

THE INFLUENCE OF THE BEEF BULL BREED ON CARCASS WEIGHT AND YIELD OF MALE OFFSPRING

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Abstract: The aim of this study was to investigate of beef breeds - Hereford (HE), Charolais (CH) Limousine (LI), Simmental (SM), Belgian Blue (BB) and Salers (SA) - of the bulls, which are used for dairy cows and heifers insemination, influence on male sex offspring carcass weight and yield. In this article, for analysis were used of all in 7 months in one slaughterhouse slaughtered bulls 12-30 months of age data. Of these 689 crossbreeds, whose cow was dairy and bull was beef breed. For this study was used only crossbreeds (689 bulls) data. This is the thirty-six (36) bull offspring from 546 farms. Bulls were divided into groups according to age during slaughter (12-18 months, 18-24 months, 24-30 months). Studies have shown, that the father's breed at different growth periods had a different effect on carcass traits of crossbreeds. Therefore, the crossbreeding use on purpose to improve dairy breeds offspring carcass characteristics, it is necessary to carefully choose the right breed for crossbreeding, bearing in mind, what age of the offspring will be slaughtered.

Key words: beef cattle, bulls, offspring, carcass yield

Introduction

In Lithuania most part of the beef is obtained from dairy cattle. Meat composed small part of purebred beef cattle and their crossbreeds. In order to improve meat quality obtained from dairy cattle, crossbreeding is widely carried out of dairy cows in a lower quality of the breeding value with beef breeds bulls.

When animals grow, due to differences in growing intensive individual tissues and organs, carcass yield is increasing. The more muscle and fat tissue in carcass, the better it is (*Wajda et al., 2002; Berg et al., 2003; Alberti et al., 2005*). In order that the bulls to grow quickly and well develop their muscles, they must be

reared intensively. The bulls fairly well fed fastest growing from birth to 12 months of age. The higher weight is of bull and the heavier and better quality is carcass. Carcass yield is carcass weight and of mass before slaughter ratio as a percentage. This is an important indicator of cattle production. Cattle carcass yield and morphological composition depends on the breed, sex, of feeding different periods of growth, of the individual traits of animals, of body condition and age (*Ingr, et al., 1989; Groth et al., 1999, Miller et al., 2002, Jukna et al., 2008*). The largest carcass yield are of beef cattle (67-70 percent). Intensively grown of many dairy breed bulls weigh 450-500 kg and thier carcass yield composed about 54-55 percent. The bulls carcass yield are higher than heifers and heifers - than the cows. The biggest yield of the carcass is from grown-up and good condition animals (*Crews et al., 2003; Pečiulaitis et al., 2007; Jukna et al., 2010*). During the all growing period, abundantly full-fledged rations of fed cattle carcass yield is higher. It has very depends on the animal body condition. Morphological composition of meat depends on individual tissues ratio, the most important are muscle, fat and bone tissues (*Jukna et al., 2006*).

The aim of this study was to investigate of beef breeds - Hereford (HE), Charolais (CH) Limousine (LI), Simmental (SM), Belgian Blue (BB) and Salers (SA) - of the bulls, which are used for dairy cows and heifers insemination, influence on male sex offspring carcass weight and yield.

Material and methods

In this article, for analysis data were used for slaughtered bulls 12-30 months of age during the period of 7 months, in the same conditions. Total of 2233 bulls, which pedigree could be accurately determined, were used. Of these 689 crossbreeds, whose cow was dairy and bull was beef breed. For this study was used only crossbreeds (689 bulls) data. This is the thirty-six (36) bull offspring from 546 farms.

Bulls were divided into groups according to age during slaughter (12-18 months, 18-24 months, 24-30 months). The Belgian Blue breed bulls offspring have not been from 24-30 months age category because the offspring of this breed are usually slaughtered younger (before reaching your desired weight).

Table 1. Breeds used in the study and number of animals

Breed	Number of bull-parent	Number of slaughtered bulls
Hereford	6	85
Charolais	9	196
Limousine	10	268
Beef Simmental	2	28
Belgian Blue	6	30
Salers	3	82
Total	36	689

During slaughter was determined the animal's mass before slaughter, animal weighing, warm carcass mass and carcass yield.

Carcass yield calculated by the following formula: $H = (S * 100) / G$, where H - carcass yield,% S - warm carcass weight, kg G - animal mass until slaughter, kg.

The mean (\bar{X}), the standard error (mx) were calculated for each trait.

The reliability (ρ) of the difference between the arithmetic means of the two groups was determined by Student's (t) criteria.

Data processed with statistical package R, version 2.01. (*Gentlemen, Ihaka, 1997*).

