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**GROWTH AND DEVELOPMENT PECULIARITIES OF HEIFERS
WITH DIFFERENT GENOTYPES IN CONDITIONS
OF LLP «AGROFIRMA«DINARA-RANCH»**

Abstract. The article presents the results of the influence of paratypic factors on the variability of the live weight of heifers in all age periods in different genotypes of beef cattle breeds. Also in the article is given the comparative estimation of variability of live weight and intensity of growth and development of young animals from birth to 20 months of age of Kazakh white-headed, Hereford breeds and their hybrids.

Key words: growth, development, breed, Hereford, Kazakh white-headed, live weight, young, measure, index, increment, heifers.

Introduction. For Kazakhstan a favorable market situation develops, allowing to significantly increase the export of meat to foreign markets. This is due to the presence of such natural competitive advantages of the country, as favorable natural and climatic conditions, the availability of pastures (180 million hectares), the proximity of large sales markets. In addition, livestock is the native craft of the indigenous population.

The level of meat production and the quality of meat products of animals is determined by their genetic potential and environmental conditions: mainly by the level of feeding and technology of maintenance [1, 3].

In modern conditions of management, the receipt and rational use of highly productive animals is a promising direction in the development of beef cattle breeding. A topical issue is the development of methods for feeding young animals using cheap feed of natural pastures. The greatest effect can be obtained with pasture fattening of the young stock. In beef cattle breeding, the intensity of growth and development of young animals is one of the most important criteria for working on improving the breed, since, in the final analysis, determines meat productivity and is the main breeding feature.

Cattle type meat combines well the growth and fattening, much earlier than the animals of the dairy and combined directions reaches the delivery condition and at a younger age gives ripe meat. The process of animal growth is influenced by numerous genetic and non-genetic factors that manifest themselves both in the prenatal and postnatal periods of development, affecting both the level of meat productivity and the quality of beef [1].

In the production of beef in beef cattle breeding, two stages can be distinguished: the cultivation of calves on the suck-in and after the post-weaning period. This is the most acceptable and characteristic for the industry way of cultivation, ensuring the safety of the livestock of newborn young and its productivity. In the farms determined the pedigree assignment by age, the growth and development of the young, its evaluation and the class of parents [2].

Methods of research. The object of the study was cattle of meat direction, owned by LLP «Agro-firma«Dinara-Ranch» of Balkhash district, Almaty region. Animals were imported from the northern regions of Kazakhstan (Kazakh white-headed-KWH), from the USA and Canada (Hereford-HF). Three groups were formed: I group - KWH, II group - HF, III group of cross-breeding (F1). Evaluation of

growth and development of heifers is carried out based on the results of studying the parameters of live weight in different age periods, the average daily weight gain, the relative growth rate in individual age periods and the definition of the coefficient of increase in body weight with age.

The youngest in terms of age, the following measurements are determined: height at the withers, height in the sacrum, oblique length of the trunk (stick), chest girth behind the shoulder blades, chest depth, width of the chest behind the shoulder blades, width in makhloks, girth of the pastern. On the basis of measurements, the indexes of their physique are calculated: long-length, stretched, tazogrudnoy, thoracic, knocked down, overgrown, bone, massive, meaty, broad-cubed, compact [3, 4].

Results of the study. In this regard, we carried out a comprehensive assessment of the economic and biological characteristics and meat productivity of heifers of the Kazakh white-headed (group I), Hereford (II group) and their hybrids (Group III $\frac{1}{2}$ Hereford x $\frac{1}{2}$ Kazakh white-headed) for feeding and final intensive stabling.

The data obtained by us on the growth and development of heifers of different genotypes indicate that the animals of the experimental groups, at all stages of growing under the influence of the external environment, reacted unequally to changing conditions. This caused intergroup differences in the indices of live weight in different periods of ontogenesis (Table 1).

