

EXTERIOR FEATURES OF HOLSTEIN BREED COWS DEPENDING ON OF THE ORGANISM FORMATION TYPE

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Exterior features of the Holstein breed cows depending on the formation of the body were researched. A proportional and harmonious body structure that corresponds to milk productivity was found, though there was some difference among experimental types. Thus, the cows that had a fast formation of the body type were more compact than the cows of the same age that had slow rate of growth and characterized by a massive body.

Keywords: an intensity of formation of the organism, the Holstein breed, an exterior, measurements, indices of the body structure.

Identifying of desired type constitution features of animals plays a great significance in improving its productive qualities. Then a special role is given to the exterior and the constitution of an animal. The proper assessment and analysis of frame features are needed to get and determinate genetic goals of an animal.

Widespread implementing of intensive technologies explains increasing of requirements for the exterior and the constitution, especially for the quality of the udder and limbs.

Cows should be convenient to machine milking, have a strong constitution and good reproductive ability along with their high potential milk production. Great importance in deriving these animals belongs to the optimization of their constitutional exterior-type, which is closely associated with useful traits of milk-purpose cattle [1,3,4].

It is known that the type of body structure of animals (as well as any other trait) is formed as a reaction norm of genotypes to environmental conditions (Paratype factors) in constant interaction of these factors during ontogenetic development [5]. Therefore, we have set the **goal** to research the effect of intensity of the formation of the organism on body structure indexes of full-aged cows of the Holstein breed during the postnatal ontogenesis.

Materials and researching methods. Research of exterior of Holstein breed cows was carried out on the basis of materials zootechnical and pedigree accounting in the JSC "Agro-Soyuz", Dnipropetrovsk region. Groups of animals of different body formation types were created on the principle of even-aged counterparts. The animals were divided into two types of intensity of formation of the body (index data Δt) in accordance with the V.P. Kovalenko's methodology [2]. The average data was taken as a control group. We used data of 103 cows. The

evaluation of the exterior was made using main measurements (height at withers, oblique body length, chest depth, width of chest, chest girth, circumference of metacarpus, the width of the hip joint) and indices (current weight index, size index, thickness index, bony level index, thoracic index, leg-length index) using the software "Orsek."

Results. As it was found, the body fast formation type cows have the 1.06% bigger height at the withers (142 cm) than the opposite type of growth cows (140.5 cm), which yield the animals of the control group in 0.7 cm (Table. 1).

Table 1

Linear measurements of Holstein cows depending on the type of the organism formation intensity, cm.

Linear measurement	Type*	n	Level of a feature increasing , its variability and probability		
			$\bar{X} \pm S_{\bar{x}}$	$C_v, \%$	$d \pm S_d$
Height at withers	Fast	45	142,0 \pm 0,60	2,81	-0,9 \pm 0,78
	Slow	58	140,5 \pm 0,77	4,20	0,7 \pm 0,93
	Control	103	141,2 \pm 0,51	3,67	×
Oblique body length	Fast	45	160,6 \pm 1,12	4,69	0,7 \pm 1,34
	Slow	58	161,9 \pm 0,95	4,45	-0,6 \pm 1,19
	Control	103	161,3 \pm 0,72	4,55	×
Depth of chest	Fast	45	69,5 \pm 0,60	5,83	0,4 \pm 0,72
	Slow	58	70,3 \pm 0,53	5,73	-0,3 \pm 0,66
	Control	103	69,9 \pm 0,40	5,77	×
Width of chest	Fast	45	43,2 \pm 0,64	9,95	0,3 \pm 0,80
	Slow	58	43,7 \pm 0,68	11,83	-0,2 \pm 0,8
	Control	103	43,5 \pm 0,47	11,02	×
Chest girth	Fast	45	202,8 \pm 4,17	13,81	0,8 \pm 4,58
	Slow	58	204,3 \pm 0,85	3,18	-0,7 \pm 2,06
	Control	103	203,6 \pm 1,88	9,35	×
Circumference of metacarpus	Fast	45	20,2 \pm 0,35	11,60	0,2 \pm 0,42
	Slow	58	20,7 \pm 0,32	11,69	-0,2 \pm 0,39
	Control	103	20,5 \pm 0,23	11,64	×
Width of the hip joint	Fast	45	55,8 \pm 0,60	7,26	0,1 \pm 0,70
	Slow	58	56,0 \pm 0,40	5,46	-0,1 \pm 0,53
	Control	103	55,9 \pm 0,35	6,28	×

Note.* - organism formation intensity type

An important feature that characterizes the development of body of cows is its length, which is expressed by the oblique body length measurement. High values of this index of body structure refer to cows with the slow formation of the body intensity – 161,9 cm. These cows are different to the control group (161,3) at 0,6 cm. And cows with the fast growth type have the lowest levels of this trait – 160,6 cm and their difference with the opposite type is 0,8%.

