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ПРОМЫШЛЕННОЕ СКРЕЩИВАНИЕ КОРОВ МОЛОЧНОГО СКОТА С БЫКАМИ МЯСНЫХ ПОРОД В ЗАПАДНОЙ СИБИРИ

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Представлены результаты промышленного скрещивания коров молочного скота с быками мясных пород. Научно-хозяйственные опыты проведены в Омской и Новосибирской областях. Для эксперимента отобраны выранжированные коровы красной степной породы, которых искусственно осеменили семенем быков красной степной, калмыцкой и герефордской пород. От народившихся телят по методу групп-аналогов отобрали бычков каждого генотипа и сформировали три группы: 1-я контрольная – красные степные, 2-я опытная – помеси калмыцкая × красная степная, 3-я опытная – помеси герефордская × красная степная. Во втором опыте из бычков-кастратов симментальской породы и герефорд × симментальских помесей сформированы две группы: 1-я контрольная симментальской породы и 2-я опытная герефорд × симментальские помеси. Выявлено высокодостоверное превосходство по живой массе молодняка 2-й и 3-й опытных групп. С 9- и до 15-месячного возраста по сравнению с контрольными животными оно составило 16,5–77,3 кг ($p < 0,05$–$0,001$). У помесей группы красная степная × герефордская убойный выход составил 58,6%, что выше, чем у сверстников двух первых групп, на 1,9 и 1,8% ($p < 0,05$), масса туши 209,3 кг, у красных степных – 172,2 кг ($p < 0,01$). Во втором опыте в возрасте 8, 12, 15 и 18 мес бычки 2-й опытной группы превосходили сверстников 1-й контрольной на 15,2–29,4 кг ($p < 0,05$–$0,001$). Убойный выход у опытного молодняка был выше, чем у контрольного, – 57,8%. По двум опытам помесные группы животных характеризовались лучшей мясной продуктивностью. Промышленное скрещивание коров молочного скота с быками мясных пород позволит повысить мясную продуктивность и увеличить поголовье мясного скота.

Ключевые слова: промышленное скрещивание, мясная продуктивность, порода, живая масса

COMMERCIAL CROSS BREEDING OF DAIRY CATTLE WITH BEEF BULLS IN WESTERN SIBERIA

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The results of commercial cross breeding of dairy cattle with meat bulls are presented. Scientific and economic experiments were carried out in Omsk and Novosibirsk regions. Ranked cows of the red steppe breed were selected for the experiment. They were artificially inseminated with the semen of bulls of the red steppe, Kalmyk and Hereford breeds. Bulls of each genotype were selected from the calves born and three groups were formed by the method of analogue groups: 1st control – the red steppe, 2nd experimental – crossbreed of Kalmyk × the red steppe, 3d experimental – crossbreed

of Hereford × the red steppe. In the second experiment two groups were formed from castrated bulls of Simmental and Hereford breeds × Simmental hybrids: 1st control group of Simmental breed, 2nd experimental group – Hereford × Simmental hybrids. A highly reliable superiority in the live weight of young animals of the 2nd and 3d experimental groups was revealed. From the age of 9 to 15 months, it was 16.5–77.3 kg ($p < 0.05$–0.001) compared to animals in the control group. In the group of the red steppe × Hereford, slaughter yield was 58.6%, which is higher than that of the first two groups, by 1.9 and 1.8% ($p < 0.05$), the carcass weight was 209.3 kg, the red steppe – 172.2 kg ($p < 0.01$). In the second experiment at the age of 8, 12, 15 and 18 months, the bulls of the 2nd experimental group outperformed the peers of the 1st control group by 15.2–29.4 kg ($p < 0.05$–0.001). Their slaughter yield was higher than that of the control group, and accounted for 57.8%. In two experiments, crossbred groups of animals were characterized by a better meat productivity. Commercial crossbreeding of dairy cows with beef breeds of bulls allows to increase meat productivity and increase the population of the meat cattle.

Keywords: commercial crossbreeding, meet productivity, breed, live weight

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The authors declare no conflicts of interest.

INTRODUCTION

The development of the specialized meat cattle industry in Russia is a priority task of the agricultural sector. From 2010 to 2019, the production of large cattle for slaughter in live weight decreased from 3030.0 thousand tons up to 2827.1 thousand tons or 202.9 thousand tons (-6.7%), which is the result of the reduction in the number of dairy cows and over-represented young cattle in the share of fattening cattle[1] [1]. According to experts, they can only be replaced by animals of beef breed. According to forecasts, by 2025 the number of beef cattle of specialized beef breeds should be 10 million heads. [2]. The development of beef breeds occurs both when using reputable and foreign species, as a rule, regionalized to the conditions of a specific region [3–10].

