

PAPER • OPEN ACCESS

## Beef production of black-and-white breed depending on the degree of fattening

To cite this article: M R Kudrin *et al* 2019 *IOP Conf. Ser.: Earth Environ. Sci.* **315** 072028

View the [article online](#) for updates and enhancements.



**IOP | ebooks™**

Bringing you innovative digital publishing with leading voices to create your essential collection of books in STEM research.

Start exploring the **collection** - download the first chapter of every title for free.

## Beef production of black-and-white breed depending on the degree of fattening

M R Kudrin, S N Izhboldina, K L Shklyayev, V A Nikolaev and N V Selezneva

Izhevsk State Agricultural Academy, Izhevsk, Russia

E-mail: kudrin\_mr@mail.ru

**Abstract.** The studies present the indices of lifetime beef production of fed and non-fed culled cows and young cattle. The research findings showed that the average preslaughter body weight of cows after fattening upon sale to the meat-processing plants was  $696.0 \pm 28.39$  kg, and in cows that were not on feed it was  $567.0 \pm 15.58$  kg, which was 129.2 kg less compared to cows sold after fattening. The average preslaughter body weight of first-calf heifers after fattening when sold to the processing plants was  $474.8 \pm 6.87$  kg, and in first-calf heifers that were not on feed it was  $444.0 \pm 4.29$  kg, which was 30.8 kg less compared to first-calf heifers sold after fattening. The average preslaughter body weight of fattened young cattle when sold to the processing plants was  $400.50 \pm 4.64$  kg, and in young cattle that was not on feed it was  $353.25 \pm 8.43$  kg, which is 47.25 kg less compared to fattened young cattle. Not a single animal met the criteria of “super”, “prima” and “extra” category in terms of the body weight. Preslaughter body weight of studied cows according to age-sex groups also met the criteria for black-and-white cattle breed. Fatness category after fattening of first-calf heifers mainly corresponded to “extra” and “prima” categories, class B and subclass 1, while non-fed first-calf heifers corresponded to “excellent” and “good” category, class G, subclass 1. Fattened young cattle is classified to “good” and “satisfactory” category class G and D, subclass 1 and 2.

### 1. Introduction

Beef cattle breeding is not very wide spread in the Russian Federation. In Russia, this sector is being developed in the pure form only in some regions of the North Caucasus, Kalmykia, Povolzhie, the South Urals, the south of Western Siberia. In many regions of the country this cattle breeding sector is practically not present. The farm units keeping milking herd and getting government support for milk production and sale receive additional profit from culling the milk cows and selling the farm leveler. In the Udmurt Republic and Russia in general there had been selection in the direction of universal usage of beef cattle for many years [1-5]. Our black-and-white cows have always been famous for their fatness compared to Golstinsky breed. Intensive technologies of beef production allow using the beef production biological potential of black-and-white cattle, because the young stock of this breed reach the body weight of 400-450 kg by the age of 15-18 months. The feed costs per 1 kg of weight increase are 6-8 feed units [6-16].

The research was conducted in 2016-2017 on black-and-white breed of “Uromskoe” LLC of Malopurginsky District, Udmurt Republic.

Research objective is to study the beef production criteria within the life period of fed and non-fed cows and young cattle. Ten animals from each group were selected for the study.



In accordance with the established objective the following tasks had been identified:

- to select and measure the body weight of culled cows, first-calf heifers and replacement heifers intended for fattening. To make the weighing list.

## 2. Experimental research

Beef cattle weighing data was taken for the study (adjustable body weight of cows and young cattle).

For assessment of cows and young stock in terms of beef production live parameters have been used. Beef production of animals within the life period was evaluated by weighing according to the following criteria:

- body weight when removed from fattening;
- preslaughter body weight.

There is no preslaughter fasting period (24 hours) at the farm, for this reason a 3% discount is provided by the processing plant.

For research purposes commercial invoices (Form N SP-32 (1skh-zhiv)), accounting statements were used. Mathematical data processing was conducted.

We have studied the beef production parameters of cows and young cattle during the life in accordance with the requirements of GOST R-54315-2011- Cattle for slaughter. Beef and veal carcasses, semi-carcasses and quarters. Specifications.

## 3. Results and considerations

The research findings showed that the average preslaughter body weight of cows after fattening upon sale to the processing plants was  $696.0 \pm 28.39$  kg, and in cows that were not on feed it was  $567.0 \pm 15.58$  kg, which is 129.2 kg less compared to cows sold after fattening (tables 1, 2).

