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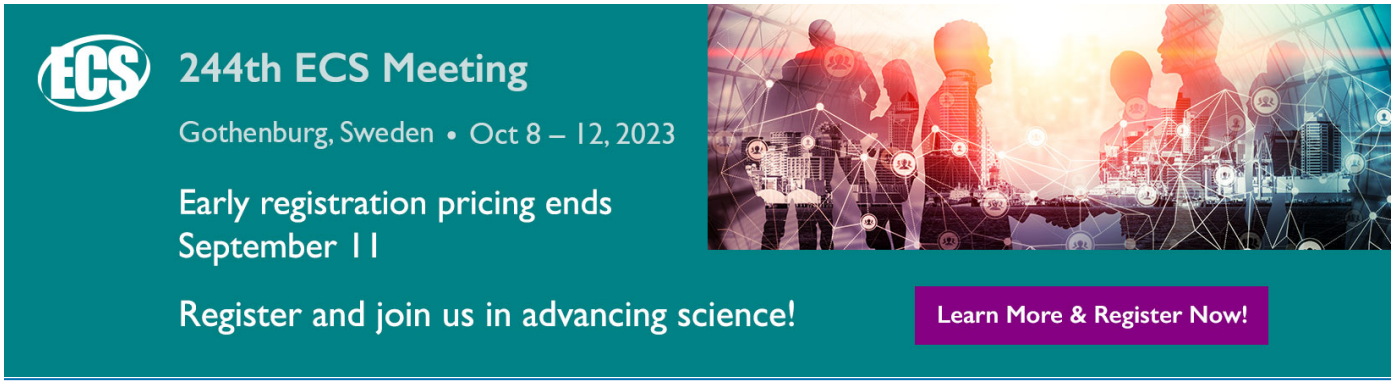

Growth and development of bulls of the red steppe breed in lightweight buildings

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Abstract. The article examines the effectiveness of growing and fattening young cattle in the conditions of the hot climate of Uzbekistan in light-weight premises, in individual cages and in houses for individual maintenance after birth up to three months of age, and then in open areas with shady canopies, by the "cold" method, up to 18 months of age. Growing young animals using this technology has shown its advantage over the traditional method, with group keeping indoors. The organization of such a method of rearing young cattle at all stages of production ultimately ensured an increase in the efficiency of animal husbandry. The data obtained indicate that a more active increase in the productivity of livestock and the biological potential with the corresponding data are obtained in the conditions of rearing calves in a mixed method. It is indicated that in cattle breeding, the use of this method of growing allows farms to increase beef production and improve their quality, maximize the preservation of newborn calves and reduce the incidence of animals by increasing their natural resistance.

1. Introduction

In the system of measures to increase beef production, an important place is occupied by dairy and dairy-beef cattle breeding, since beef cattle breeding as an independent specialized industry in the Republic of Uzbekistan has not yet received proper development. Increasing the meat potential of dairy cattle is of paramount importance in solving the meat problem at the present stage. Despite the fact that the proportion of livestock of the highest fatness has increased by more than 90%, nevertheless, the terms of growing and fattening it are more than 24 months, which leads to high feed costs and does not allow obtaining high-quality beef with an optimal ratio of protein to fat.

At present, the growing and fattening of young cattle in the republic is gradually being transferred to small rental farm and cluster forms of management. [12]

In this regard, it is necessary to develop a new technology for intensive rearing and fattening of young cattle for small farms, taking into account the characteristics of a particular zone, in particular, the Central Asian region, characterized by extreme natural and climatic features. The rearing technology should be such that the animals' potential abilities to achieve the maximum live weight in a relatively short period of time would be most fully, with the least labor and cost, manifested.

It is known that small farms should be built from cheap building materials, since it is expensive premises that increase the cost of production. In this regard, finding ways to build cheap lightweight

premises for growing and fattening young cattle is one of the main tasks facing scientists and practitioners.

The development of animal husbandry in a hot climate introduces significant changes not only in the system of feeding and selection of cattle, but also in its maintenance.

In order to optimize fattening and reduce the cost of its cost, in recent years the country has become widespread keeping livestock in lightweight premises, on open and semi-open mechanized sites. These sites are simple in design, do not require large investments, labor-intensive processes do not require complex mechanization with the help of mass-produced equipment, and this increases labor productivity. The low cost of construction, the low cost of maintaining livestock, the low cost of repairing equipment and cleaning manure make keeping beef bulls on feedlots even more economically profitable and promising for tenants and farmers compared to closed-type complexes.

