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BODY CONDITION SCORING OF YOUNG BEEF CATTLE OF DIFFERENT GENOTYPES AND ITS RELATION WITH LIVE WEIGHT AND PRODUCTIVITY

Abstract. For the profitable production of beef, it is not enough to have the animals differing in high productivity and quality forages in sufficient quantity. The main task at the production of beef is the correct organization of their rational use. In production groups, animals have different live weight, and norms of feeding of the beef cattle are calculated generally only taking into account their live weight. It is the wrong approach as animals in group can have identical live weight and have various need for energy depending on a body condition. In other words, norms of animals feeding have to be corrected not only depending on live weight, but also taking into account their body conditions. The regrouping of animals depending on body condition becomes necessary reception in technological process of beef production. It will allow to save expensive forages as in the structure of prime cost of beef the big share of expenses is the share of forages (about 60%). The aim of the researches – to define interrelation of live weight with body condition scoring of young stock, to reveal to what extent the live weight changes when the body condition is corrected by 1 point, and to adjust the feeding norms, depending on the animals body conditions. Researches were conducted on young animals of Hereford and Kazakh whiteheaded breeds. For carrying out researches, the method of the correlation, regression and statistical analysis were used. During the researches, it is defined that between the live weight and body condition scoring of animals, the high positive correlation is established (r = 0.74-0.76 for Hereford and r = 0.81-0.79 for the Kazakh white-headed breed). It has allowed to define regression coefficients between signs. It is established that an increase in body condition scoring on 1 point increases the live mass of young stock of Hereford breed on 26.1-26.7 kg, and in calves of the Kazakh whiteheaded breed – on 28.9-32.2 kg which made it possible to determine the necessary changes in the feeding level towards the increase for the young stock of the Hereford breed with 1 point in body condition scoring on 2.45 and 2.67; 2 points on 1.84 and 2.00; 3 points on 1.22-1.33; 4 points on 0.61-0.67 EFU, respectively, for heifer calves and bull-calves. For young stock of the Kazakh whiteheaded breed, these values were: 2.56 and 2.84; 1.92 and 2.13; 1.28 and 1.42; 0.64 and 0.71 EFU. Thus, researches show that observation of body condition of young stock, division of animals into groups with various body conditions and the organization of feeding, depending on body conditions, are necessary receptions for the achievement of economic efficiency at growing of young stock.

Keywords: young beef cattle; Hereford and Kazakh whiteheaded breeds; body condition score; live weight; feeding level.

Introduction. Without knowledge of the nature of development and growth of the body, it is impossible to consciously control the growth and development of animals and to make the most of their breeding.

The management of the herd is in charge of managing the growth and development of the organism. Management is the unifying factor in the organization of production, the correct and prompt solution of management issues on the farm ensures successful production and achievement of high economic indicators. In the past, the poor development of herd management became the main cause of the economic failures of many fattening farms. In Russia, GOST "Cattle for slaughter. Definition of body conditions" is used for determining the body conditions of livestock. They use it when animals are handed over to the meat-packing plant when it is already impossible to do something to improve the body condition of the cattle. Fatness must be determined directly during the fattening period, and on its basis, if necessary, take a quick decision to improve feeding.

In order to effectively manage the herd, it is necessary to have a reliable tool for assessing the body condition of beef cattle, which would allow to make rapid decisions on changes in the livestock feeding program [1, 2]. All rates of feeding young beef cattle are developed depending on the live weight and productivity. Such a tool can be a body condition scoring young beef cattle, which is closely related to live weight and productivity. We used a 5-point nutritional assessment system to assess the fatness of the young stock, although many researchers suggest using a 9-point system [3-6].

In our opinion, to evaluate the fatness of meat cows, a 9-point assessment system should be used, and a 5-point system is sufficient to assess the body condition of the young animals. To substantiate the approach to the solution of the problem, we determined the correlation coefficients between the body condition scoring of young animals, the live weight and the productivity of the young stock. Having discovered a high positive rectilinear connection between these signs, the coefficients of regression between the live weight, productivity and fatness of the young stock were determined.

