reproduction of the herd. The size of the group is determined based on the culling of animals and extended reproduction [20].

Cows are evaluated and selected in a group of breeding mothers in three stages. At the first stage, the breeding value of the cow is estimated by milk yield and fat content in milk. At the second stage, the number of traits for selected cows according to these indicators is increased depending on the purpose of selection. At the third, final, stage, cows, in addition to these traits, are selected taking into account the reproductive capacity: cows should calve regularly, they should not have any cases of difficult births, dead calves, abortions and gynecological diseases. The age of first calving, inter-calving period, service period, duration of pregnancy, etc. [25].

Mothers of repair heifers should have high productivity indicators, known origin for at least four rows of ancestors and meet the following minimum requirements: milk yield not less than 150%, fat content in milk 0.2% higher than the breed standard (not less than 3.8%).

Under the same conditions, preference is given to mother cows belonging to highly productive families. As an additional source of information, data on milk productivity of the father's mother, mother's mother, etc. [3].

Obligatory for cows-mothers of repair heifers are: strong constitution, clearly expressed exterior, characteristic of dairy cattle, suitability for machine milking (udder bath or cup-shaped, with evenly developed lobes, teats of the correct shape, normally developed and placed, high milk yield). Calculations show that at high intensity of selection, taking into account these requirements, there is a shortage of the required number of mothers of repair heifers. Therefore, in milk production farms it is necessary to organize individual separation of cows to record indicators. Specialists of milk production farms select mainly young animals for breeding, which come from highly productive mothers with a clearly expressed milk type, good health, strong constitution and skeleton. Animals should belong to the elite and elite-record class.

It is known that the milk production of cattle depends on many genetic and paratypic factors. One of these factors is the production types of animals. Animals of any dairy breed in the direction of productivity can be divided into several types, and these types are inherent not only for breeds of combined crossbreeding, but also for dairy breeds. Selection taking into account one or another type makes it possible to

create highly specialized highly productive dairy herds or herds of animals that combine milk and meat productivity at a faster pace.

We aimed to study the exterior-constitutional features, live weight and milk production of cows of different production types of Ukrainian Black-and-White dairy breed. As a basis for differentiation of cows of this breed by production types, we use the index of production typicality. The grouping of animals by type is based on the deviation of 0.4 δ from the average value of the herd's IBT. According to this method, the herd of cows of the Ukrainian black-and-white dairy breed is divided into three production types - dairy, close to dairy and dairy-meat. The number of cows of these types was almost the same and is respectively 33.3, 31.1, 35.6% (Table 1).

Table 1 - Number and share of cows of different production types

№ type	Name of the type	Calculation method	Type parameters	Number of cows	
				heads	%
I	Dairy	> M+0,4δ	> 4,4	15	33,3
II	Close to dairy	M±0,4δ	3,6 - 4,4	14	31,1
III	Dairy and meat	< M -0,4δ	< 3,6	16	35,6
	Total	x	x	45	100

Table 1 shows that the parameters of the type are within the dairy direction of productivity not more than 4.4; close to dairy - up to 3.6, and dairy-meat - not more than 3.6. These data indicate that in this cattle population there are representatives of all types. Therefore, there is enough material for research, where out of 45 heads: dairy type 15, close to dairy type 14 and dairy-meat type 16. The exterior of dairy cattle is characterized by a well-developed middle third of the body, good development and morphologically correct forms of the mammary gland, angular body shape, correct posture of the limbs.

In cows of production types, there is a clear dependence of body structure features on the direction of their productivity. In particular, animals of dairy direction of productivity are characterized by good development of the trunk in height and length of the chest with relatively smaller latitudinal measurements, which is typical for animals of specialized dairy type (Table 2).

Table 2. - Body measurements of cows of different production types ($X^{-}\pm S^{-}$), cm

Name of measurements	Production types			By the herd
	I	II	III	
Height at the withers	135,2±0,6	132,1±0,6	132,8±0,5	133,4±0,3
Chest depth	68,8±0,8	70,8±0,3	71,50±0,5	70,4±0,4
Chest width	42,6±0,6	43,6±0,5	43,5±0,4	43,2±0,3
Chest circumference	202,2±1,2	200,2±1,2	200,3±1,0	200,9±0,6
Oblique length of the torso	170,8±1,5	165,9±1,3	164,8±1,0	167,2±0,8
Width in the clubs	50,9±0,7	52,0±0,6	52,7±0,5	51,9±0,3
Wrist circumference	20,0±0,1	19,8±0,7	20,2±0,1	19,9±0,2

Thus, the height in the withers of dairy cows prevailed over the animals of II and III groups by 2.4-3.1 cm, and by the withers - by 4.9-6.0 cm with a highly probable difference of p<0.01-0.001.