Thus, fatness category after cows fattening belonged to I category, and in those who were not fed – to the II category.

**Table 1.** Body weight parameters of mature cattle (cows after having two or more calves) after fattening (n=10).

Age-sex group	Adjustable body weight, kg	Preslaughter body weight, kg	Discount 3%, kg	Fatness category (I or II)	Classification
					Mature cattle - cows (MC)
Cows on feeding	$717.0 \pm 29.22$	$696.0 \pm 28.39$	$21.0 \pm 0.84$	I	(MC)

**Table 2.** Body weight parameters of mature cattle (cows after having two or more calves) without fattening (n=10).

Age-sex group	Adjustable body weight, kg	Preslaughter body weight, kg	Discount 3%, kg	Fatness category (I or II)	Classification
					Mature cattle - cows (MC)
Cows without fattening	$583.6 \pm 15.77$	$567.0 \pm 15.58$	$16.6 \pm 0.25$	II	(MC)

The average preslaughter body weight of first-calf heifers after fattening when sold to the processing plants was  $474.8 \pm 6.87$  kg, while the first-calf heifers that were not on feed weighted  $444.0 \pm 4.29$  kg, which was 30.8 kg less compared to first-calf heifers sold after fattening (tables 3, 4).

Fatness category after first-calf heifers fattening mainly corresponded to “extra” and “prima” categories, class B and subclass 1, and in non-fed first-calf heifers - to “excellent” and “good” category, class B and G, subclass 1. Not a single animal met “super” and “prima” category criteria due

to low body weight (less than 550 kg). Only one first-calf heifer was classified to “prima” category, since its body weight was 550 kg, which met GOST requirements.

Young cattle category after fattening corresponded to “excellent” and “good” category, class G, subclass 1. Non-fed young cattle was classified to “good” and “satisfactory” category, class G and D, subclass 1 and 2.

**Table 3.** Body weight parameters of first-calf heifers (young heifers having the first calf) after fattening (n=10).

Age-sex group	Adjustable body weight, kg	Preslaughter body weight, kg	Discount 3%, kg	Requirements (lower limits) by body weight, kg no less	Class	subclass	Classification
				(super - 550 kg, prima - 500, extra - 450, excellent - 400, good - 350, Satisfactory - 300, Low - less than 300 kg)			
First-calf heifers after fattening	489±7.05	474.8±6.87	14.2±0.20	extra, prima	B	I	(MKP)

**Table 4.** Body weight parameters of first-calf heifers (young heifers having the first calf) without fattening (n=10).

Age-sex group	Adjustable body weight, kg	Preslaughter body weight, kg	Discount 3%, kg	Requirements (lower limits) by body weight, kg no less	Class	Subclass	Classification
				(super - 550 kg, prima - 500, extra - 450, excellent - 400, good - 350, satisf. - 300, Low - less than 300 kg)			
First-calf heifers without fattening	457.67±4.51	444.0±4.29	13.67±0.21	excellent	B, G	I	(MKP)

The average preslaughter body weight of the young stock after fattening when sold to the processing plants was 400.50±4.64 kg, and in young cattle that was not on feed it was 353.25±8.43 kg, which was 47.25 kg less compared to fattened young cattle (tables 5, 6). Not a single animal corresponded to “super”, “prima” or “extra” category in terms of the body weight.

Figure 1 shows a comparative analysis of fed and non-fed cattle in terms of the body weight.