Animals with unequal heredity and individual characteristics, strict selection by age, live weight and body conditions, respond differently to the conditions of feeding, maintenance and exploitation. This is due to the different genetic potential driven by the different heredity of the organism. Despite the careful selection of animals into groups by age, weight and fatness, each individual, due to unequal heredity and individual characteristics, will react differently to the conditions of feeding and maintenance. However much the breeders try to create the same conditions for all animals, they will differ in speed of growth among themselves. Our research, conducted earlier on meat cows, showed that the duration of pregnancy of the early ripening Angus breed was 272-273 days, while in the Limousine breed, as a longer growing, the period of intrauterine development was 278-280 days, and within the groups the difference in the birth dates of calves reached up to 29 days. This example shows that even during the intrauterine development period, animals differ in growth rate [2].

Young stock with low energy of growth, at the age of 15-20 months, lags 28-31% behind its peers in live weight. Such animals in the group usually have 4-8% of the number of all animals. Growing laggards in the growth of animals lead to a surplus of feed, a decrease in the intensity of growth of other animals, an increase in feed costs per unit of output and a rise in the cost of production and, as a consequence, a decrease in the economic efficiency of production. Animals lagging behind in growth should be discarded during cultivation, without waiting for the end of the fattening cycle.

Therefore, animals in the herd will grow with varying intensity and have different body conditions. The fatness of livestock is understood as the reserves of nutrients and energy reserves deferred in the body in the form of fat. It depends on many factors: on the feeding level of animals, on age, physiological condition, breed and other factors. Fatness has a great influence on the animal's live weight, the amount of pulp in the carcass of beef, the amount of internal fat and important body functions (reproductive abilities, organism resistance and others). Many researchers note that with an increase in the fatness of livestock, the mass of carcass meat, the yield of carcass, the mass and yield of internal fat, the slaughter weight and the slaughter yield are increased [2, 7, 8].

J. Whitey, In Stephens V., Weaver D. claim that the mass of cows, without the contents of the fore-stomachs, with 3 points of body condition scoring has a live weight of 382 kg. With an increase in fatness to 9 points, the live weight reaches 519 kg, that is, it increases by 1.36 times. This is due to the increase in fat and its relative percentage [12].

Many researchers argue that the live weight of animals largely depends on the state of fatness of livestock [9, 10, 12]. But, it should be noted that the live weight cannot be the only criterion for assessing the fatness of cattle and energy reserves in the animal's body, since the live weight itself depends on many

factors, e.g., on the fullness of the scar, the timing of the pregnancy of the cow. Animals with the same live weight can have different fatness, while animals with the same fatness can have completely different live weight [16].

In his studies, Parsons S.F. shows the dependence of the animal body condition on the thickness of subcutaneous fat [12].

The criterion for assigning an animal to one or another category of livestock fatness is the level of development of muscle tissue and the amount of deferred subcutaneous fat. Calves up to three months old have a small number of fat cells. With age, their number increases, and they form solid fat accumulations.

In the earliest stages, fat is the only part of the muscles and is not deposited as a separate tissue. Fatty tissue with age is deposited on the kidneys and in the omentum. Subsequently, lipid tissue begins to occupy a place among the muscle fibers. Depositing fat between the muscle fibers gives the meat a "marbling" degree. In early ripe specialized breeds of beef cattle, intermuscular fat is deposited more than in dairy or combined breeds of cattle.

The next stage, depending on the breed, is the accumulation of fat under the skin in a loose connective tissue. This gives the well-fed cattle a rounded shape. The deposition of subcutaneous fat in cattle when fattening begins with the back of the body - from the base of the tail, ischial tuberosity, knee folds, pelvis, waist, dewlap, etc. [16].

It is known that the number of muscle fibers is laid in the period of embryonic development, and in the postembryonic period of the animal, the increase in the musculature occurs only due to the enlargement of the muscle fibers. Their number after birth does not change, they become thicker and longer. In addition, it was found that the diameter of the muscle fibers depends on the state of fatness of cattle. A well-fed one-year-old calf can have the same thickness of muscle fibers with an old, depleted cow. If the conditions of feeding worsen, the diameter of the fibers decreases and in exhausted animals can be restored to normal size in a condition that the feeding is improved [20].

Since fat tissue plays a diverse role in the body of animals, the body condition of livestock is of great importance for maintaining health, reproductive functions and productivity. In the accumulation of fat in the body there is a well-known sequence of deposits on different anatomical parts. In young animals in the initial fattening period, fat tissue is deposited on the internal organs and between the muscle bundles, then accumulation takes place in the subcutaneous tissue, and at the end of the fattening period in young animals and in older animals, fat is deposited in muscle tissue.