Table 1 – Dynamics of live weight heifers, kg

Age, month	Group					
	I		II		III	
	$(\bar{X} \pm m_x)$	C_v	$(\bar{X} \pm m_x)$	C_v	$(\bar{X} \pm m_x)$	C_v
Newborns	25,1±0,56	8,35	28,5±0,69	9,10	27,4±0,83	10,49
4	96,5±3,14	12,19	112,8±4,01	13,32	108,5±3,42	10,92
6	158,2±3,39	8,03	179,4±5,29	11,03	174,0±5,48	10,91
8	195,1±3,49	6,69	218,2±6,09	10,44	220,5±6,09	9,56
12	278,0±5,43	7,31	308,7±7,76	9,40	314,8±8,40	9,25
15	324,9±5,31	6,11	360,8±9,50	9,85	374,1±9,24	8,56
18	374,6±6,40	6,39	415,4±11,87	10,06	427,8±10,38	8,40
20	410,1±8,32	6,73	455,3±13,93	10,15	469,6±15,56	9,94

At the same time, it was established that the heights of the Kazakh white-headed breed differed by the minimum level of live weight at birth, which is their pedigree sign. So, they were inferior to hereford girls in terms of the studied indicator by 3.4 kg (13.5%, $P < 0.05$), the impurities – by 2.3 kg (9.2%, $P < 0.05$). In the Hereford and Pomeranian young animals, the difference in live weight at birth was insignificant (1.1 kg) and statistically unreliable. Thus, the heterosis of the live mass did not occur, and only the intermediate inheritance of the studied indicator was noted.

At 6 months of age, the crosses exceeded the female white-headed breeds by 15.8 kg (10.0%, $P < 0.01$), but less than Hereford (5.4%) (3.1%, $P < 0, 05$).

In the post-weaning period, when growing under the same conditions of feeding and content, the prevailing influence of the genotype on the manifestation of meat qualities was noted. Since the age of 8 months, a manifestation of heterosis on the live weight has been established. At the same time, the heterosis index at this age was low and was 101.1%, at 12 months. – 101,9%, in 15 months. – 103.7%, in 20 months. – 103,1%, and in 22 months. - 102.1%. An insignificant amount of heterosis in the living mass is due, in our opinion, to the breeds participating in the crossing. Heifers of Kazakh white-headed breed differ relatively low living weight, precocity, in comparison with the other two groups. It should be noted that at the age of 12 months they were less than 30.7 kg (11.0%, $P < 0.01$), 36.8 kg (13.2%, $P < 0, 01$), at 15 months. respectively, 35.9 kg (11.0%, $P < 0.01$) and 49.2 kg (15.1%, $P < 0.001$), at 18 months. – 40.8 kg (10.9%, $P < 0.01$), and 53.2 kg (14.2%, $P < 0.01$) and 20 months. – 45.2 kg (11.0%, $P < 0.001$) and 59.5 kg (14.5%, $P < 0.001$).

It is known that the average daily gain of live weight is an important indicator, by the magnitude of which one can judge the intensity of growth of an animal. The data obtained by us testify to certain intergroup differences in the intensity of growth already in the suckling period (Table 2).

Table 2 – Average daily increase in live weight of heifers, g

Age period, months	Group					
	I		II		III	
	$(\bar{X} \pm m_x)$	C_v	$(\bar{X} \pm m_x)$	C_v	$(\bar{X} \pm m_x)$	C_v
0-6	739±16,13	8,16	838 ± 25,88	11,57	814 ± 26,25	11,17
6-8	666± 14,81	8,33	718 ± 18,87	9,81	782 ± 23,40	10,36
8-12	521 ± 6,74	4,84	579 ±25,68	16,67	659 ± 15,34	8,07
12-15	550±19,00	12,92	607 ±35,33	21,49	597 ±18,75	10,88
15-18	595 ±26,17	14,39	665 ± 26,54	12,94	697 ± 29,76	12,21
18-20	393 ± 31,38	26,42	417 ±56,19	49,20	433 ±77,15	53,42
6-15	617 ±9,31	5,64	672±18,71	10,42	741 ±18,32	8,56
6-18	601 ± 9,88	6,15	656 ±18,70	10,67	705 ± 16,26	7,99
6-20	586 ± 3,80	4,99	641 ± 14,18	7,32	686 ±15,69	6,91
0-12	703 ± 13,89	7,40	778 ± 20,31	9,76	798 ±21,60	9,37
0-15	666 ± 10,82	6,08	738 ±20,17	10,22	770 ±19,15	8,61
0-18	647±11,01	6,37	716 ±16,62	8,51	741 ± 18,03	8,43
0-20	642 ± 11,43	5,83	711 ±22,32	10,40	737 ±24,47	9,98

The Heifordian heifers were distinguished by the maximum value of the indicator studied. So, their advantage on the average daily gain of live weight over the contemporaries of Kazakh white-headed breed in the period from birth to 6 months. was 99 g (13.4%, $P < 0.05$), and the interference was 24 g (2.9%, $P < 0.05$). These differences are due to the higher milkiness of the Hereford cows.