Results and discussion

Studies have shown, that breed of bull's has affected offspring carcass mass and yield. From the data presented in Figure 1 seen, that the bulls grown on 12 to 18 months age carcass mass largest 253.6 ± 2.3 kg was obtained of the Belgian Blue breeds bulls, whereas the least 224.0 ± 2.1 kg Hereford bulls offspring ($p < 0.025$). The difference amounted to 29.6 kg or 13.2 percent. Comparing the bulls groups from 18 to 24 months age difference of carcass mass of heaviness between the groups was determined the least and amounted to only 6.9 percent (as well as between the Belgian Blue and Hereford bulls offspring, $p > 0.05$).

The most notable carcass mass differences were obtained between the groups of bulls in the age period from 24 to 30 months. The largest difference was determined between Charolais and Hereford bulls offspring groups (Belgian Blue breeds bulls offspring were not available in this category). Charolais bulls offspring carcass were 62.2 kg or 29.4 percent heavier than Hereford breeds bulls offspring, ($p < 0.01$). Our research obtained data about beef breed's bull influence of offspring carcass mass and quality coincident with the data of other researchers (*Serra et al., 2004; Ozluturk et al., 2004*).

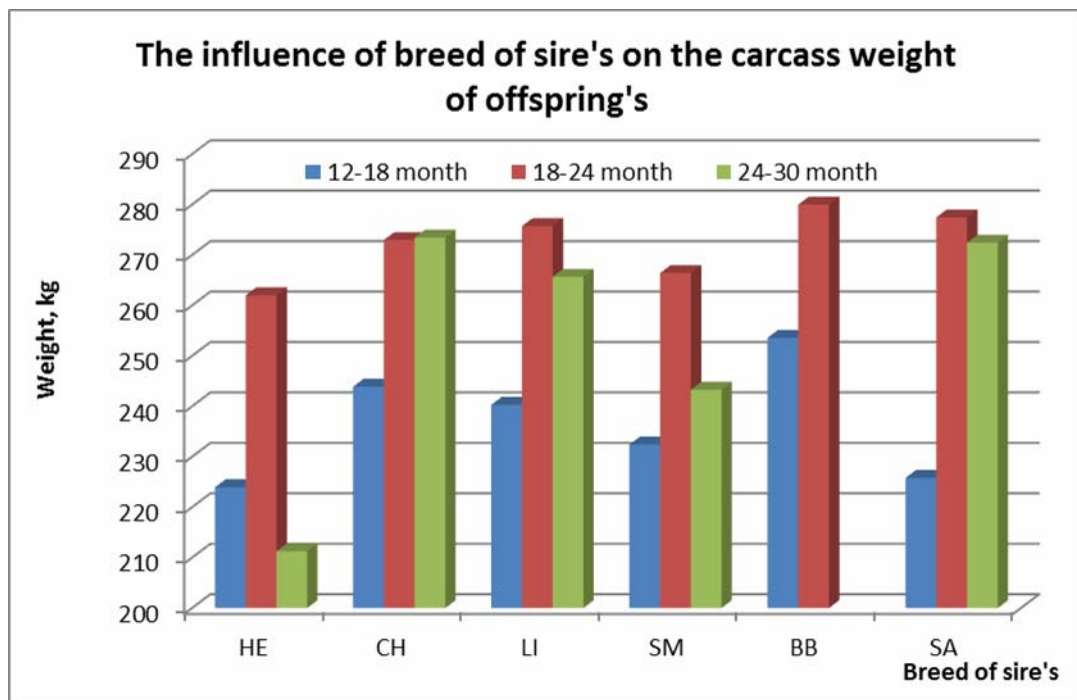


Figure1. The influence of sire breed on the carcass weight of their offspring

From the data presented in Figure 2 seen, that beef breed's bulls influence to offspring carcass yield was also established significant. The bulls have reached from 12 to 18 months age of carcass yield greater was obtained 2.8 percent of Limousine breeds offspring group than in the Belgian Blue and Simmental breeds, $p < 0.01$. The highest differences of carcass yield percent were established from 18 to 24 months in the bulls age group between the Limousine and Hereford breed bulls groups. The difference amounted to 2.3 percent, $p < 0.005$. In other bulls of the same age groups, carcass yield percent obtained the similar. Compared with other age bulls groups, the highest carcass yield percent were found in the age group from 24 to 30 months of Limousine breed and the lowest Simmental. The difference between the Limousine and Simmental crossbreeds were composed 5.1 percent, $p < 0.005$. For crossbreeding using of Hereford, Charolais, Limousine and Salers breeds bulls, the best carcass yield of offspring was obtained slaughter from 18 to 24 months age. While, using for crossbreeding with Belgian Blue breed bulls, offspring carcass yield the best then some offspring reaches from 24 to 30 months age. In this study we determined a significant bull's breed effect on carcass traits of offspring, and this consistent with the data of other researchers (Koch et al., 1989; Jukna Č., Jukna V., 2002; Serra et al., 2004; Levachin et al., 2008).