With the deposition of fat in different anatomical areas, there is a certain proportionality. Accumulation of fat in one part is accompanied by an increase in fat in other places. Therefore, the determination of the sequence of adipose tissue deposition gives an idea only of the changes in the correlation of certain proportions.

Intermuscular fat is localized in loose connective tissue in the form of accumulations between individual muscles and group of muscles. Fatty tissue accumulates around large blood vessels and nerves, performing a protective function for them. Intramuscular fat is deposited in separate muscles between the fibers and enters the structure of the cells themselves. Intramuscular fat loosens the bunches of muscle tissue, and this fat determines the "marbleness" of the meat.

Subcutaneous adipose tissue is localized in large numbers around the tail head, on heads of femur, ischial tuberosity, waist, sides along the ribs, behind the shoulder blades, in the pelvic area, on the sternum. Sometimes the deposition of fat reaches a thickness of 4-6 cm or more. Between the time of deposition of lipid tissue and the development of the body, there is a direct link. Knowledge of such regularities made it possible to develop a system of body condition scoring of cattle. Fat deposition prevails in those areas where there is intensive growth in the period after birth [20].

Our research justifies the need to use correlation and regression coefficients between live weight, productivity and system of body condition scoring of young beef cattle to adjust the level of feeding in order to achieve the desired fatness and fodder saving.

The studies were commissioned by the Ministry of Agriculture of Russia at the expense of the federal budget in 2016 as part of the research work of the FSBEI HE "Samara State Agricultural Academy" on the theme "Development of the practice guide on the body condition scoring of beef cattle and its application in herd management".

The aim of this work is to determine the relationship between the body condition scoring of young beef cattle with live weight and the regression coefficient, followed by the use of regression coefficients to calculate changes in the feeding program of young animals.

Scientific novelty. In the course of the studies, the relationship between the body condition scoring and the live weight of young stock of different breeds was revealed for the first time, which allowed to determine the regression coefficients and to calculate the changes in the feeding level of the young animals to achieve the desired live weight and fatness at growing process.

Materials and methods. The material for the study was the young stock at the age of 7 months. The studies were carried out during the annual complex assessment of beef cattle (bonitation) in 2016 in "K.Kh. Polyanskoye" OOO of the Samara region. The object of the study was the relationship between the body condition scores, the live weight and the productivity of young beef cattle [26].

To substantiate the use of the body condition scoring for herd management, the relationship (correlation coefficient and regression coefficient) between the live weight, the average daily gain, and the fatness of the young stock were determined. The correlation coefficient was calculated as a phenotypic correlation for a large sample. The regression coefficient was determined as the product of the correlation coefficient by the quotient of dividing the standard deviation of one characteristic by the standard deviation of another characteristic. For the experiment, four groups of animals were formed from 66 heifer calves and 44 bull-calves of the Hereford breed, 32 heifer calves and 50 bull-calves of Kazakh whiteheaded breed. The fatness of livestock was determined by visual inspection of animals and by palpation, according to the 5-point scale for body condition scoring of young beef cattle.

Biometric data processing is carried out according to the generally accepted methodology [27].

The results of the research and their discussion. During the experiments, correlation and regression coefficients were determined between the live weight of young animals, the average daily gain and body condition of young animals estimated in points. For the determination of the regression coefficient, the correlation coefficient was used, the correlation determinations were the variability of each trait under study.

The live weight, the body condition scoring, the productivity of the young stock and their variability were determined with regard to the sex of the animals.

According to the live weight, the bulls of the Kazakh whiteheaded breed leave behind their Hereford herdmates on 16.7 kg, (7.96%) and heifer calves - on 9.8 kg (4.85%). The greatest variability of live weight was observed in the group of bulls of Hereford breed - 12.0%, in bulls of Kazakh whiteheaded breed - 11.8% (table 1).

Table 1 – Variability of live weight and body condition scoring of young animals

Indicator	Breed			
	Hereford		Kazakh whiteheaded	
	bulls	heifer calves	bulls	heifer calves
Live weight (M), kg	210.0	202.0	226.7	211.8
root-mean-square deviation (σ), kg	25.2	20.2	27.1	22.8
Coefficient of variability (C_v), %	12.0	10.0	11.8	10.8
Error of arithmetical mean, kg	4.40	3.40	4.90	4.90
Body condition scoring	4.5	4.2	4.5	4.1
root-mean-square deviation (σ), point	0.51	0.30	0.50	0.44
Coefficient of variability (C_v), %	11.6	9.8	11.6	10.7
Error of arithmetical mean, point	0.11	0.09	0.10	0.14

Among the heifers of the Kazakh whiteheaded breed, the coefficient of variability was greater. This indicates that the Kazakh whiteheaded breed is less consolidated by the traits under study.