#### 4. Conclusion

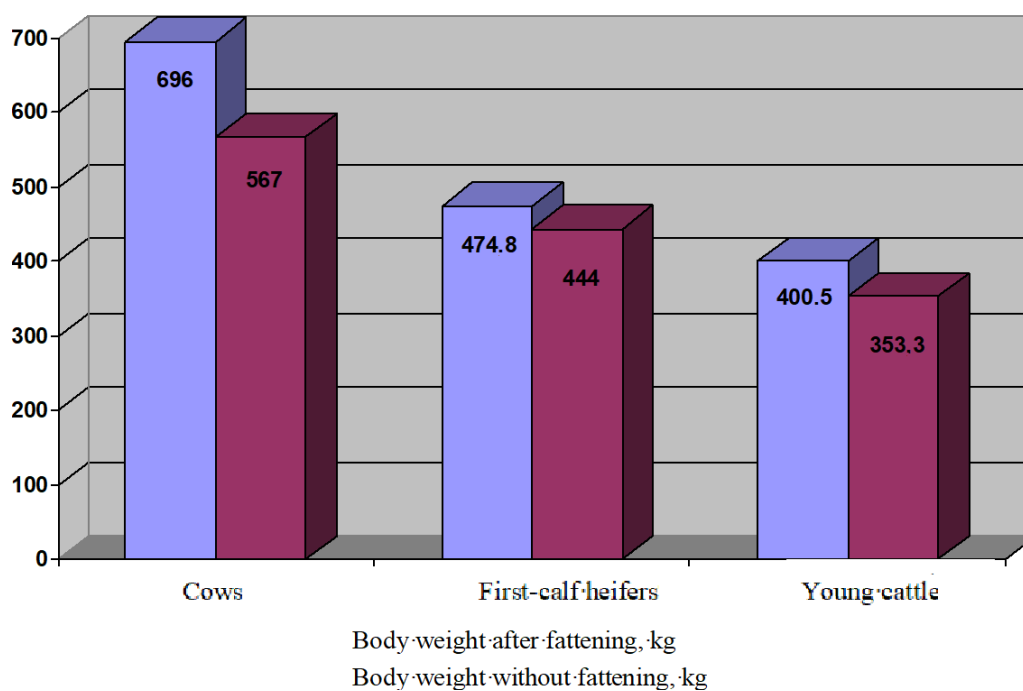
According to the data received during the farm study, it is recommended to fatten all healthy culled cows and young cattle for 2-3 months, in order to improve the body weight category of cows and young cattle.

**Table 5.** Body weight parameters of young cattle (young heifers between the age of 8 months and 3 years old) after fattening (n=10).

Age-sex group	Adjustable body weight, kg	Preslaughter body weight, kg	Discount 3%, kg	Category	Requirements, lower limits		
					CC	Class	Subclass
Young heifers between the age of 8 months and 3 years old	412.3±4.77	400.50±4.64	11.83±0.17	excellent, good	400	G	I

**Table 6.** Body weight parameters of young cattle (young heifers between the age of 8 months and 3 years old) without fattening (n=10).

Age-sex group	Adjustable body weight, kg	Preslaughter body weight, kg	Discount 3%, kg	Category	Requirements, lower limits		
					In terms of body weight, kg	Class	Subclass
Young heifers between the age of 8 months and 3 years old	363.8±8.67	353.25±8.43	10.5±0.29	good, satisfactory	350	G, D	I, II

**Figure 1.** Comparative characteristic of fed and non-fed cattle in terms of the body weight.

## References

- [1] Amerkhanov H A and Strekozov N I 2012 *Milk and Meat Cattle Breeding (Special Edition)* 2-6
- [2] Whipple G et al 1990 *Journal of Animal Science* **68**(9) 2716-28
- [3] Wilkinson J 1996 *Rev. ADAS* **24** 101-14
- [4] Wukf D M et al 1997 *Journal of Animal Science* **75**(2) 3-12
- [5] Xu S et al 1995 *Journal of Animal Science* **73**(3) 699-710
- [6] Baker R 1995 *Simmental Shield* 75-85
- [7] Bougler J 1989 *Proc of 15- th Gen. Mtg. Cong. Europ. Feder. Simmental Besancon* 27-36

- [8] Brownson R M 1975 *Abstr. Intern.* **35(7)** 3199-220
- [9] Cazzoba C Q *et al* 1999 *Anim. Sc.* **69(1)** 135-42
- [10] Deland M 1979 *Agr. Rec.* **6(1)** 14-5
- [11] Hardy R and Meadowcrow S 1990 *Indoor beef production* **2** 1-56
- [12] Kartashov N I and Prudnicov Cherny N V 1998 *Proc of XVIII Nordic veterinary congress* 313-9
- [13] Naazie A *et al* 1989 *Journal of Animal Science* **62(3)** 67-73
- [14] O'Connor S F *et al* 1997 *Journal of Animal Science* **75(7)** 1822-30
- [15] Sanders J O and Cartwright T G 1979 *Agr. Systems* **4(4)** 289-309
- [16] Simek M 1986 *Biol. Chem. zivocisne vyroby* **22(6)** 535-40