СЕКЦІЯ 33.
ТВАРИННИЦТВО, АКВАКУЛЬТУРА ТА ДОБРОБУТ ТВАРИН

Halaktenov Dmytro Oleksandrovych, higher education student at the Faculty of Biotechnology
Dnipro State Agrarian and Economic University; Ukraine

Malushchenko Vladyslav Oleksandrovych, higher education student at the Faculty of Biotechnology
Dnipro State Agrarian and Economic University; Ukraine

Pushkarnykh Valerii Serhiiovych, higher education student at the Faculty of Biotechnology
Dnipro State Agrarian and Economic University; Ukraine

Scientific supervisor: Pryshedko Volodymyr Mykhailovych, candidate of agricultural sciences, associate professor, associate professor of the Department of Animal Feeding and Breeding Technology
Dnipro State Agrarian and Economic University; Ukraine

FORMATION OF PRODUCTIVE QUALITIES AND FEED CONVERSION EFFICIENCY IN YOUNG ABERDEEN-ANGUS CATTLE DEPENDING ON SEASONAL FATTENING FACTORS

Providing the population with high-quality beef is one of the key tasks of Ukraine's agro-industrial complex. Specialized beef cattle breeding is based on the efficient transformation of roughage and pasture forage into biologically valuable food products. Aberdeen-Angus cattle represent an outstanding gene pool of beef cattle breeding, characterized by rapid growth rates, endurance, excellent feed conversion efficiency, and carcass traits with pronounced intramuscular marbling [5-8]. However, the realization of the genetic potential of animals of this breed in the conditions of the Northern Steppe of Ukraine significantly depends on seasonal factors, microclimatic conditions, and diet structure [1-4]. In view of this, the objective of the research work was to conduct a comprehensive assessment of growth intensity, feed expenditure and conversion, slaughter traits, and chemical composition of meat in young Aberdeen-Angus cattle under different seasonal housing and fattening regimes on a farm in Kamianske District, Dnipropetrovsk Region.

The 180-day scientific and practical experiment was conducted on two groups of Aberdeen-Angus bulls (23 head in each), formed after weaning at 7 months of age using the analogue-group method.