After 6 months of age in the post-withdrawal period, due to the stressful state of the young in connection with weaning from mothers, the intensity of growth in animals of all groups decreased. And in a greater degree it was typical for purebred hereford heifers. Thus, the decrease in the average daily gain of live weight in them was 120 g (16.7%), while in the hybrids 32 g (4.1%), heifers of Kazakh white-headed breed 73 g (11.0%). This is due, apparently, to the less stress-resistant of Hereford cattle.

In the post-withdrawal period, the manifestation of heterosis by growth rate was noted. At that, the index of heterosis on the indicator under study in the period from 6 to 12 months. was 113.8%, from 15 to 18 there was an intermediate inheritance of the trait, and from 18 to 20 months. the heterosis index was 104.8%, from 6 to 22 months. – 105.1%, and from birth to 22 months. – 102.5%. It is known that studying the exterior characteristics of an animal by taking body measurements and calculating body indexes allows one to judge its development, constitutional features and, to some extent, its productive qualities.

However, in meat cattle breeding this is of great importance, especially in regions with a sharply continental climate. Only with the use of well-developed, constitutionally strong animals can it be possible to achieve effective management of the industry [7, 8].

Our studies have already established new differences in the newborn youngster. The maximum value of all the measurements were Heifordian heifers, and the minimum – Kazakh white-headed contemporaries, the crosses occupied an intermediate position, approaching the main measurements to Hereford. It is enough to note that heifers of Hereford breed exceeded Kazakh white-headed girls in height at withers by 4.1 cm (5.6%, $P < 0.01$), height in sacrum 5.4 cm (7.1%, $P < 0.001$), the oblique length of the trunk is 3.9 cm (6.2%, $P < 0.01$), the girth of the chest behind the blades is 6.5 cm (9.4%, $P < 0.001$), the girdle is set to 3.2 cm (7.1%, $P < 0.01$).

Differences in depth and breadth measurements, breadth in maklocks, hip joints and sciatic tubercles, girth of the pastern, oblique length of the task were insignificant and statistically unreliable. A similar pattern persisted at 6 and 12 months of age. From the age of 18 months, there was a tendency for excellence in the individual measurements of the young stock. At the same time, the advantage of hybrids over Herefords was minimal, while Kazakh white-headed contemporaries were much inferior to them. At the same time, at the age of 20 months, the crosses exceeded the Kazakh white-headed girls in height at the withers by 2.5 cm (2.1%, $P < 0.05$), the height in the sacrum by 2.8 cm (2.2%, $P < 0.5$), the oblique length of the trunk is 5.6 cm (4.1%, $P < 0.05$), the girth of the chest behind the blades is 9.8 cm (5.4%, $P < 0.01$). Significantly greater was the advantage of Heifordian heifers.

In order to compare the interconnected measurements of individual body parts of young animals and to identify exteriors on this basis, body build indices were calculated. At the same time in newborn heifers significant intergroup differences are not established. At the same time, heifers of Kazakh white-headed breeds were inferior to Hereford and cross-country peers according to the size of indices of downfall, pereroslosti, massiveness and format of the task. A similar picture was observed at 6 and 12 months of age. Only at the age of 18 months were individual exteriors revealed (Table 3).