The bulls were the most well-fed, they had the same body condition scoring in both breeds – 4.5 points, with the same coefficient of variability, while the fatness of the heifers was slightly lower,

4.2 and 4.1 points, respectively. Variability in the group of Kazakh whiteheaded breed was higher than that of Hereford breed by 1.1%.

A study of the coefficient of correlation and regression between body condition and live weight of young animals showed a high degree of rectilinear interdependence of symptoms (table 2).

Table 2 – Coefficients of correlation and regression between body condition and live weight of young animals

Indicator	Breed			
	Hereford		Kazakh whiteheaded	
	bulls	heifer calves	bulls	heifer calves
Correlation coefficient (r)	0.74	0.76	0.81	0.79
Regression coefficient (R)	26.7	26.1	32.2	28.9
Accuracy of the correlation coefficient (td)	0.999	0.999	0.999	0.999
Accuracy of the regression coefficient (td)	0.999	0.999	0.999	0.999

In all cases, the correlation coefficient was high, positive and rectilinear, within the limits of 0.74 to 0.81. This is the reason to use it when determining the regression coefficient. It is established that when the fatness of animals changes by one point their live weight changes by 26.1-32.2 kg.

Knowing how much energy feed units are required per kilogram of growth of live weight, it is possible to calculate and make adjustments to the feeding program of young animals taking into account their fatness.

Coefficients of correlation and regression had a high degree ($P>0.999$) of certainty. In the course of the studies, the level of the young stock productivity and the coefficient of correlation and regression between the average daily gain and body condition of cattle were also determined.

Analysis of the performance of young animals (table 3) indicates that they were not high enough in both groups. This can be explained by the fact that the young animals were grown in summer without feeding with concentrated fodder. The bulls of the Kazakh whiteheaded breed differed by the highest productivity among young animals - 858.5 g, which is 7.7 g more than in bulls of Hereford breed with an unreliable difference in the indexes taken into account ($P<0.95$).

Table 3 – Average daily gain and its variability

Indicator	Breed			
	Hereford		Kazakh whiteheaded	
	bulls	heifer calves	bulls	heifer calves
Average daily gain, g	850.8	791.8	858.5	767.7
Root-mean-square deviation (σ), g	112.3	83.9	117.6	96.7
Coefficient of variability (C_v), %	13.2	10.6	13.7	12.6
Error of arithmetical mean, g	17.7	16.1	17.1	20.0

Among the heifer calves, the productivity was higher for the representatives of Hereford breed - 791.8 g, which is more than for their herdmates of the Kazakh whiteheaded breed by 24.1 (3.14%). According to the magnitude of the sign, the root-mean-square deviations of the indicator in the groups are also different.

The coefficient of variability was in the range from 10.6 to 13.7%, with slight oscillations taking into account breed and sex of animals.

The coefficient of correlation and regression between the average daily gain and fatness of the young, determined by a 5-point scale is presented in table 4.

The coefficient of correlation between the productivity of young animals and the body condition scoring was high in all groups, positive in a straightforward manner. It is important to note that among the Hereford young animals, both in heifers and bulls, the correlation coefficient was 0.86. The same correlation coefficient (0.78) was also established in young animals of the Kazakh whiteheaded breed.

The regression coefficient made it possible to reveal that a change in the body condition of young animals by 1 point leads to a change in the live weight of the bull- calves by 136.8 and 148.4 g per day.

Table 4 – Coefficients of correlation and regression between average daily gain and body condition scoring of young animals

Indicator	Breed			
	Hereford		Kazakh whiteheaded	
	bulls	heifer calves	bulls	heifer calves
Correlation coefficient (r)	0.86	0.86	0.78	0.78
Regression coefficient (R)	148.4	100.4	136.8	109.1
Accuracy of the correlation coefficient (td)	0.999	0.999	0.999	0.999
Accuracy of the regression coefficient (td)	0.999	0.999	0.999	0.999

As for the heifers, a change in the fatness of livestock by 1 point leads to a change in the live weight by 100.4 and 109.1 g per day (P>0.999).