The analysis of exterior measurements calculations that characterize the development of chest is the following. Chest depth as well as width and girth of the

chest demonstrates the same exterior similarities in the types of formation of the body of cows of the Holstein breed. Namely, cows with the fast formation of the body type have lower values of these features – 69,5; 43,2 and 202,8 cm respectively, the difference with the control group is from 0,3sm to 0,8sm in favor of the last one. However, the increase of these parameters is from cows with the fast growth intensity – 70,3; 43,7 and 204,3 cm, respectively, as its advantage over the control animals at 0,2sm0,7 cm.

An important feature of the exterior is the circumference of metacarpus, which reflects the level of development of the skeleton as a whole. Thus it was found that the same age cows with the slow growth have higher rates of the value of this index – 20,7 cm, which is larger than the value of the control group by 0,2 cm and smaller than the rate of the rapid formation of the body type intensity at 0,2 cm which is characterized by metacarpus circumference as 20,2 cm.

A similar trend is observed in the types of formation of the organism relatively to width of the hip joint. The cows with the fast development type (55.8 cm) concede in this feature to cows of two other research groups at 0.2 and 0.1 cm, respectively (the slow type – 56,0 cm and the control group – 55,9 cm).

Thus, it was found that cows with the slow formation of the body type have generally the advantage over the cows with the fast formation of the intensity of the body in main measurements of the body structure. Perhaps this is due to individual characteristics of the cow cattle.

It was found in the main indices of cow body structure that both research groups of animals remain proportional and harmonious body structure that corresponds to milk-purpose production type, although there was a definite difference between types researched.

Thus, according to the index of length of leg, the advantage is in favor of cows with the fast formation of the body type (51,1%) to the opposite group (0,2%), and to the control group (49,9%) 0.7%. This says about better sophistication of the cows with the fast type of growth in height, compared to the cows with the slow growth rate (Table. 2).

Table 2

Indices of body structure of Holstein cows of different types depending on the intensity of the formation of the organism, %

Body structure index	Type	n	Level of a feature increasing , its variability and probability		
			$\bar{X} \pm S_{\bar{X}}$	$C_v, \%$	$d \pm S_d$
1	2	3	4	5	6
Leg-length index	Fast	45	51,1±0,37	4,92	-0,7±0,50
	Slow	58	49,9±0,49	7,55	0,5±0,59
	Control	103	50,4±0,33	6,58	×

Part of the table 2

1	2	3	4	5	6
Current weight index	Fast	45	126,5±2,67	14,17	0
	Slow	58	126,4±0,86	5,19	0,1±1,52
	Control	103	126,5±1,26	10,09	×
Bony level index	Fast	45	14,2±0,24	11,34	0,3±0,30
	Slow	58	14,7±0,26	13,31	-0,2±0,31
	Control	103	14,5±0,18	12,57	×
Size index	Fast	45	113,1±0,77	4,57	1,3±1,06
	Slow	58	115,5±1,13	7,43	-1,0±1,34
	Control	103	114,5±0,72	6,42	×
Thoracic index	Fast	45	62,2±0,78	8,43	0,1±1,01
	Slow	58	62,3±0,97	11,88	0,0±1,16
	Control	103	62,2±0,64	10,47	×
Thickness index	Fast	45	142,9±2,95	13,84	1,6±3,26
	Slow	58	145,6±0,93	4,85	-1,2±1,67
	Control	103	144,4±1,39	9,76	×

The cows with the fast development type have higher features of the current weight index than the features of the same-aged cows with the slow development type by 0,1% and have the same level of its development with the control group – 126,5%. In turn cows with slow formation of the body have the current weight index at 126.4% that is 0.1% lower than the control group value.

The level of the bony level index performs a different trend corresponding to the types of the body formation intensity. Thus, cows with the fast development is characterized by lower values of the index – 14,2%, which is 0,3% lower than the control value. In contrast, the same-age cows with the slow development type have a higher bony level index – 14,7%, which is 0,2% different from control value. A similar level of measurements of body structure Holstein breed is observed in the size index, thickness index and thoracic index. Thus the cows with the slow body formation intensity have higher values of these indices – 115,5; 145,6 and 62,3%, respectively. While the same-aged cows of the opposite type, in contrast,

are characterized by a decrease of the abovementioned indices – 113,1, 142,9 and 62,2%, respectively.

Thus, the unique advantages of the indices of the body structure of animals for the benefit of any type is not set. Since the cows with the fast body formation intensity are found as more compact, while the same-aged cows with the slow body formation intensity is characterized by a more massive body.

Conclusions

1. It is found that the cows with the slow formation of the body type generally have a tendency of an advantage over the cows with the fast formation of the intensity of the body. Perhaps this is due to individual characteristics of the cow cattle.
2. Analysis of calculations of exterior measurements that characterize the degree of development of thorax: chest depth, width and girth of the chest show the similar exterior similarities in the types of formation of the body. Namely, the cows with the fast formation of the body type have lower values of these features - 69.5; 43.2 and 202.8 cm, respectively.
3. It is found that both groups of researched animals have proportional and harmonious body structure for the main indices of the cows body structure that corresponds to milk-purpose production line, but the cows with the fast body formation intensity are found as more compact, while the same-aged cows with the slow body formation intensity is characterized by a more massive body.

Researching the milk production of cows of Holstein breed that refers to different types of the body formation is to take place in further researches.

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