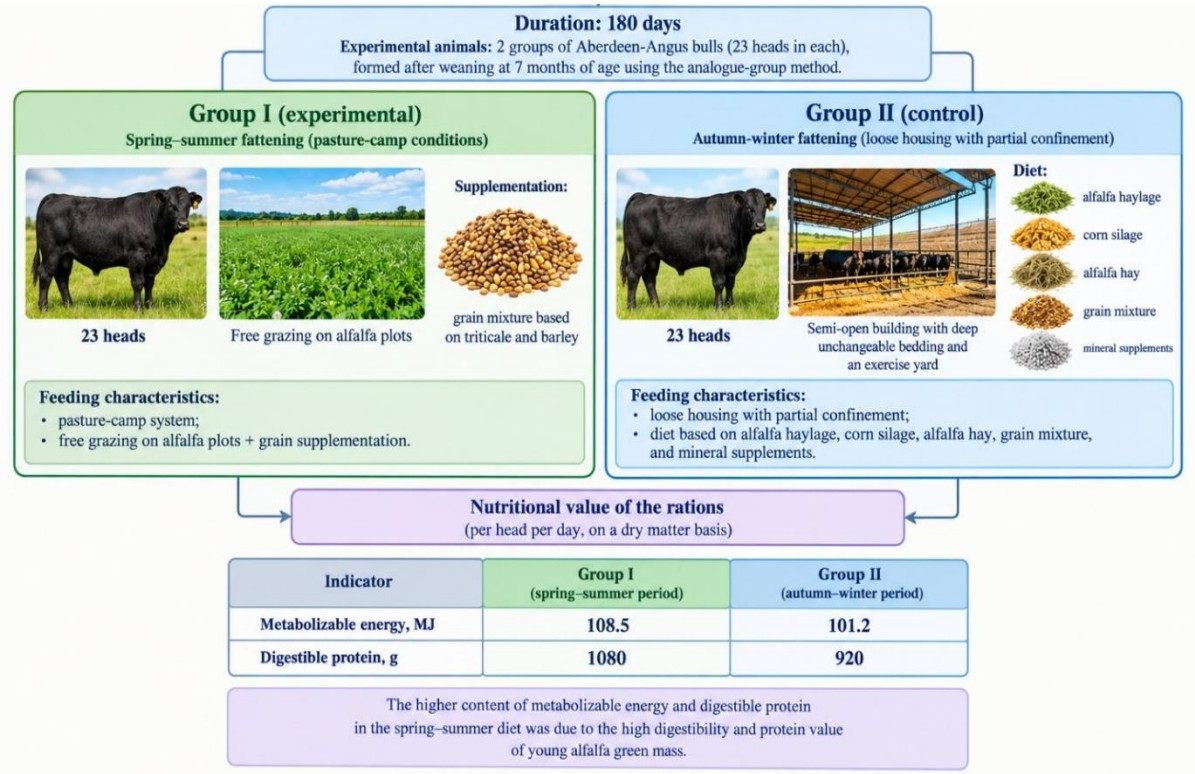


Fig. 1. **Experimental design of a 180-day scientific and practical trial on Aberdeen-Angus bulls**

The first group of experimental young stock was fattened during the spring-summer period under pasture-camp conditions with free grazing on alfalfa plots and supplementation with a grain mixture based on triticale and barley. The second group underwent fattening during the autumn-winter period under loose pen housing conditions in a semi-open building with deep unchangeable bedding and an exercise yard, consuming a diet consisting of alfalfa haylage, corn silage, alfalfa hay, grain mixture, and mineral supplements. In terms of nutritional value, the spring-summer fattening diet was characterized by a higher content of metabolizable energy (108.5 MJ vs. 101.2 MJ) and digestible protein (1080 g vs. 920 g per head per day), which was due to the high digestibility and protein value of young alfalfa green mass.

The analysis of live weight age dynamics and growth intensity demonstrated significant advantages of pasture-camp housing during the warm period of the year. The final live weight of the first group of bulls at 18–19 months of age reached 585.4 kg, which was 43.2 kg (or 8.0%, $p < 0.001$) higher than that of the second group (542.2 kg). The gross live weight gain over the 180 days of the experiment was 186.8 kg in the first group compared to 163.4 kg in the second group. The average daily gain of the spring-summer fattened animals was 1038 g, exceeding their autumn-winter counterparts (908 g) by 130 g/day, or 14.3% ($p < 0.001$). The study of nutrient conversion efficiency showed that the first-group bulls expended 6.8 feed units and 750 g of digestible protein per 1 kg of live weight gain, whereas the second-group animals required 7.8 feed units and 810 g of digestible protein. The reduction in feed consumption by 1.0 feed unit (by 12.8%) and digestible protein by 60 g (by 7.4%) was achieved due to the high biological value of green mass protein and the absence of significant net dietary energy expenditure on thermoregulation.

The results of the test slaughter of the experimental young cattle confirmed superior slaughter and carcass performance under pasture-camp management.