Knowing how many kilograms you need to change the live weight to achieve the required fatness, you can determine how much you need to change the feeding level of animals (table 5).

Table 5 – Change in the level (norms) of feeding young animals with live weight of 200 kg, EFU

Body condition scoring, point	Desired body condition scoring, point	Breed			
		Hereford		Kazakh whiteheaded	
		bulls	heifer calves	bulls	heifer calves
1	5	norm+2.67	norm +2.45	norm +2.84	norm +2.56
2	5	norm +2.00	norm +1.84	norm +2.13	norm +1.92
3	5	norm +1.33	norm +1.22	norm +1.42	norm +1.28
4	5	norm +0.67	norm +0.61	norm +0.71	norm +0.64
5	5	norm (5.0)	norm (4.7)	norm (5.0)	norm (4.7)

For example, to achieve the desired 5 points, for bulls of Hereford breed, having a body condition of 3 points, it is necessary to increase the feeding level by 1.33 energy feed units, and for heifer calves – by 1.22 EFU.

Conclusion. Thus, there is a high, rectilinear positive relationship between the live weight of the young stock, the average daily gain, and the body condition scoring. The established coefficients of regression make it possible to determine the change in the live weight of young animals when the body condition is changed by 1 point. This is the basis for making adjustments in the feeding program for young animals, which will ensure the desired fatness by the end of fattening and the high economic effect of growing young stock.

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ӘРТҮРЛІ ГЕНОТИПТІ ЕТТІ ІРІ ҚАРА ЖАС МАЛДАРЫНЫҢ ҚОҢДЫЛЫҒЫН БАЛЛМЕН БАҒАЛАУ ЖӘНЕ ОНЫҢ ТІРІЛЕЙ САЛМАҒЫ ЖӘНЕ ӨНІМДІЛІГІМЕН ӨЗАРА БАЙЛАНЫСТЫҒЫ

Аннотация. Сиыр етін рентабельді өндіру үшін жоғары өнімділігімен ерекшеленетін малдардың, жоғары сапалы азықтардың көп мөлшерде болуы жеткілікті емес. Сиыр етін өндірудегі басты міндет – оларды ұтымды пайдалануды дұрыс ұйымдастыру болып табылады. Шаруашылық топтағы малдардың тірілей салмағы әр қилы болып келеді, ал етті ірі қара малдардың азықтандыру нормасы есептелінген, бірақ та, негізінен олардың тірілей салмағын есепке ала отырып жасалған. Бұл дұрыс емес, өйткені топтағы малдардың тірілей салмақтары бірыңғай болып, қоңдылық күйіне байланысты энергияға деген мұқтаждығы әр түрлі болады. Басқаша айтқанда, малдарды азықтандыру нормасы тірілей салмағына байланысты ғана емес, сонымен бірге малдардың қоңдылық күйіне қарай нақтылануы тиіс. Қоңдылығына байланысты малдарды қайтадан топтастыру сиыр етін өндірудің технологиялық үрдісінде негізгі тәсіл болып саналады. Бұл қымбат азықтандыруды үнемдеуге мүмкіндік береді, өйткені сиыр етінің өзіндік құны құрлымында шығындардың үлкен үлесі (60%) азыққа тиесілі. Зерттеу мақсаты – жас малдардың қоңдылығын баллмен бағалағанда олардың тірілей салмақпен өзара байланыстылығын анықтау, қоңдылығы бір баллға өзгергенде тірілей салмағы