At the same time, they are inferior to animals of other types in chest width (0.9-2 cm), width in clubs (1.1-1.8 cm) with probable difference (Table 3).

Table 3. - Difference between groups of animals by body measurements, cm

Name of measurements	Difference and its probability					
	I-II		I-III		II-III	
Height at the withers	+3,1±0,8	3,9	2,4±0,8	3	-0,7±0,8	0,9
Chest depth	-2±0,8	2,5	-2,7±0,9	3	-0,7±0,6	1,2
Chest width	-1±0,8	1,2	-0,9±0,7	1,3	+0,1±0,6	0,2
Chest circumference	+2±1,7	1,2	+1,9±1,6	1,7	-0,1±1,6	0,06
Oblique length of the torso	+4,90±1,9	2,6	+6±1,8	3,3	+1,1±1,6	0,7
Width in the clubs	-1,1±0,9	1,2	-1,1±0,9	2	-0,7±0,8	0,9
Wrist circumference	+0,2±0,7	0,3	-0,2±0,1	2	-0,4±0,7	0,6

As shown by our calculated indices of body structure, cows of dairy type of productivity are characterized by higher indices: high-footedness, stretching and eyrosomia-lectrosomia (Table 4). According to these indices, they prevail over animals of dairy and meat production type by 3, 2.2 and 17.6%, respectively. At the same time, they were inferior to the animals of dairy - meat type by the index of bruising (compactness) by 3.1%, low-metric coefficient by 9.9%.

Table 4 - Body structure indices and overall dimensions of cows of different production types

Name of the indices, %	Production types			By the herd (n=45)
	I (n =15)	II (n =14)	III (n =16)	
High-footedness	49,1	46,4	46,1	47,2
Stretching	126,3	125,6	124,1	125,3
Pelvic-thoracic	83,7	83,8	82,5	83,3
Thoracic	61,9	61,6	60,8	61,4
Congestion	118,4	120,7	121,5	120,2
Massiveness	180,1	151,1	150,8	150,6
Bony	14,8	14,9	15,2	14,4
Erosomia-leptosomia	326,9	311,7	309,3	316,1
Malometric coefficient	110,2	120,6	120,1	118,1
Overall body dimensions, cm	508,2,	498,2	497,90	501,5

Overall body dimensions of dairy cows averaged 508.2 cm against 498.2 cm in animals of close to dairy and 497.9 cm in dairy-meat types. These data indicate that dairy cows have a more pronounced narrow body structure compared to animals of other types. This is evidenced by the data presented in Table 5.

As can be seen from the data in Table 5, the proportion of cows of narrow-

bodied type among animals of dairy productivity was almost half (47%), while in cows of close to dairy type this figure is 21%, and dairy-meat type - only 12%. That is, in the process of transition of animals from dairy to dairy-meat type, there is a radical change in their body structure in terms of parameters, which they are approaching the animals of the combined type, which are characteristic, for example, for individuals of the Ukrainian black-and-white dairy breed.

Table 5 - Distribution of cows examination by types of constitution

Name of the indexes, %	Production types						By the herd (n=45)	
	I (п=15)		II (п=14)		III (п=16)			
	heads	%	heads	%	heads	%	heads	%
According to the index of eyrosomy-leptosomy								
Eirosomal	7	47	3	21	2	12	12	27
Intermediate	5	33	5	36	8	50	18	40
Leptosomal	3	20	6	43	6	38	15	33
By mass coefficient								
Dense	3	20	6	43	7	44	16	35
Intermediate	7	47	5	36	5	31	17	38
Loose	5	33	3	21	4	25	12	27

At the same time, there is another tendency: with the transition of animals from dairy to dairy-meat type, the proportion of animals of dense constitution increased almost 2 times and the proportion of animals of loose type decreased. This pattern is due, in our opinion, to a significant deposition of internal fat in animals of the combined direction of productivity compared to dairy. This trend is clearly seen in the results shown in Table 6.