Table 3 – Body height indices of heifers in 18 months, %

Indexes	Group					
	I		II		III	
	$(\bar{X} \pm m_x)$	C_v	$(\bar{X} \pm m_x)$	C_v	$(\bar{X} \pm m_x)$	C_v
Long length	48,3 ± 0,43	2,78	49,0 ± 0,31	2,01	47,5 ± 0,45	3,02
Stretching	113,4 ± 0,38	1,05	112,3 ± 0,20	0,57	113,6 ± 0,35	0,97
Coxal-chest	102,0 ± 0,72	2,22	101,3 ± 0,84	2,63	102,0 ± 0,97	3,01
Thoracic	59,3 ± 0,72	3,83	63,8 ± 0,69	3,39	64,7 ± 0,53	2,58
Failures	127,5 ± 0,68	1,68	126,4 ± 0,80	2,00	130,0 ± 0,58	1,42
Overgrowth	104,0 ± 0,13	0,39	104,4 ± 0,18	0,53	104,2 ± 0,16	0,48
Bone mass	15,3 ± 0,14	2,90	15,4 ± 0,09	1,87	15,6 ± 0,07	1,51
Massiveness	144,7 ± 0,95	2,08	147,0 ± 0,91	2,04	147,8 ± 0,97	2,07
Broad chest	30,6 ± 0,54	5,62	32,5 ± 0,43	4,20	33,9 ± 0,45	4,21
Deep-wellness	51,7 ± 0,43	2,60	51,0 ± 0,31	1,95	52,5 ± 0,45	2,73
Whiplash	143,9 ± 2,39	5,25	152,5 ± 1,75	3,62	156,9 ± 1,39	2,80
Format set	104,5 ± 0,72	2,19	103,5 ± 0,57	1,75	103,5 ± 0,67	2,04
Width of the target	30,1 ± 0,44	4,61	32,1 ± 0,33	3,28	33,3 ± 0,28	2,64
Meatness	86,8 ± 0,64	2,33	89,6 ± 0,79	2,80	93,6 ± 0,50	1,69

Thus, Kazakh white-headed heifers were characterized by a smaller value of the chest index (by 4.5–5.4%), characterized by a lower value of massiveness indices (by 2.7–3.1%), the width of the task (by 2.0–3.2% %), meatiness (by 2.8–6.8%), broad-chestedness (by 1.9–3.3%), sewage (by 8.9–13%). For other indices, there were practically no differences between groups. In later periods, the same pattern was observed.

It should be noted that all the differences in body build indices were insignificant and in most cases statistically unreliable.

Conclusions. Thus, the analysis of the received materials testifies that young growth of all groups in the concrete conditions of the environment normally grew and developed. In this case, the youngest of all groups differed in proportional physique and fairly well-expressed meat forms. This was especially characteristic of bull-calves of Kazakh white-headed breed and hybrids.

Despite the observed fluctuations in the average daily weight gain due to the influence of paratypic factors on the young growth organism and the different rates of response of heifers of different genotypes to their changes, as well as the influence of the pubertal period and the peculiarities of puberty and the development of reproductive function, the young growth of all groups normally grew and developed.

In general, in heifers of different groups, the pattern of changes in body weight, growth rate, relative growth rate, and the coefficient of increase in body weight with age are unequal. At the same time, the crosses and Hereford heifers were the preferred ones for the complex of these indicators.

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ОСОБЕННОСТИ РОСТА, РАЗВИТИЯ ТЕЛОК МЯСНЫХ ПОРОД СКОТА РАЗНЫХ ГЕНОТИПОВ В УСЛОВИЯХ ТОО «АГРОФИРМА «DINARA-RANCH»

Аннотация. В статье приведены результаты влияния паратипических факторов на изменчивость живой массы телок у разных генотипов мясных пород крупного рогатого скота. Дана сравнительная оценка динамики живой массы и интенсивности роста и развития телок казахской белоголовой, герефордской пород и их помесей от рождения до 20-ти месячного возраста.

Ключевые слова: рост, развитие, порода, герефорд, казахская белоголовая, живая масса, телка, промер, индекс, прирост.

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ЖШС «АГРОФИРМА DINARA-RANCH» ЖАҒДАЙЫНДА ӘРТҮРЛІ ГЕНОТИПТІ ЕТТІ ІРІ ҚАРА МАЛ ТАНАЛАРЫНЫҢ ӨСУ, ДАМУ ЕРЕКШЕЛІКТЕРІ

Аннотация. Мақалада етті тұқымды ірі қара малдың әртүрлі генотипке жататын таналарының тірі салмағының өзгергіштігіне паратиптік факторлардың әсер етуі келтірілген. Қазақтың ақбас, герефорд тұқымдары және будандары таналарының туылғаннан 20 айлығына дейінгі тірі салмағы мен өсу, даму қарқындылығының динамикасына салыстырмалы баға берілген.

Түйін сөздер: өсу, даму, тұқым, герефорд, қазақтың ақ бас, тірісалмағы, тана, өлшем, индексі, өсім.