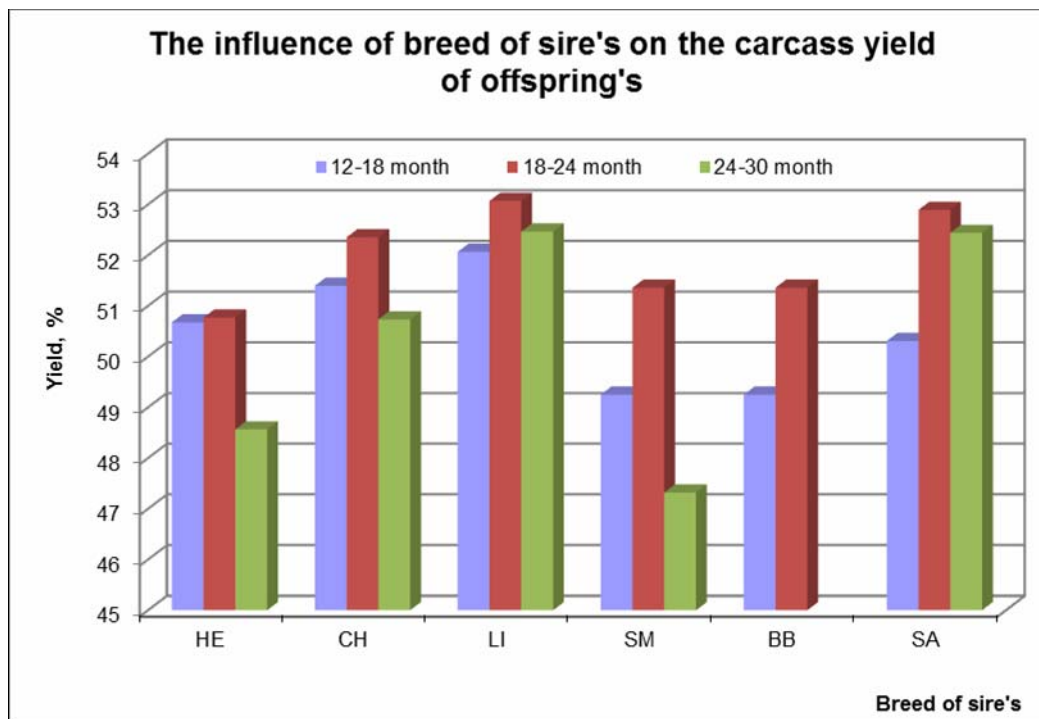


Figure2. The influence of sire breed on the carcass yield of their offspring

Conclusions

To sum up the research data can draw the following conclusions: that the father's breed at different growth periods had a different effect on carcass traits of crossbreeds. Therefore, the crossbreeding use on purpose to improve dairy breeds offspring carcass characteristics, it is necessary to carefully choose the right breed for crossbreeding, bearing in mind, what age of the offspring will be slaughtered.

Uticaj rase priplodnih bikova na težinu trupa i prinos mesa kod muških potomoka

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Rezime

Cilj ovog istraživanja bio je da se ispita rasa bikova - hereford (HE), šarole (CH) limuzina (LI), simental (SM), belgijska plava (BB) i salers (SA) - koje se koriste za odgoj mlečnih krava i junica u osemenjavanju, uticaj na muške potomke, odnosno težinu trupa i prinos mesa/randman. U ovom radu, za analizu su korišćeni podaci za zaklana goveda starosti 12-30 meseci u periodu od 7 meseci, dobijeni u jednoj klanici. U ispitivanje je uključeno 689 meleza, čije majke su bile mlečne krava a očevi, bikovi tovnih rasa. U ovom istraživanju su korišćeni samo podaci za meleze (689 junadi), odnosno potomstvo trideset šest (36) bikova sa 546 farme. Bikovi su bili podeljeni u grupe prema uzrastu prilikom klanja (12-18 meseci, 18-24 meseci, 24-30 meseci).

Istraživanja su pokazala, da je očeva rasa u različitim periodima rasta imali drugačiji uticaj na osobine trupa meleza. Dakle, upotreba ukrštanja za ciljano poboljšanje karakteristika trupa potomstva mlečnih rasa, potrebno je pažljivo odabrati pravu rasu za ukrštanje, imajući u vidu starost odn. uzrast potomaka pri klanju.

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