Table 6. - Live weight, milk yield, milk yield rate of cows of different production types ($X^{-}\pm S^{-}$)

Features, units of measurement	Production types			By the herd
	I (п=15)	II (п=14)	III (п=16)	
Live weight, kg	560±5,4	601±6,7	598±6,2	596±3,5
Milk yield for 305 days, kg	4928±85	3954±122	2631±90	3808±94
Fat content, kg	3,82±0,01	3,78±0,02	3,67±0,02	3,75±0,01
Milk fat, kg	188,2±3,5	149,5±4,8	96,5±3,3	142,8±4,1
Relative milk yield, kg	880±18,2	658±13,1	440±12,6	639±17,2
Milk yield rate, kg/min.	1,98±0,02	1,91±0,02	1,84±0,03	1,91±0,01

Despite the fact that cows of dairy type prevail over animals of close to dairy (II) and dairy-meat (III) types by overall dimensions, they were the lightest. The live weight of dairy cows was 560 kg, which is 41 kg less than that of cows of close to dairy type and 38 kg less than that of dairy-meat type with a highly probable difference ($p<0.001$).

Dairy cows were the most highly productive, this is natural. After all, the method of determining the production type of milk productivity of cows is an integral part of the mathematical model. The milk yield of dairy cows is 4928 kg of milk for 305 days of lactation, which is 974 kg more than animals of close to dairy type and 2297 kg more than cows of dairy-meat type with a highly probable difference ($p<0.001$) (Table 7).

Table 7 - Probability of difference between cows of different types

Features, units of measurement	The difference between the types ($X^{-}\pm S'_{x}$)		
	I-II (п=27)	I-III (п =31)	II-III (п=30)
Live weight, kg	-48±8,68	-38±8,2	+3±9,1
Milk yield for 305 days, kg	+974±148,7	-2297±123,8	+1323±151,6
Fat content, %	+0,04±0,02	+0,15±0,02	+0,11±0,03
Milk fat, kg	+38,7±5,9	+91,7±4,8	+53±5,8
Relative milk yield, kg	+222±22,9	+440±22,1	+218±18,8
Milk yield rate, kg/min.	-0,07±0,03	+0,14±0,04	+0,07±0,04

These data indicate the reliability and high efficiency of dairy cattle breeding using the presented methodological techniques. This direction in breeding makes it possible not only to sharply increase the number of cows with high and record milk yields, but also to radically change the type of their body structure, bringing it closer to modern standards of specialized world dairy breeds, in particular, such as Holstein.

As for the fat content in milk, its dynamics with increasing milk yield does not coincide with generally accepted and biologically sound laws. In particular, in the surveyed herd, cows of dairy type of productivity were more fat-milk. On this basis, they prevailed over animals of dairy and meat type by 0.15% ($p<0.001$).

Undoubtedly, the complex feature that characterizes cows is the amount of milk fat for 305 days of lactation. Since this indicator is determined mainly by the level of milk yield, the best cows were also dairy cows. Each animal of this type received 188.2 kg of milk fat for 305 days, which is 38.9-91.7 kg more than in cows of II and III types, respectively. In dairy farming, much attention is paid to such an indicator as the relative milk yield of cows. This feature is determined by 2 parameters - milk yield of 4% and live weight of cows. Often, relative milk yield is used as a criterion for differentiating cows in the direction of productivity. As shown by scientific research and experience of the best farms, the higher the relative milk yield of cows, the greater the proportion of feed nutrients used for milk production and less is spent as a maintenance amount of feed and vice versa. Thus, cows with a milk yield of 4000 kg of milk per lactation spend 0.8-0.9 feed units per 1 production, and with a milk yield of 2000 kg - 1.4-1.6 feed units. Therefore, this indicator characterizes not only the productive potential of animals, but also to some extent their economic efficiency. As can be seen from Table 7, the best in terms of relative milk yield were dairy animals.

For every 100 kg of these animals, 880 kg of milk was obtained. This figure does not yet reach world standards, in particular, the most productive Holstein breed.

But dairy cows significantly (by 222-440 kg) prevailed on this feature of animals of other types with a highly probable difference.

Modern milk production technologies set certain requirements for cows, in particular, an important technological feature of animals is the intensity of milk yield, with the increase of this feature increases labor productivity, and hence the load on the staff.

Our research shows that cows of different production types differ in milk yield rate. In particular, in animals of dairy type it was 1.98 kg/min. against 1.84 kg/min. in cows of dairy-meat type ($p<0.001$).

