European Journal of Interdisciplinary Research and Development
Volume- 46 December- 2025
Website: www.ejird.journalspark.org ISSN (E): 2720-5746

GROWTH AND DEVELOPMENT OF LIMOUSIN BULL CALVES IN THE CONDITIONS OF KARAKALPAKSTAN

Kozhambergenova K. K.
1st Year Doctoral Student
Termez State University of Engineering and Agrotechnologies
e-mail: kumisaykojambergenova95@gmail.com

Dosmukhamedova M.
Scientific Supervisor, Doctor of Agricultural Sciences, Professor
Tashkent State Agrarian University

Abstract
This study presents indicators of growth and development of Limousin bull calves in the conditions of Karakalpakstan. It highlights the differences in live weight, absolute growth, and daily growth under various technological conditions in relation to their age dynamics. Conclusions are drawn based on these findings.

Keywords: Limousin breed, bull calves, growth and development, live weight, absolute growth, differentiation, conclusions.

Introduction

The concept of animal growth and development encompasses a complex series of biochemical, morphological, and physiological changes that occur throughout an organism's life. Individual development of animals, known as ontogenesis, begins with the formation of a zygote and ends with the death of the organism. It consists of qualitatively distinct states or life phases of the organism. Generally, an animal's hereditary characteristics and genotype determine its developmental potential within these phases, primarily in accordance with its inherited reactions to environmental factors, intercellular and intertissue interactions, as well as neurohumoral control systems [1.81-85. p.].

Individual development of animals, known as ontogenesis, refers to the growth of cells, tissues, organs, and the organism as a whole, which is understood as quantitative change. Along with animal growth, the process of development also occurs, which is considered differentiation (qualitative change), and is realized as a result of the interdependence of these processes.

The sequential alternation of stages, periods, and phases of animal development requires appropriate living conditions, including feeding, housing, and utilization. In the ontogenesis of mammals, two periods are distinguished: embryonic or intrauterine (with sub-periods - embryonic, pre-fetal, and fetal) and postembryonic or postuterine (with sub-periods - newborn, lactation, puberty, maturity or the course of functional activity, and old age).

[2. 144-146.p.] According to the information provided, as a result of human influence on this growth and development process, rapidly growing and adaptable animal breeds have been created in the phylogeny of various types of farm animals. Beef cattle are characterized by

intensive growth and development, which is manifested, in particular, in the ratio of muscle and fat tissues in their body at the same stages of ontogenesis compared to late-maturing animals.
The most important factors influencing the growth and development of animals are primarily breed, individual hereditary characteristics, nutrition, and housing conditions. The study of animal growth and development serves as the theoretical foundation for implementing advanced livestock farming technologies, as the production of specific products depends on certain phases of an animal's life, and growth phenomena provide quantitative expression of productivity traits [3. https://www.cnshb.ru/AKDiL/0024/base/RR/002].
Animal growth is determined through regular weighing, with absolute growth indicators accounting for average daily and monthly growth over specific time periods. [4. https://cyberleninka.ru/article/n/eksteriernye-osobennosti]. Relative growth is calculated as the growth rate, expressed as a percentage of the mass increase over a specific period relative to half the sum of the initial and final masses. To assess animal development, indicators such as the proportions between body parts, data on tooth replacement, onset of sexual maturity, as well as certain internal indicators (protein ratios in blood serum, activity of specific endocrine glands, etc.) are used.

Research objective:
To determine the growth and development of Limousin bulls under various technological conditions in the Republic of Karakalpakstan.

Research Methodology
The live weight of the bull calves at birth and at 3, 6, 9, 12, and 18 months of age was determined by weighing each on a separate electronic scale before morning feeding.
Absolute growth was determined by the following formula:

$$A = \frac{(W0 - W1)}{t}$$

Where: A - Absolute growth; kg
W_0- Initial live weight; kg
W_1- Final live weight; kg,
t-Time, days
The obtained data were biometrically processed using the Microsoft Excel 2010 computer program, based on the textbook by A.M. Yakovenko, T.I. Antonenko, M.I. Selionova (2013)

Research results
In our research work, aimed at determining the growth and development indicators of cattle belonging to the Limousin breed kept under various technological methods, experiments were carried out on the cattle farm of the "Shuhrat Babajanov" farm in the Beruniy district under pasture, semi-pasture, and tied conditions. The results of the experiment are summarized in Table 1 below.

Table 1 Live weight indicators of bull calves by age, kg

Growth period, months	Groups, (n=10)					
	I		II		III	
	Technology					
	Pasture conditions		Semi-pasture conditions		Tied conditions	
	±S	Cv, %	±S	Cv, %	±S	Cv, %
At birth	29.7±0.42	4.50	29.3±0.47	5.10	29.9±0.43	4.58
3	127.1±1.27	3.16	128.1±1.93	4.78	129.6±2.04	4.98
8	224.8±3.35	4.71	229.2±2.81	3.88	233.9±3.64	4.92
12	327.5±4.45	4.29	343.2±2.94*	2.71	347.1±2.81**	2.56
16	503.3±2.18	1.37	519.3±3.44**	2.10	534.1±3.18***	1.88

Note: *P<0.05, **P<0.01, ***P<0.001

Analysis of the data summarized in Table 1 shows that while there was no significant difference (±0.6 kg) in all storage technologies during the newborn period, differences in age dynamics were observed. In pasture conditions, the weight at 3 months was 127.1±1.27 kg, while in semi-pasture conditions, this indicator was 128.1±1.93 kg, and in tethered storage technology, it was 129.6±2.04 kg. It can be noted that the tethered storage technology showed a slight advantage (1.7-2.7 kg), and this trend continued in subsequent age dynamics. By 8 months of age, these indicators in pasture conditions were 224.8±3.35 kg, in semi-pasture conditions 229.2±2.81 kg, and in tethered storage technology 233.9±3.64 kg. By the 12th month, the differences became more pronounced. Compared to pasture conditions (327.5±4.45 kg), semi-pasture technology showed an advantage of 12.7 kg (343.2±2.94 kg, P<0.05), and tethered storage technology showed an advantage of 19.6 kg (347.1±2.81 kg, P<0.001).