Lightweight housing and individual calf huts are a highly efficient solution for rearing healthy replacement calves. The method of "cold rearing" of calves is based on the transfer of young cattle in houses for individual maintenance from birth to three months of age. It is known that the calf easily adapts to the temperature regime in which it is placed from the third day of life, therefore, light-weight buildings and houses are used all year round. To create comfortable conditions in the houses, a pillow of straw with a thickness of about 12-18 cm is poured. At the same time, such keeping of calves must necessarily be accompanied by the correct feeding technology (modern milk feeding scheme, sufficient water, as well as accustoming to roughage for the full development of the digestive organs). [3, 4, 5, 6]

With intensive rearing of young animals for meat, only one full-fledged feeding is still not enough. For animals, good conditions of care and maintenance should be observed, which also determine the development and growth of animals. According to literature sources, with an unsatisfactory microclimate, the productivity of animals drops by 20-30% [7, 8, 9, 10].

Observations carried out by scientists of the Uzbek Research Institute of Animal Husbandry and Poultry for 20-25 years have proved that in the specific climatic and economic conditions of Uzbekistan, the system of keeping cattle in light-weight premises is the most effective.

It is known that cattle, due to their biological characteristics, are more susceptible to heat stress than to cold stress, and technology elements are built on this physiological mechanism, providing for the so-called "cold" method of rearing young animals.

Keeping methods that are as close as possible to natural conditions contribute to the active physiological self-regulation of the body, increase resistance and a variety of diseases, improve metabolic processes and, thereby, more fully manifest the potential productivity of animals. We took this principle as a basis when developing technologies for keeping young cattle for small farms. At the same time, the task is to determine the influence of the scientific method of keeping the meat productivity of animals. In this regard, the search and implementation in agricultural enterprises of resource-saving methods of keeping young cattle, aimed at increasing growth, development, immunobiological characteristics of the body, meat productivity, is of great scientific and practical importance.

The study of this issue is currently acquiring special scientific and practical interest and is relevant.

2. Materials and methods

The methodological basis for conducting research, as given in the works and positions of scientists in the field of beef cattle breeding, served. In the studies, analytical, clinical, calculation and statistical research methods generally accepted in zootechnics were used.

To conduct the experiment, according to the principle of analogues, 3 groups of bulls of the red-steppe breed, 15 heads each, were formed according to the following scheme (table 1).

Table 1 . Scheme of experience.

Group	Technology option		
	From birth to 2 months	From 2 to 12 months	From 12 to 18 months

Control	Closed premises, group keeping without leash	On sites with a shady canopy, group content without a leash	Fattening indoors, on a leash
I - th experienced	In individual houses	On sites with a shady canopy, group content without a leash	Fattening on sites with a shady canopy, on a leash
II - th experienced	In buildings of lightweight construction in individual cages	In buildings of lightweight construction with group maintenance with walking	Fattening on sites with a shady canopy, on a leash

The change in live weight was taken into account by monthly weighing in the morning before feeding. Absolute, relative and average daily live weight gain was calculated according to generally accepted methods. The linear growth of the animals was studied by taking the main measurements of the body (height at the withers and rump, width and girth of the chest, oblique length of the body, girth of the chest and semi-girth of the rear). Based on these measurements, physique indices were calculated.

3. Results and discussion

In our experience, animals of the control group from 12 to 18 months were in enclosed spaces on a leash. Technological processes are mechanized: feed preparation for feeding is carried out in a special workshop, feed is distributed using a KTU-10 mobile feeder, watering from individual automatic drinking bowls, manure removal is carried out using a TSN-160 scraper conveyor twice a day.

Animals of I and II experimental groups are fattened on a site with a shady canopy on a leash, feeding and watering was the same as in the control group, manure cleaning was carried out with a bulldozer.

An analysis of the current state of beef production in the republic shows that the largest amount of it is obtained from bulls of dairy and combined breeds using different growing and fattening technologies.

Therefore, the issue of providing domestic consumers with meat and beef in order to increase the food security of the republic, in a strategically important food product, will have to be addressed through the use of different technological solutions in dairy and combined herds of productivity.

The dynamics of the weight growth of the experimental bulls with different methods of keeping and individual age periods are provided in table 2.

Table 2. Changes in weight growth of experimental animals (kg).

Age, months	Group		
	Control	I experienced	II experienced
When setting 15 days	36.0±0.82	35.7±0.88	38.0±0.84
3	83.0±0.88	87.6 ± 1.04	90.2 ± 1.02
6	140.0±1.60	147.0 ± 1.72	149.0 ± 1.38
9	204.0±1.36	215.6 ± 1.44	217.6 ± 1.68
12	270.0±2.82	285.0 ± 2.64	290.0±2.90
fifteen	341.0±2.25	365.0±2.58	370.2 ± 2.96
eighteen	424.1 ± 2.18	454.2 ± 2.44	459.6 ± 3.10

Table 2 shows that as a result of growing bulls of the experimental groups by the "cold" method, it significantly influenced weight growth. At the age of 18 months, they exceeded their peers in the control group by 35.5 and 31 kg, or 7.73% and 6.63%, respectively.