қаншалықты ауытқитынын айқындау және малдардың қоңдылық күйіне байланысты азықтандыру нормасын нақтылау. Зерттеулер герефорд және қазақтың ақ бас тұқымдарының жас малдарына жүргізілді. Зерттеу жүргізу үшін коррелияциялық, регрессиялық және статистикалық талдау әдістері қолданылды. Зерттеу жүргізу барысында малдардың тірілей салмағы мен қоңдылығын баллдық бағалау арасында жоғарғы оң байланыс байқалды (герефорд үшін r= 0,74-0,76 және қазақтың ақ бас тұқымы үшін r=0,81-0,79). Бұл белгілер арасындағы регрессия коэффициентін анықтауға септігін тигізді. Зерттеу кезінде анықталғаны, малдың қоңдылығын 1 балға арттыру герефорд тұқымының жас малының тірілей салмағын 26,1-26,7кг өсіреді, ал қазақтың ақ бас тұқымдарының бұзауларында бұл көрсеткіш 28,9-32,2кг, яғни азықтандыру деңгейіне қажетті өзгертулер енгізуге мүмкіндік берді, қоңдылығы 1 балл герефорд тұқымының жас малдары үшін 2,45-2,57; ал 2 балға 1,84-2,00; 3 балға 1,22-1,33; 4 балға 0,61-0,67, тиісінше таналар мен бұқашықтарға да энергетикалық азық өлшемін арттыруға ықпалын тигізді. Қазақтың ақ бас тұқымының жас малдары үшін бұл көрсеткіштер 2,56 және 2,84; 1,92 және 2,13; 1,28 және 1,42; 0,64 және 0,71 энергетикалық азық өлшемін құрады. Сол себептен жас малдардың қоңдылығын қадағалау, қоңдылық күйіне байланысты азықтандыруды дұрыс ұйымдастыру және әр түрлі қоңдылық күйдегі малдарды топқа бөлу, жас малдарды өсіруде экономикалық тиімділікке жетудің маңызды жолдары болып табылады.

Түйін сөздер: етті ірі қара жас малы, герефорд және қазақтың ақ бас тұқымдары, қоңдылығын баллмен бағалау, тірілей салмағы, азықтандыру деңгейі.

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БАЛЛЬНАЯ ОЦЕНКА УПИТАННОСТИ МОЛОДНЯКА МЯСНОГО СКОТА РАЗНЫХ ГЕНОТИПОВ И ЕЕ ВЗАИМОСВЯЗЬ С ЖИВОЙ МАССОЙ И ПРОДУКТИВНОСТЬЮ

Аннотация. Для рентабельного производства говядины недостаточно иметь животных, отличающихся высокой продуктивностью, и корма высокого качества в достаточном количестве. Главной задачей при производстве мяса является правильная организация их рационального использования. В производственных группах животные обладают разной живой массой, а нормы кормления мясного скота рассчитаны, в основном, только с учётом их живой массы. Это неправильный подход, так как в группе животные могут иметь одинаковую живую массу и иметь различную потребность в энергии в зависимости от состояния упитанности. Другими словами, нормы кормления животных должны корректироваться не только в зависимости от живой массы, но и с учётом состояния упитанности животных. Перегруппировка животных в зависимости от упитанности становится необходимым приёмом в технологическом процессе производства говядины. Это позволит сэкономить дорогостоящие корма, так как в структуре себестоимости говядины большая доля затрат приходится на корма (около 60%). Цель исследований – определить взаимосвязь живой массы с балльной оценкой упитанности молодняка, выявить насколько изменяется живая масса при изменении упитанности на 1 балл, и скорректировать нормы кормления в зависимости от состояния упитанности животных. Исследования проводили на молодняке герефордской и казахской белоголовой породы. Для проведения исследований использовался метод корреляционного, регрессионного и статистического анализа. В ходе исследований определено, что между живой массой и балльной оценкой упитанности животных установлена высокая положительная связь (r = 0,74-0,76 для герефордской и r = 0,81-0,79 для казахской белоголовой породы). Это позволило определить коэффициенты регрессии между признаками. Установлено, что повышение упитанности на 1 балл увеличивает живую массу молодняка герефордской породы на 26,1-26,7 кг, а у телят казахской белоголовой породы на 28,9-32,2 кг, что дало возможность определить необходимые изменения уровня кормления в сторону увеличения для молодняка герефордской породы с упитанностью 1 балл на 2,45 и 2,67; 2 балла на 1,84 и 2,00; 3 балла на 1,22 и – 1,33; 4 балла на 0,61 – 0,67 ЭКЕ соответственно тёлкам и бычкам. Для молодняка казахской белоголовой породы эти значения составили: 2,56 и 2,84;

1,92 и 2,13; 1,28 и 1,42; 0,64 и 0,71 ЭКЕ. Таким образом, исследования показывают, что наблюдение за состоянием упитанности молодняка, разделение животных на группы с различным состоянием упитанности и организация кормления, в зависимости от состояния упитанности, являются необходимыми приёмами для достижения экономической эффективности при выращивании молодняка.

Ключевые слова: молодняк мясного скота; герефордская и казахская белоголовая породы; балльная оценка упитанности; живая масса; уровень кормления.

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