Consequently, the selection of animals by indices of production typicality makes it possible to better form highly productive dairy herds in the completion of animals with high potential of a dairy herd well adapted to the conditions of machine milking.

Features of creating a control barn for the manifestation of genetic traits in the daughters of cows of the breeding core. Increasing the production of livestock products, especially milk, is one of the main tasks of agricultural production. The success of its implementation depends on many factors, including the increase of the level of zootechnical work with dairy herds, the effectiveness of selection and breeding work, an important link of which is the control barns, where the first-born cows are bred and evaluated, the sires are checked for the quality of the offspring.

Introduced in the farm feeding of first-born heifers in specially allocated control barns proved to be an effective means of increasing cow productivity and milk production, accelerating the preparation of the herd for transfer to an industrial basis.

The high efficiency of the control barns is explained by the creation of improved feeding and housing conditions for first-born heifers [8, 11]. In addition, the most experienced specialists work in the control barns, which makes it much easier to establish and control the work on feeding the firstborn and create the necessary conditions for better preparation of heifers for lactation.

Feeding of first-born heifers in the conditions of control barns allows to select animals for replenishment of the main herd according to their actual productivity, which is more effective than selection only by pedigree. In the control barns, the productive and physiological signs of the firstborn heifers are studied, which characterize their suitability for machine milking.

Under the guidance of state breeding stations and artificial insemination stations in control barns, bulls are checked for the quality of offspring. The identification and widespread use of bulls that improve the productivity and suitability of daughters for machine milking allows to improve the breeding and commercial herds and breeds in general in a short time, to accelerate the transfer of dairy cattle breeding to an industrial basis.

The best premises equipped with modern means of mechanization of the main labor-intensive processes, especially milking, are allocated for control barns. The required number of places in the control cowsheds is determined by the annual need of the farm to replenish the main herd and the period of stay in the control cowsheds of heifers and first-born heifers.

Heifers are placed in control barns 3-4 months before calving to better prepare them for lactation. Productive heifers are kept here until the end of the first lactation.

Thus, the best animals stay in the control barns for 12-14 months. Some of the first-born heifers with low productivity are culled after 3-4 months of lactation, and therefore the average period of stay of animals in the control barn is one year. The number of places in the control barns is equal to the number of planned calving heifers during the year. In farms where less than 100 heifers are introduced into the herd annually, control groups are created in separate sections of existing barns [7, 15].

In order to accelerate the improvement of breeding and productive qualities of dairy cattle, farms increase the number of heifers raised to replenish the herd. Studies have shown that with the increase in the number of first-born heifers introduced into the herd, the efficiency of its improvement is constantly increasing. The maximum is reached with the annual introduction of 25-30 firstborns per 100 cows available at the beginning of the year. At the same time, milk productivity increases by 5-10% and meat potential of the herd by 10-15%.

In the control barns, heifers come from farms specialized in growing heifers, or from a specialized farm of their own farm. In some farms, heifers and heifers are raised on the same farm where the control barns are located, i.e. they create a specialized farm for raising heifers and heifers, feeding and checking the firstborn heifers.

When determining the required number of repair heifers and heifers, the level of culling of cows, the actual level of heifers' retirement during growing, planned tasks to increase the breeding stock are taken into account. If the number of cows in the farm does not increase, and 25% of first-born heifers are introduced into the herd every year, 10% of heifers are culled during rearing, at least 28 heifers per 100 cows must be left for repair. If the herd is introduced to the firstborn up to 30%, then repair heifers must have 33 for every 100 cows.

Heifers selected for herd repair are kept in good conditions, they receive feed according to typical feeding schemes and complete rations typical for the zone. Up to 4 months of age, they are fed 300 kg of whole milk, 600 kg of collected milk and other feed.

For the development of the gastrointestinal tract and the formation of milk signs, repair heifers are accustomed to eating a significant amount of rough and juicy feed. Heifers are kept untethered, grazed in summer, depending on the quality of the pasture, fed with green and concentrated feed. Heifers are inseminated at the age of 16-18 months when they reach 65-70% of the live weight of adult cows. It is believed that in commercial farms the minimum live weight at the first mating should be 320 kg for Simmental and Lebedinsky breeds, 300 - for Black-and-White, 290 kg - for Red Steppe and Red Polish breeds, which will allow to obtain cows that meet the requirements of the first class of development [6, 11].