It should be noted that it takes a long time to increase the number of beef cattle through own reproduction, and it is very expensive to buy animals from other countries. In this connection, we consider it expedient for Siberian producers to use selected (culled) dairy cows for industrial crossbreeding with bulls of beef breeds. This will make it possible to create a contingent of crossbred herds for beef production in contrast to purebred beef cattle [11-15]. The potential for beef cattle breeding in Siberia with its vast agricultural land is very high, so beef cattle breeding can become a profitable industry.

The aim of the study was to examine the productive features and meat qualities of young cows from industrial crossbreeding of bred dairy cows with bulls of specialized meat breeds in Western Siberia.

[1]Dunin I.M., Butusov D.V., Shichkin G.I., Safina G.F., Chernov V.V., Lastochkina O.V., Tyapugin S.E., Bogolyubova L.P., Nikitina S V.V., Matveeva E.A., Tyapugin E.E. The state of meat cattle breeding in the Russian Federation. Yearbook of pedigree work in meat cattle breeding in the farms of the Russian Federation, 2019. Moscow, 2020, 3 p.

MATERIALS AND METHODS

Two research experiments have been conducted. The first one was carried out in APC "Uraly" of the Omsk region by commercial crossbreeding of red steppe cows with Kalmyk and Hereford bulls to increase the quantity and improve the quality of beef in the farms of the tundra northern zone of Western Siberia. For this purpose, 62 red steppe cows were selected and then artificially inseminated with semen from red steppe, Kalmyk and Hereford bulls.

From the 60 calves born, 30 steers of 10 animals of each genotype were selected. Three groups were formed using the method of peer groups: 1st control - red steppe, 2nd experimental group - Kalmykian × red steppe, 3rd experimental group - Hereford × red steppe.

The second experiment was conducted in ZAO Kozinskoe, Novosibirsk Region on steer cattle of Simmental breed and Hereford × Simmental mixtures. Two groups of 10 animals each were formed: the 1st (control) of Simmental breed, and the 2nd (experimental) of Hereford × Simmental mixtures. Feeding and maintenance of the young animals in both experiments were the same. The steers were weighed monthly in the morning before feeding. The dynamics of their live weight were determined up to 15 months of age in the first experiment and up to 18 months of age in the second.

VASKHNIL, VIZH and VNIIMP methods were used to study the meat productivity and meat quality. For this purpose, control slaughter of steers was conducted at 15-months of age, 3 animals from each group in the first experiment and at 18-months of age in the second experiment. Pre-slaughter weight, carcass weight, carcass yield, weight of internal fat, slaughter weight and slaughter yield were taken into account. The data were processed by the method of variation statistics using the Snedecor software.

RESULTS AND DISCUSSION

The influence of Hereford and Kalmyk bulls in cross-breeding with red steppe cows on the variations of live-weight of young animals in the age dynamics during their breeding from 9- to 15-months of age has been established. At birth bulls of the red steppe breed and crossbreds of the 2nd group had almost the same weight (26,0 and 27,2 kg) in contrast to the 3rd group. The live weight of Group 3 steers was 2.7 kg more than that of Group 1 and 1.5 kg more than Group 2 ($p < 0.05$) (see Table 1).

The difference in live weight in the benefit of the place in comparison with the peers of the control group was especially significant after weaning from mothers. From this age and up to 15 months, the differences between the 2nd and 3rd groups in comparison with the control high are excellent. At the same time, a more intensive increase in live weight took place in mixed bred cattle. The differences in the 1st control and 2nd experimental groups by 15 months amounted to 41.6 kg in favor of the experimental animals, in the 1st and 3rd - 52.6 kg ($p < 0.001$). Probably, the high unpretentiousness of the Hereford crosses to keeping conditions in winter and early spring periods deter-

Табл. 1. Динамика живой массы бычков, кг ($M \pm m$)
Table. 1. Dynamics of live weight of bulls, kg ($M \pm m$)

Age, months	Group (n = 10)		
	1-st	2-nd	3-rd
At birth	26,0 ± 0,82	27,2 ± 0,73	28,7 ± 0,87^{*1}
9	219,8 ± 3,75	236,3 ± 5,92^{*1}	244,5 ± 2,36^{***1}
12	273,6 ± 5,46	296,0 ± 6,67^{*1}	317,8 ± 3,80^{***1*2}
15	333,5 ± 6,82	375,1 ± 4,92^{***1}	386,1 ± 4,13^{***1}

Hereinafter: 1, 2 - means the group number.
*$p < 0,05$.
**$p < 0,01$.
*** $p < 0,001$.

mined a higher rate of live weight gain of steers of the 3rd group.