Processing of the obtained material showed that the difference between the control II-experimental and the control I-experimental at 18 months of age was statistically significant ($P > 0.999$).

A more visual representation of the intensity of growth of bulls is given by the average daily gains in live weight, which are shown in table 3.

Table 3. Average daily gains in live weight of experimental bulls.

Experience period, days	Group		
	Control	I-experienced	II-experimental
15 - 90	626.0 ± 9.20	692.0 ± 10.24	696.0 ± 8.86
90 - 180	633.0 ± 8.46	666.0 ± 9.26	653.3 ± 9.44
180 - 270	711.0 ± 7.72	762.2 ± 8.18	762.2 ± 8.76
270 - 360	733.0 ± 9.36	771.1 ± 10.24	804.4 ± 11.20
360 - 450	788.8 ± 10.12	888.8 ± 11.08	891.1 ± 10.86
450 - 540	923.3 ± 8.16	991.1 ± 7.72	993.3 ± 8.28
15 - 540	739.2 ± 4.38	797.1 ± 5.12	803.0±5.68

The highest average daily gains for the entire period of the experiment were obtained in bulls of the 1st and 2nd experimental groups, which were kept in light-weight buildings and in open areas with a shady canopy and in individual houses (797.1 and 803.0 grams). They outperformed their control peers by 57.9 and 63.8 grams, or 7.27% and 7.95%, (P > 0.0.999), respectively.

For a more visual representation of the growth of bulls, we studied the absolute and relative growth rates (table 4).

Table 4. Absolute and relative growth rates of bulls.

Experience period, days	control		I-experienced		II-experimental	
	Absolute-naya , kg	Refer-body, %	Absolute-naya , kg	Refer-body,%	Absolute-naya, kg	Refer-body,%
15 - 90	47.0	78.99	51.9	84.18	52.2	81.43
90 - 180	57.0	51.12	59.4	51.00	58.8	49.16
180 - 270	64.0	37.20	68.6	37.83	68.6	37.48
270 - 360	66.0	27.84	69.4	27.72	72.4	28.52
360 - 450	71.0	23.24	80.0	24.61	80.2	24.29
450 - 540	83.1	21.72	89.2	21.77	89.4	21.54
15 - 540	388.1	168.70	418.5	170.85	421.6	169.45

Analyzing the growth energy of experimental bull-calves, it can be stated that the highest growth energy was characteristic of them in the first three months of growing, then it gradually decreased, this, apparently, is due to species characteristics. In the context of groups, the maximum differences are observed in the period from birth to 3 months of age, which are higher in bulls of the 1st and 2nd experimental groups, respectively, 5.19% and 2.44%, than in the peers of the control group. In subsequent periods of cultivation, they are practical, between groups do not differ significantly.

It is noted that the relative growth rate decreases with age. In our experience, there is also a general trend for all groups towards a decrease in the relative growth rate.

The change in live weight in different age periods does not fully reflect all the features of the growth and development of young animals. For a complete characterization and constitution of animals, it is necessary to know with what regularity the body dimensions change, due to which organs and parts of the body the increase in live weight occurs.

It has been established that in the process of ontogenesis, individual measurements in animals increase unevenly. In cattle, due to the large development in the uterine period of the peripheral part of the skeleton, by the time of birth, the maximum value is reached by height measurements. In the postnatal period, altitude measurements increase less intensively than latitudinal ones. During this period, the axial part of the skeleton grows much faster than the peripheral part.

It is known that there are certain connections between body shapes and inductivity. According to external forms, it is possible to assess the meat qualities of animals with sufficient reliability. Therefore,

with the study of animal meat, we also studied measurements that reflect the general development of the skeleton and body shape.

Analysis of the material obtained showed that with age, in all experimental bulls, the latitudinal measurements increased more than the height measurements.

The study of the linear growth of experimental bulls showed that in all compared groups there is a general pattern. With age, they become short-legged, broad-bodied, the back from the withers to the tail is even, their meat characteristics are more well expressed.

Thus, rearing bull-calves of the red-steppe breed in light-weight buildings, in individual houses and on sites in the conditions of Uzbekistan makes it possible to increase the average daily germination and live weight of bull-calves with the same feeding.

4. Conclusions

The most important condition for increasing beef production and improving their quality is the maximum preservation of newborn calves and reducing the incidence of animals by increasing their natural resistance. One of the promising directions is the introduction of the method of year-round rearing of calves in light-weight premises and individual cages and in houses, and then in open areas. As a result, the waste of calves is reduced in the farms, colibacillosis diseases almost completely stop, the incidence of the respiratory and digestive organs of animals is significantly reduced.

The organization of the "cold" method of rearing young cattle at all stages of production provided an active increase in the productivity of livestock and biological potential compared to the corresponding ones obtained under conditions of growing calves by a mixed method;

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