At the 5-6th month of pregnancy, heifers are transferred to control barns, where they are accustomed to the existing technology on the farm, especially to the work of milking machines. From the 6th month of pregnancy, the udder massage is carried out. It is done by a milkmaid assigned to a group of heifers. Heifers are accustomed to massage by lightly stroking the udder in the 6th month of pregnancy for three minutes. Gradually bring the duration of udder massage to 6-8 minutes. Udder

massage is stopped two weeks before calving. Carrying out the massage in the experimental farm "Ukrainka" allowed to increase the expectations for the first-born cow by 388 kg compared to the first-born cows without udder massage. The labor costs of a milkmaid with a load of 25 heads of heifers during the massage increase by three hours a day.

Twice massage for 7-10 minutes from the fifth to the eighth month on breeding control farms of breeding plants and subsequent milking of the firstborn heifers contributes to an increase in milk yield during the first lactation by at least 500 kg per cow. In the first month (the sixth month of pregnancy) massage is performed at a strictly defined time, during the milking of cows. During udder massage, heifers are fed with concentrated feed. At first, the massage lasts three minutes, then its duration increases to 6 minutes each time. On the 6-7th month of pregnancy, udder massage with perfect processing of its lobes is carried out twice a day for 6-7 minutes. This contributes to the proper formation of glandular udder and teats. When massaging the udder, the blood supply to the mammary gland increases, which contributes to its more intensive growth.

10 days before calving, heifers are transferred to the maternity ward. Machine milking with a healthy udder is used from the first days after calving. In 10-15 days after calving in normal physiological condition animals are transferred to control barns, where control groups of first-born heifers are formed. Feeding heifers in the control barn is carried out in the same way as dry cows, taking into account the development of live weight and planned milk yield.

In the control yards, cows are fed according to the rations prepared by the farm's zootechnician twice a month. This takes into account the productivity of cows, their live weight and expected growth. In winter, the norm of roughage, silage and haylage in the daily ration is the same for all first-born cows. The norm of concentrated feed (mixed fodder) and root crops is planned depending on the level of milk productivity.

In the first days after calving [4, 6] hay and good quality silage are given in abundance. However, the full rate of concentrates and root crops is given at the end of the first week after calving. Restriction in feeding these feeds is a preventive measure against high mammary tension and possible udder inflammation.

If there is a danger of mastitis, then the firstborn is transferred to a full diet later (two to three weeks after calving). Cows should be transferred to normal feeding before they are milked.

In the summer, all firstborns are fed green mass as needed, and the rate of concentrated feed is regulated depending on the level of milk production. Balancing of the diet by nutrition is carried out by different amounts of mixed fodder and different mixtures of concentrated feed. In summer, cows should receive the maximum amount of green mass.

The structure of feed in the annual diet should be the same for the groups of daughters of bulls that are evaluated and include 45-55% of juicy and green, 20-30% of roughage and 25-30% of concentrated feed.

In the control barn there is an opportunity to feed the first-born heifers. For this purpose, in the first-third month of lactation, cows are advanced concentrated fodder and fodder beets until the firstborn increase milk yield. As the experience of many

agricultural enterprises shows, during lactation it is necessary to give 2-3 additional feed units in the first two months of lactation, and then 1-2 feed units.

When preparing diets for first-born heifers, in addition to advance feed for milking, feed for growth is additionally given on the basis of obtaining an average daily weight gain of 0.5 kg.

In control barns, where there are the necessary conditions, the technician takes into account the amount of feed fed by groups of cows of daughters of each bull. Concentrated feed is given by measures of a certain capacity (by weight). To take into account feed consumption, the technician conducts control feeding at least once a decade. On this day, rough and juicy feed is given by weight, and the next day the remains are weighed for morning feeding.

The amount of feed eaten per decade is determined by multiplying the number of feed actually eaten by the cow per day by the number of days in the decade.

Based on the log data, the monthly payment for feed in milk is determined. The calculation of the nutritional value of feed is made according to the tabular data taken from the reference book "Feeding standards and rations for farm animals". This takes into account the quality of the feed used, especially bulky feed - roughage and silage, according to the agrochemical laboratory.

On the days of control feeding, the technician takes average samples of rough and juicy feed to determine their moisture content. It is known that with an increase in the actual moisture content of feed (compared to the standard), their nutritional value is proportionally reduced.