To determine the slaughter performance of young red steppe bulls and their mixtures with Kalmyk and Hereford bulls, control bulls were slaughtered at the age of 15 months. Three bulls from each group were selected for slaughter, with relatively similar live weights and the same fatness before slaughter (see Table 2).

The slaughter yield of crossbred steers of Group 2 was 56.8% and that of Group 3 was 58.6%.

At 15 months of age the carcasses of crossbred Hereford steers were more complete - 209.3 kg, or 55.2%, and those of red steppe steers - 172.2 kg, or 52.6%.

The weight of the paired carcass of Kalmyk mixed breeds was 197.0 kg, which was higher than that of their red steppe counterparts. In general, the slaughter yield of Kalmyk mixed bred bulls was equal to that of red steppe peers (56.7% and 56.8%). In red steppe x Hereford steppe bulls, the slaughter yield was 58.6%, which was 1.9% and 1.8% higher than in the first two groups, respectively.

In the second experiment, at the age of 8 months, the bulls of the 2nd experimental group excelled in the live weight of the counterparts of the 1st control by 22.9 kg (10.8%) at $p < 0.001$ (see Table 3).

The tendency for the advancement in the live weight of gobies of the 2nd group by 15.2–29.4 kg ($p < 0.05$–0.001) was observed up to 18 months of age.

The indicators of the meat production of young animals according to the results of the control slaughter of gobies are given in table. 4.

The gobies of the 1st group had a high pre slaughter weight in the experience. They excelled their peers from the 2nd group by 34.1 kg. A similar situation was observed for the slaughter mass and the mass of a pair of carcasses. The advantage in terms of slaughter output was on the side of the bulls of the 2nd group - 57.8%.

CONCLUSION

The results of two scientific and economic experiments showed that crossbred gobies were characterized by the best meat production. Their superiority over control animals in live weight reached 15.8%, in slaughter yield

Табл. 2. Результаты контрольного убоя 15-месячных бычков ($M \pm m$)
Table. 2. Results of the control slaughter of 15-month-old bulls ($M \pm m$)

Indicator	Group		
	1-st	2-nd	3-rd
Live weight, kg: removable	338,0 ± 3,22	378,2 ± 2,49^{***1}	389,0 ± 3,57^{***1*2}
pre-slaughter	327,3 ± 3,15	364,6 ± 2,76^{***1}	379,1 ± 2,61^{***1**2}
Weight, kg: slaughter	186,0 ± 2,31	207,1 ± 2,50^{**1}	222,2 ± 2,23^{***1***2}
Hot carcass	172,2 ± 3,18	197,0 ± 2,15^{**1}	209,3 ± 2,20^{***1**2}
Slaughter yield, %	56,7	56,8	58,6
Carcass yield, %:	52,6	54,0	55,2

Табл. 3. Динамика живой массы симментальских, герефорд × симментальских бычков, кг
Table. 3. Dynamics of live weight of Simmental, Hereford × Simmental bulls, kg

Age, months	Group (n = 10)	
	1-st	2-nd
8	212,2 ± 3,38	235,1 ± 3,78***
12	282,4 ± 5,81	311,8 ± 3,43***
15	328,0 ± 4,36	343,2 ± 5,13*
18	368,3 ± 5,20	397,7 ± 4,52***

Табл. 4. Результаты контрольного убоя подопытных бычков ($M \pm m$)

Table. 4. Results of control slaughter of experimental bulls ($M \pm m$)

Indicator	Group	
	1-st	2-nd
Weight, kg:		
removable	350,6 ± 3,28	382,0 ± 3,45***
pre-slaughter	335,1 ± 4,20	382,3 ± 14,4***
slaughter	184,3 ± 4,26	212,3 ± 3,77***
Hot carcass	170,0 ± 3,19	197,0 ± 4,15***
Yield, %:		
slaughter	55,3	57,8
carcass	50,6	53,6

- up to 2.5%. In our opinion, it is necessary to make wider use of industrial crossbreeding of selected (culled) dairy cows with bulls of beef breeds, which will increase meat productivity and increase the number of beef cattle, especially in private subsidiary farms and farming households.

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