Growth and carcass traits of young bulls sired by Charolais and Limousin

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ABSTRACT - A brown cattle is dual purpose cattle in Slovenia mainly used for milk production. This study included 90 crossbred young bulls of two genotypes, 70 Brown x Limousin (BRxLIM) and 20 Brown x Charolais (BRxCHA). The aim of this study was to determine some growth and carcass characteristics of crossbred young bulls. Data were analysed by GLM procedure considering sire breed and year nested within sire breed as fixed effects and slaughter age as linear regression. Sire breed statistically significantly affected slaughter weight, hot carcass weight, net daily gain, dressing percentage and index of conformation. All three included effects statistically significantly affected only slaughter weight, hot carcass weight and net daily gain.

Key words: Crossbred bulls, Growth traits, Carcass traits.

Introduction – Brown cattle is dual purpose cattle in Slovenia mainly used for market milk production and, also in some farms, for processing milk into cheese and other products. A lot of farmers with small sized herds of Brown cattle have abandoned market milk production in the last few years. They have decided for beef production and they changed to cow-calf rearing system on pastures. Brown cows have good maternal characteristic and enough milk for their calves. Weaned calves are suitable for intensive fattening or pasture rearing. Beef breeds such as Limousin, Belgian Blue, and Charolais are mainly used as sire breeds in Slovenia for industrial crossbreeding. Since the year 2002 Brown x Charolais and Brown x Limousin young bulls have been included in the progeny test station where their growth trait parameters have been measured. After the slaughter the carcass characteristic were also recorded. The aim of this study was to determine some growth and carcass characteristics of these crossbreeds.

Material and methods – This study included 90 crossbred young bulls of two genotypes, 70 Brown x Limousin (BRxLIM) and 20 Brown x Charolais (BRxCHA). BRxLIM were progeny of eight, and BRxCHA of five sires. Young bulls were moved to the test station at the Educational and Research Animal Husbandry Centre Logatec (Slovenia) from the years 2002 to 2007 at the average age of 55.1 days (BRxCHA – 54.5 days, BRxLIM – 55.2 days) and the average body weight of 115.0kg. Bulls were fed with grass ensilage, hay and concentrates. Slaughter age was 540 days in average (BRxCHA – 508 days, BRxLIM – 550
days). Bulls at the test station were weighted every two months, but only the starting and slaughter weights were considered. Weight at 200 days was computed with interpolation. Daily gain was calculated from the body weights and age. After the slaughter, hot carcass weight, carcass length and chest depth were recorded. Carcass conformation and fatness were scored according to the EUROP system. Net daily gain was calculated from hot carcass weight and age at slaughter. Dressing percentage was calculated from hot carcass weight and slaughter weight, while index of conformation (IC) was calculated from hot carcass weight (CW), carcass length (CL) and chest depth (CD) as IC = CW/(CL*CD). Data were analysed by GLM procedure of statistical package SAS/STAT (SAS Institute Inc., 2001) considering sire breed and year nested within sire breed as fixed effects and slaughter age as linear regression.

**Results and conclusions** – Several studies have been reported to characterize growth and carcass traits of young bulls belonging to the European beef and dual purpose breeds (Albertí et al., 2008; Piedrafita et al., 2003), as well as for crossbreeds sired by beef breeds (Keane and Allen, 1998; Steen, 1995). Sire breed statistically significantly affected slaughter weight, hot carcass weight, net daily gain, dressing percentage and index of conformation in this study (Table 1).

| Genotype       | BRxCHA (n=20) | BRxLIM (n=70) | Sire breed | Year (Sire breed) | Slaughter age |
|----------------|---------------|---------------|------------|-------------------|---------------|
| Slaughter weight (kg) | 615 ± 9.8     | 592 ± 5.2     | 0.044      | 0.001             | 0.002         |
| Daily gain 1 (g/day)   | 1032 ± 21.0   | 995 ± 11.3    | ns         | 0.001             | <0.001        |
| Daily gain 2 (g/day)   | 1101 ± 23.4   | 1113 ± 12.6   | ns         | <0.001            | <0.001        |
| Hot carcass weight (kg) | 359 ± 6.7     | 339 ± 3.6     | 0.012      | 0.002             | 0.001         |
| Net daily gain (g/day)  | 671 ± 12.3    | 632 ± 6.6     | 0.007      | 0.002             | <0.001        |
| Dressing percentage (%) | 58.33 ± 0.46  | 57.26 ± 0.25  | 0.045      | ns                | 0.006         |
| Index of conformation  | 61.27 ± 1.01  | 58.90 ± 0.54  | 0.043      | 0.002             | ns            |
| Conformation score (1 – 15) | 8.97 ± 0.43  | 8.85 ± 0.23   | ns         | 0.018             | ns            |
| Fatness score (1 – 15)  | 7.81 ± 0.24   | 7.84 ± 0.13   | ns         | ns                | ns            |
| Carcass length (cm)    | 136.8 ± 0.99  | 135.3 ± 0.53  | ns         | 0.021             | 0.011         |
| Chest depth (cm)       | 42.8 ± 0.43   | 42.6 ± 0.23   | ns         | ns                | 0.001         |

\( n= \text{number of animals, BRxCHA}= \text{Brown x Charolais, BR x LIM}= \text{Brown x Limousin, Daily gain 1= daily gain on the test station, Daily gain 2= daily gain from 200 days age to slaughter, ns= not significant.} \)

Daily gain on the test station was better of Charolais sired bulls (1032.36g/day) compared to Limousine sired bulls (994.71g/day). On the other hand, BRxLIM bulls had better daily gain from 200 days age to slaughter for 11.82g compared to BRxCHA young bulls.
Very similar daily gains in fattening period in BRxCHA (1193g/day) and BRxLIM (1128g/day) were reported by Ferčej and Osterc (1980) at the same test station. Lower daily gain (951g/day) and dressing percentage (55.56%) found Sagsoz et al. (2005) in Brown Swiss x Charolais bulls. Better dressing percentage (61.3%) found Kögel et al. (1989) in young bulls of German Brown dams sired by Limousin. Year nested within sire breed was statistically significant for all variables except for dressing percentage, fatness score and chest depth. We have to consider that this effect included also the effect of sire, because each sire did not have progeny each year included in the study. Slaughter age was statistically significant for all variables except for index of conformation and conformation and fatness score. In this trial Charolais sired young bulls had some growth and carcass characteristic better than Limousine sired bulls of Brown dams. BRxCHA young bulls had larger estimated slaughter weight than BRxLIM bulls for 22.95kg as well as larger estimated hot carcass weight for 19.72kg, considered the correction on slaughter age. Those differences are also seen in better dressing percentage of Charolais sired bulls. Both, Charolais and Limousin sired bulls had similar carcass length and chest dept, but index of conformation was better on BRxCHA, because of larger hot carcass weight. However, Charolais sired bulls had “thicker” carcasses. We should consider the almost equal fatness scores of BRxCHA and BRxLIM crossbreds, which means that all variables were estimated at the same level of fatness.

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