Zootechnical accounting in control barns is carried out by laboratory technicians, primary accounting - by the farm manager.

The data of control milk yields and milk fat content are recorded in the act (form 6 mol.). After counting milk yields for the month and calculating the amount of milk fat, these indicators are recorded in the book of milk productivity (form 7 ml.).

In the control barns, cards of breeding cows, heifers (form 2 mol) are used, which are suitable for mechanized processing. They are kept by a zootechnician-breeder, who systematically updates data on live weight, mating, calving, productivity, etc. The cards are designed for the entire time of use of the animal.

The productivity indicators of the daughters of the evaluated bulls are recorded in a special journal (form 11 mol.), calculates the average indicators of daughters and peers. The evaluation results are sent to the state breeding station, which evaluates bulls. On the basis of the obtained materials, the category of the bull is established in accordance with the instruction of the MAP of Ukraine "Evaluation of bulls of dairy and dairy-meat breeds by the quality of offspring", after which its further use is determined.

The possibility of evaluating and selecting cows for the first lactation is confirmed by the data of a number of authors [12, 17] that the inheritance of milk yield for the first lactation is higher than for the following. Evaluation for the first lactation is based on the fact that there is a close relationship between the indicators for the first lactation and subsequent productivity. The correlation coefficient of milk yield with lifetime productivity ranges from 0.6-0.8. The repeatability of other traits is also quite high.

In the control barns, the productivity of the first-born heifers is evaluated by the following signs: milk yield for shortened or 305 days of lactation, fat and protein content in milk, udder shape, milk yield rate and milk distribution in udder lobes, payment for feed with milk.

To accelerate the evaluation of heifers by milk productivity and bulls by offspring, it is practiced to evaluate cows by milk productivity in the first three months of lactation by milk yield and in the fifth-sixth month - by the percentage of fat in milk. Economic calculations related to the sale of heifers at different ages show that already in the 3-5th month of lactation low-productive first-calf cows can be culled without losses [23, 24].

Milk yield is recorded three times a month by decade, fat and protein content in milk is determined once a month by a two-day sample.

The udder shape is evaluated by eye on the 2-3rd month of lactation in accordance with the methodological materials "Evaluation of udder and milk yield of dairy and dairy-meat cows". The shape of the udder is characterized by its length, width and depth. The shape is divided into tub-shaped, cup-shaped, rounded, narrowed and goat. Morphological features of the udder are evaluated in accordance with the new "Instructions for boning cattle of dairy and dairy-meat breeds" on a 5-point scale. The physiological properties of the udder are studied and its main measurements are taken.

To obtain high milk yields and successful milking with milking machines, it is necessary to have cows with a large, extended far forward and backward, wide, deep and glandular udder, tightly adjacent to the abdomen with symmetrical and evenly developed lobes.

The distance from the lower end of the udder teat to the ground should be at least 45 cm, the length of the teat is not less than 3 cm and not more than 9 cm, the diameter of the teat in its middle part is not less than 1.8 cm and not more than 3.2 cm.

The properties of milk yield are checked using an apparatus for separate milking of udder lobes. The duration of milking is determined by a stopwatch, starting from the moment the milking cups are put on (from the beginning of milk leakage) and until the end of milk yield, including machine milking.

When determining the properties of milk yield, the most important for machine milking are the following properties: milk yield rate and duration of milking; the ratio of milk yield from the front and rear udder lobes - udder index. The amount of milk obtained from the front lobes of the udder should be at least 40% of the total milk yield.

A dairy laboratory was created to record the quality of milk. Fat content is determined by the acid method (according to Gerber), protein content - by colorimetric method using orange "G" dye. These methods are described in detail in the "Methodological recommendations and guidelines for the evaluation of dairy cattle in breeding plants for protein content in milk".

According to economic conditions, standards of milk productivity for first-born cows are set for each year. During the year, the zootechnician determines the number of first-born heifers necessary for the herd, which ensures the fulfillment of the

established tasks for the initial number of cows, production and sale of milk to the state, and therefore a temporary deviation from the accepted standards is possible. The farm culls the firstborn cows that have not reached the highest daily milk yield of 10 kg, that is, they give less than 2000-2200 kg of milk per lactation. The firstborn with goat udder shape is also culled.