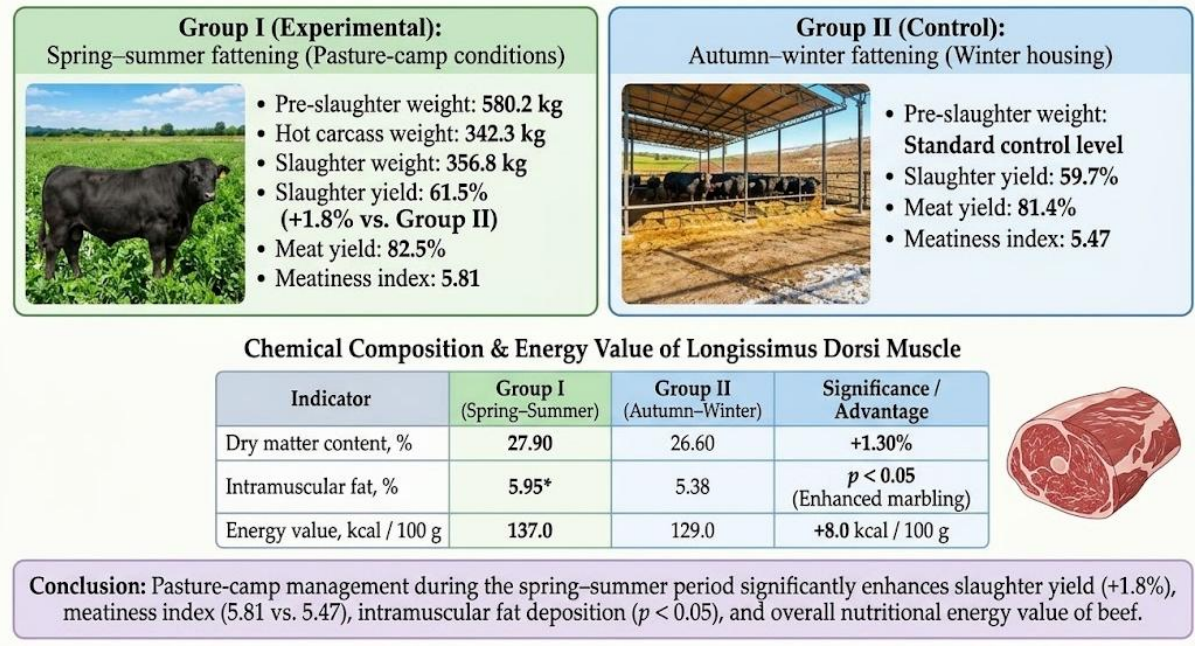


Fig. 2. **Comparative evaluation of slaughter performance, carcass morphological traits, and chemical composition of the longissimus dorsi muscle in young cattle under pasture-camp (spring–summer) and winter fattening**

systems ($p < 0.05$)

The pre-slaughter weight of the first-group bulls was 580.2 kg, hot carcass weight was 342.3 kg, slaughter weight reached 356.8 kg, and slaughter yield reached 61.5%, which was 1.8% higher than the value for winter-fattened animals (59.7%). Morphological carcass analysis revealed a higher meat yield in the first-group carcasses (82.5% vs. 81.4%) and a higher meatiness index (5.81 vs. 5.47). The study of the chemical composition of the *longissimus dorsi* muscle showed that the muscle tissue of spring-summer fattened bulls was characterized by a higher dry matter content (27.90% vs. 26.60%) and intramuscular fat content (5.95% vs. 5.38%, $p < 0.05$), providing pronounced marbling of the beef and an energy value of 137.0 kcal/100 g compared to 129.0 kcal/100 g in the second group.

The economic evaluation revealed that using inexpensive alfalfa green mass and reducing the proportion of harvested preserved forage lowered the production cost per 100 kg of live weight gain in the first-group bulls by 19.8% compared to the second group. Net profit per head was 2,632.9 relative units versus 763.6 relative units, and the profitability level of weight gain production increased from 9.5% in the winter period to 36.6% in the spring-summer period (an increase of +27.1%).

Thus, pasture-camp fattening of young Aberdeen-Angus cattle during the warm period of the year ensures maximum realization of the genetic potential for beef productivity, high feed conversion efficiency, and economic profitability. For commercial production, it is recommended to schedule the slaughter of young beef cattle in late autumn following a 180-day cycle of spring-summer pasture-camp management upon reaching a live weight of 580–600 kg at 18–19 months of age.

References

1. Chernenko, O., Prishedko, V., Chernenko, O., Mylostyvyi, R., Shulzhenko, N., & Bordunova, O. (2023). Comparison of morphometric and histological properties of testicles and sperm production in breeding bulls with different reaction to stress. *Veterinarska stanica*, *54*(2), 193-209.

2. Kozyr, V., Mykytiuk, V., Kalinichenko, O., Pryshedko, V., & Begma, N. (2023). Growth energy and quality of beef from bulls of Maine-Anjou, Chianina, and Santa Gertrudis breeds grown in Ukraine.
3. Mylostyvyi, R., Kalinichenko, O., Skliarov, P., Lesnovskay, O., Karlova, L., Begma, N., ... & Izhboldina, O. (2021). The influence of the season on the efficiency of fertilization and the manifestation of postpartum pathology in dairy cows. *Ukrainian Journal of Ecology*, *11*(4), 81-86.
4. Pryshedko, V. (2024). Selection-biotechnological approaches in solving problems of dairy cattle reproduction under conditions of heat stress. European Science, (sge35-02), 72-109.
5. Богданов Г. О., Євстаф'єв С. М., Клименко М. О. Годівля м'ясної худоби та якість яловичини : монографія. Київ : Аграрна наука, 2019. 220 с.
6. ДСТУ 3938-99. М'ясна промисловість. Продукція забою худоби. Терміни та визначення поняття. [Чинний від 2000-07-01]. Київ : Держстандарт України, 2000. 32 с.
7. Зубець М. В., Буркат В. П., Єфіменко М. Я. Генетика і розведення м'ясної худоби : навчальний посібник. Київ : Урожай, 2016. 312 с.
8. Козирь В. І., Свічур О. В. М'ясне скотарство України: стан, проблеми та наукове забезпечення розвитку : монографія. Дніпро : Пороги, 2018. 384 с.