At 16 months of age, which is the slaughter period for meat, these indicators, depending on the aforementioned storage technologies, showed that semi-pasture technology (519.3±3.44 kg) exceeded pasture conditions (503.3±2.18 kg) by 16.0 kg (P<0.05), while tethered storage technology (534.1±3.1 kg) exceeded it by 30.8 kg (P<0.001).

If we take the average indicator of all storage technologies, then the differences between storage technologies are shown in the figure below.

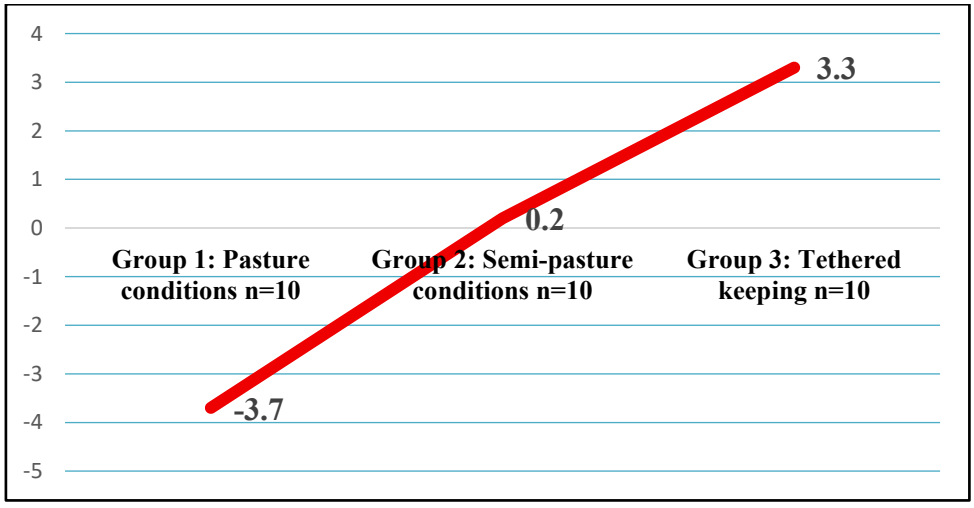

Figure 1. Percentage difference from the average indicator of bull calves kept under different technological conditions,%

Live weight indicators determine the absolute growth rates of animals over a specified period. The results of the absolute growth indicators obtained from our experimental work are presented in Table 2 below.

As shown in Table 2, it has been demonstrated that the absolute growth indicators varied across different growth stages, and it can be observed that the growth rate increased during the period when young bull calves transitioned to independent feeding.

Table 2Absolute growth indicators of bull calves according to age dynamics, kg

Growth period, months	Groups, (n=10)		
	I	II	III
0-3	97.4±1.33	98.8±1.66	99.7±1.87
3-8	97.7±3.91	101.1±3.99	104.3±4.25
0-8	195.1±3.22	199.9±2.82	204.0±3.58
8-12	102.7±5.68	114.0±4.52	113.2±3.47
0-12	297.8±4.57	313.9±3.07*	317.2±2.72**
12-16	175.8±5.14	176.1±4.92	187.0±4.23
0-16	473.6±2.35	490.0±3.72**	504.2±3.30**

Note: *P<0.01, **P<0.001

Table 2 data shows the intensity of absolute growth indicators of live weight over a certain period. According to the experimental results, from birth to 3 months of age, the live weight of bull calves increased by 97.4±1.33 kg in pasture conditions, 98.8±1.66 kg in semi-pasture conditions, and 99.7±1.87 kg in tethered keeping technology. Compared to pasture conditions, bull calves kept in semi-pasture conditions gained 1.4 kg more, while those in tethered conditions gained 2.3 kg more. This trend continued in subsequent ages. From birth to 16 months of age, the live weights were 473.6±2.35 kg in pasture conditions, 490.0±3.72 kg in semi-pasture conditions, and 504.2±3.30 kg in tethered keeping conditions. Compared to pasture conditions, bull calves kept in semi-pasture conditions showed an advantage of 16.4 kg, while those in tethered conditions had an advantage of 26.6 kg (P<0.001) in age dynamics.

Conclusion

From birth to 3 months of age, the growth and development of Limousin breed bull calves did not differ significantly under different technological conditions. However, from 12 months to 16 months of age, intensive growth was observed.

References

1. Tatarkina N. I., Svyazhenina M. A., Ponomareva. Ye. A. Application of Exterior Evaluation in Selection. Agrarian Bulletin of the Urals Vol. 23, No. 10. 2023. 81-85 p. DOI: 10.32417/1997-4868-2023-23-10-81-90.

Kosilov, V.I., Zhaimysheva, S.S., Sivoilezova, N.A. FGBOUVO Orenburg State Agrarian University. Exterior features of Simmental bulls and their crossbreeds with Limousin cattle of different generations. J. Animal Science. 2021. 144-146 p.

3.https://www.cnshb.ru/AKDiL/0024/base/RR/002334.shtm

4.https://cyberleninka.ru/article/n/eksteriernye-osobennosti-bychkov-simmentalskoy-porody-i-eyo-pomesey-s-limuzinami-raznyh-pokoleniy