To determine the productivity of the first lactation, the laboratory technician conducts control milk yields, calculates the milk yield per decade and per month. During the second control milk yield, he takes the first part of the milk sample, repeats it the next day, analyzes milk for fat content from the sample of two-day milk yield, and after determining the monthly milk yield, calculates the amount of milk fat for the month.

After the cows stop milking due to calving, or if lactation lasts more than 305 days, the laboratory technician calculates the milk yield for the first lactation and the amount of milk fat, calculates the average milk fat content.

On the 2nd-5th months of lactation, the laboratory technician together with the farm manager organize weighing of the corresponding group of firstborn cows, on the 2nd-3rd months they evaluate udders and determine the suitability of firstborn cows for machine milking. At the same time, serial milking machines are used, which have inspection cones of the milking cup and allow to determine the milk yield during the milking of each udder lobe.

The exterior of cows is evaluated at 2-3 months after calving on a 10-point system, while separately indicating the points for the shape and size of the udder.

Veterinary and sanitary measures to preserve the health and productivity of animals. In order to prevent and eliminate animal diseases, protect people from infectious and invasive diseases common to humans and animals, it is necessary to provide a set of special measures at cattle breeding enterprises, including disinfection, deworming, disinfestation, disinsection, deratization, etc. The most effective and widespread measure for the destruction of pathogens of infectious diseases in the environment is disinfection, which is carried out after thorough mechanical cleaning of livestock premises.

The following types of disinfection are provided: preventive (planned, technological) and forced (current and final)

Preventive disinfection is carried out after the commissioning of the farm or a separate facility before filling the premises with animals, and in the future (in order to prevent the accumulation and destruction of pathogens) periodically depending on the production technology. Forced disinfection is carried out in farms, unfavorable for infectious diseases of animals, in order to localize the primary focus of infection, prevent the accumulation of pathogens in the environment and their spread on the territory of the farm and beyond. Current disinfection is carried out periodically throughout the entire period of rehabilitation of the farm (farm) in order to reduce the level of contamination of environmental objects with pathogenic microorganisms and reduce the risk of re-infection of animals on the territory of the farm (farm) and the spread of the disease beyond its borders. The final disinfection is carried out at enterprises after the elimination of an infectious disease (before the quarantine or restrictive measures are lifted) in order to completely free the focus of infection from

pathogens.

Disinfection is subject to premises for animals, equipment, inventory, animal care items, indoor air, territory of the enterprise, unloading and loading platforms, veterinary and sanitary facilities, vehicles, milking machines, overalls, manure, slurry and wastewater.

Preventive disinfection of the premises is carried out twice a year: in the spring after the transfer of animals to pastures and in the autumn before returning them to the stall. In the premises for fattening animals, disinfection is carried out after their delivery for slaughter and before completing new fattening groups.

Enterprises of industrial type with current-shop production technology, which operate on the principle of using the premises "all occupied - all empty", disinfect after releasing the premises from animals and transferring them to another workshop. If deep litter is used in the premises for animals, they are disinfected after removing the old and laying new litter.

In addition to scheduled preventive disinfection, technological disinfection is also used every month on sanitary days:

- carry out mechanical cleaning of production, domestic and auxiliary premises, equipment placed in them and the territory of the enterprise,

- contaminated areas of walls, partitions are washed with hot water, disinfected with 1.5 - 2.0% soda ash solution or ash alkali, etc. and bleached with lime. Before disinfection, the premises are freed from animals, manure, feed residues and litter are removed.

Dry manure, litter and garbage, in order to prevent the spread of infection, are moistened with water or disinfectant, after which the walls, partitions, feeders, floors are washed with water under pressure and the grates and manure channels are carefully freed from manure residues. After cleaning, the premises are disinfected using mobile or stationary disinfectors with appropriate chemicals in the form of solutions, suspensions, aerosols or gases.

The choice of disinfectants is carried out in accordance with the instructions for combating the disease that has arisen on the farm. If it is impossible to completely free the premises from animals, separate free sections or areas are disinfected with means that are harmless to animals.

In the presence of galvanized iron structures in the premises, preparations that lead to corrosion of structures should not be used.

Simultaneously with the disinfection of the premises, it is necessary to disinfect the walking areas where the animals were kept.

Before aerosol disinfection, it is necessary to free the premises from animals and feed, to carry out mechanical cleaning and sealing of the premises. During the period of aerosol disinfection, the air parameters in the room should be: temperature - at least 15 ° C, relative humidity - at least 60%. In 6-24 hours after aerosol treatment, the room should be ventilated, and the channels, feeders and drinkers should be thoroughly washed.

