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Factors Affecting the Formation of Meat Productivity in Simmental Bulls

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Abstract: The article provides brief information about the influence of various phenotypic and genotypic factors on the formation of meat productivity of Simmental cattle. In the table, the amount of digestible protein in the feed actually consumed by Simmental bulls during the experiment was 460.6 kg, 116 grams of digestible protein corresponded to 11 kg of feed unit.

Keywords: Genetic factors, feeding, meat quality, weight and body growth, sex, and age

Introduction: The Program aimed at developing the livestock sector and its branches in the Republic of Uzbekistan for the years 2022-2026 (hereinafter referred to as the Program) is focused on rapidly advancing the livestock sector, ensuring stable food provision for the population, and expanding production capabilities. A decree by the President of the Republic of Uzbekistan regarding the introduction of advanced digital technologies in agriculture, Decree No. PQ-257, was adopted on 02.08.2023 and came into effect on 03.08.2023. The goal is to ensure food security by increasing livestock production, implementing modern production methods, creating value-added chains, fostering cooperation, providing state support for the livestock sector and its branches, and effectively utilizing modern information and communication technologies and scientific advancements in the sector. Historically, cattle breeding in the territory of Uzbekistan developed under intensive conditions and through grazing methods. Until the late 19th century, the majority of livestock consisted of low-yielding, small-bodied native cattle and zebu-type cattle. From the 1920s onward, efforts were made to form productive herds by crossbreeding native and zebu cattle with breeds such as the Black-Ola, Red-Chol, and Swiss cattle. The establishment of breeding farms for purebred livestock, the development of state and cooperative farms, and the establishment of dairy farms and dairy complexes based on industrial technologies took place. As a result, by the 1980s, 98-99% of cattle were purebred. Dairy cows producing 3800-4100 kg of milk were established, and the weight of beef cattle raised in the fattening complexes increased to 400-420 kg by 12-13 months of age. The cattle fattening enterprises established in the districts showed positive results. Advanced



experience and scientific achievements played a significant role in the development of cattle breeding practices.

1. According to T. Nosirov and others (2008), in improving dairy cattle breeds and creating high-yielding herds, it is important to widely use breeding bulls with evaluated hereditary qualities in order to enhance the genetic quality of the offspring.

2. A.A. Khushvakhtov (2007) studied the growth, development, meat productivity, and meat quality of Black-Ola cattle and their crosses with Holstein cattle under the conditions of the Zarafshan region. The results showed that the live weight of purebred Black-Ola cattle at 21 months was 464.3 kg, while the respective figures for first and second-generation crossbred cattle were 506.1 kg and 521.3 kg.

The genetic potential for meat productivity in fattening cattle is influenced by many factors. To meet the nutritional needs of the animals and increase their productivity, it is essential to account for feed units, energy exchange, dry matter, crude protein, digestible protein, crude fat, crude fiber, nitrogen-free extractive materials (AEM), calcium, phosphorus, and other nutritional elements in their diets. One of the most important nutrients in the development of tissues and organs in growing cattle is protein. As the animals age, the protein consumption per unit of live weight decreases. When protein levels in the diet are insufficient, animals do not consume enough feed, leading to slower growth and development. Conversely, excessive protein in the diet negatively affects appetite and growth. The reason for this is that most nitrogen is excreted through manure and urine. In such cases, the protein content in live weight increases, while fat decreases. To avoid these negative consequences, we focused on the digestible protein content when feeding the cattle.

During the experiment, the actual digestible protein consumed by the cattle was 460.6 kg, with 116 grams of digestible protein per 11 kg of feed units. In Groups II and III, the respective figures were 466.2 kg and 481.7 kg, with 115 grams and 117 grams of digestible protein, respectively. In terms of digestible protein, Group III was 21.1 kg (4.6%) and 15.5 kg (3.3%) behind Groups I and II.

In organizing the complete nutrition of the animals, we also considered the exchange of energy, carbohydrates, and minerals, as well as the relationships between certain elements in metabolic processes, their absorption and excretion rates, and their accumulation characteristics in the body. The data obtained from our research align with the standards recommended by A.P. Kalashnikov et al. (1986), and R. Hamroqulov and K. Karibayev (1999).

The feed provided to the experimental cattle differed not only in quantity but also in the nutritional composition. This can be seen in the data from Table 3.1.2.

Table 3.1.2

Composition of the Calf's Ration (In terms of percentage of nutritional content)

Groups



Feeds	I	II	III
Fatty milk	2,7	2,7	2,7
Alfalfa (Lucerne)	19,9	19,7	19,9
Green corn	4,3	4,3	4,4
Silage	8,3	8,8	9,5
Corn silage	5,3	5,3	5,2
Haylage	1,6	1,5	1,5
Alfalfa hay	13,7	13,6	13,4
Natural hay	4,4	4,3	4,2
Cottonseed meal	12,1	12,3	12,1
Mixed feed	27,7	27,5	27,2
TOTAL	100,0	100,0	100,0

The consumption levels of feeds such as fatty milk, haylage, alfalfa hay, and mixed feed were almost identical across all groups, whereas differences were observed between groups in the consumption of feeds such as alfalfa, green corn, silage, and cottonseed meal. In total, during the experiment, the consumption rate of the feeds included in the diet ranged from 84% to 100%. The consumed feed was distributed in all groups as follows: 2.7%, 2.7%, and 2.6% were from milk products, 43.4%, 42.3%, and 43.1% were from green and juicy feeds, 30.2%, 30.1%, and 29.8% were from coarse feeds, and 27.7%, 27.5%, and 27.2% were from concentrate feeds. As seen, the main part of the diet consisted of green and juicy feeds, as these types of feeds are rich in carotene, essential amino acids, easily fermentable carbohydrates, vitamins, macro and microelements, and compounds like estrogen.

In meat production, the role of concentrate feeds is significant when feeding cattle according to standards to ensure quality meat production. Therefore, we regulated the amount of concentrate feeds in the diet, taking into account the animals' growth stages. For example, in terms of nutritional value, concentrate feeds constituted about 18.0–19.0% of the total consumed feed during the early growth stage (up to 6 months old), and this value doubled to 36-37% by the end of the experiment, during the final fattening phase.

In general, there was no significant difference between the groups in terms of the composition of the diet, which indicates that the feeding conditions were the same for all groups. Therefore, in our research, cattle from the Simmental crossbred groups consumed feeds with significantly higher nutritional value compared to their counterparts from the purebred black cattle groups during the experiment. This served as a critical factor in ensuring rapid growth and high productivity.

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