It is advisable to use bactericidal irradiators for disinfection of air in calving departments, preventive clinics, arenas, dairy, bacteriological laboratories. Bactericidal lamps should be at a distance of 15-20 cm from the disinfected surface,

the irradiation time of the surface is 3 minutes, and the irradiation time of utensils, tools and equipment is 10 minutes. In the entrance vestibules of livestock premises provide disinfectant mats. A recess 1.5 m long and 0.15-0.20 m deep is provided in the floor of the vestibule for its entire width and filled with sawdust or foam rubber and saturated with disinfectant solution. Heated disinfection barriers are filled with the appropriate disinfection solution, and 10-15% of sodium chloride is added to the solution to prevent freezing.

Disinfection of special vehicles (cattle trucks, vehicles for transportation of slaughter products, etc.) is carried out after preliminary cleaning and washing with disinfectants or aerosols. Wastewater should be discharged for further cleaning and disinfection. Workwear should be disinfected by boiling or in steam chambers with appropriate solutions for at least 90 minutes.

For cleaning and disinfection of premises and technological equipment, water consumption at a temperature of 55-65 ° C should be provided at the rate of 15 liters / m of the surface (floor and walls) to be treated. Other veterinary and sanitary measures (dehelminthization, disinsection, deratization, etc.) are carried out in accordance with the veterinary legislation of Ukraine.

Prospects for the use of research results. In the context of Ukraine's accession to the WTO, in addition to increasing livestock productivity, it is advisable to take measures to improve the conditions of feeding and keeping dairy cattle.

It is important to combine the achievements of breeding work with measures for normalized feeding with high quality feed. In the production premises to constantly maintain hygienic conditions of a comfortable microclimate.

The operation of livestock buildings should be carried out in compliance with official regulations (Departmental norms of technological design of cattle-breeding enterprises, put into effect on January 1, 2006).

Conclusions

1. Cows of the Ukrainian Black-and-White dairy breed are heterogeneous in terms of production types, i.e. the direction of productivity. The surveyed cows belong to three production types: dairy, close to dairy and dairy-meat, the weight of which in the herd is almost equal and varies within the types from 31-36%.

2. Production types differ in linear dimensions of the body. The largest in these dimensions are dairy cows. The difference between the extreme types in height at the withers, chest girth, oblique length of the body is significant and statistically significant for the first and third measurements ($P<0.01$-0.001). By latitudinal measurements, dairy cows are inferior to animals of other types, especially dairy and meat type.

3. By indices of body structure, dairy cows are close to the exterior-constitutional type, which is characteristic of specialized dairy breeds, in particular Holstein. Compared to other types, they have higher indices of high leggedness, stretching, eirosomia – leptosomia and much larger overall dimensions, namely: 49.1; 126.3; 326.9; 508.2 against respectively 46.1; 124.1; 309.3; 497.9 in dairy-meat cows.

4. Evaluation of cows by two methods (by the index of eyrosomy-leptosomy and by the metric coefficient) showed that in the total herd the index of eyrosomy was

established in 27% of cows, and dense – 35%. Intermediate type – 40%, 30% respectively; leptosomy – 33.6%, loose – 27%. Therefore, it is possible to use each of these techniques in breeding with cattle.

5. Confirmation of the belonging of cows of dairy production type of body structure of animals of specialized dairy breeds is their distribution by the index of eirosomia-lectosomia. If among dairy cows 22% of animals belong to the narrow-bodied type of constitution, and 8% - to the broad-bodied type, then among animals of the dairy-meat type, respectively, 7% and 18%.

6. Cows of production types differ significantly in live weight and milk production. Cows of dairy type by milk yield for 305 days prevail over animals of close to dairy type by 974 kg and dairy-meat type by 2297 kg, by fat content by 0.04 and 0.15% respectively.

7. The creation of control barns allows breeders to conduct targeted selection of cattle for the desired dairy type, where it is evaluated in the second or third month after calving on a point system.

8. Veterinary and sanitary measures are aimed at preserving the health and productivity of animals, where the measures are based on all types of disinfection, cleaning of manure, litter and garbage. Measures are proposed for air disinfection, equipment of disinfection mats at the entrances to buildings.

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