ABSTRACT

Thirteen improved Jezersko-Solčava lambs (JSR) and 16 crossbreds with Charollais (JSRxCH) were used to evaluate the effect of genotype and sex on carcass traits. Lambs were weaned at around 60 days of age. They were fed with commercial concentrate and hay ad libitum and slaughtered at 30 kg of average live weight at 103 days of age. Crossbred lambs had at the same live weight at slaughter better conformation (9.19 on 15 points scale) than JSR lambs (7.58). Carcasses of crossbred lambs had lower proportion of fat in hind leg and lower proportion of kidney fat. Female lambs had better dressing proportion (46.25%) than male lambs (42.72%). Females had also higher scores for both internal and subcutaneous fatness and higher percentage of kidney fat. They had higher proportion of fat and lower proportion of bone in hind leg.

Key words: Lambs, Genotype, Sex, Carcass traits

Introduction

The present trend in Slovenia is to slaughter lambs at 30 kg of live weight (around 100 days of age). Breeders are using traditional husbandry system. They wean lambs at around 50 to 60 days and then fatten them on cereals or commercial concentrate till they reach 30 kg. The prevalent breeds in Slovenia are autochthonous Jezersko-Solčava breed (JS) and Jezersko-Solčava breed improved with Romanov breed (JSR). JSR breed is known as a very fertile breed (Cividini et al., 2002), but on the other hand its carcass quality is not so well known. A great number of factors affect ovine carcass and meat quality (Sanudo et al., 1998, Alfonso et al., 2001). Carcass quality is also effected by the breeder and his choice of animal genotype (Hopkins et al., 1997, Hawkins et al., 1985), and breeding technology (Santos-Silva et al., 2002, Diaz et al., 2002). One of the fastest ways to improve carcass quality represents crossbreeding, mostly industrial crossbreeding. Therefore industrial crossbreeding with Texel and in 2004 with Charollais breed was introduced in Slovenia. The aim of the following research was to compare carcass traits of improved Jezersko-Solčava lambs and their crossbreds with Charollais breed and to evaluate the effect of sex on these traits.

Material and methods

In the experiment 29 lambs of two genotypes were included: 13 improved Jezersko-Solčava lambs (JSR), 6 males and 7 females, and 16 crossbred lambs between improved Jezersko-Solčava
breed and Charollais (JSRxCH), 8 males and 8 females. Lambs of both genotypes and sexes were taken from two breeders (2x2x2 factorial design), reared on the farm where they were born, until slaughter. Lambs were reared with their dams on the pasture up to the age around 60 days (about 20 kg live weight), at which they were weaned. From 10 days on ward, the lambs were fed with commercial concentrate (18% crude proteins, 8% crude fibrins) and hay ad libitum until slaughter.

After slaughter, hot carcass weight (HCW) was determined. Kidney with knob channel fat belongs to the carcass. Carcass conformation and fatness classes were subjectively scored according to EUROP classification, with three subclasses in each class (points from 1 to 15).

Carcasses were kept at room temperature for 2 h, and where then chilled at 4°C for 24 hours. After chilling cold carcass weight was measured and further separated into main joints. Right leg was further dissected into muscle, subcutaneous fat and bone. Data were analyzed using the GLM procedure of SAS (1990). Fixed effects of genotype, sex and breeder were included in the model.

Results and conclusions

Mean slaughter weight of JSR lambs was 29.79 kg (108 days old) and the mean weight of crossbred lambs was 30.19 kg (100 days old).

Mean values for all carcass traits are shown in Table 1. Jezersko-Solčava lambs and their crossbreds with Charollais had similar growth rate and were slaughtered at around 30 kg live weight. Contrary to our expectation there were no significant differences in dressing proportion between JSR lambs and their crossbreds with Charollais.

Santos Silva et al. (2002), Carson et al. (1999), Hawkins et al. (1985) and Cividini (2004) reported that crossbreds with terminal meat breeds used in their experiment reached better dressing proportion. Crossbred lambs had higher values for carcass conformation at the same degree of fatness. Male lambs grew faster and had higher daily gain from birth until slaughter. Females had also better dressing proportion and so higher hot carcass weight. Female lambs were fatter than male lambs as indicated by external and internal fat estimation. Higher carcass fatness in females was also found by Vergara & Gallego (1999).

The proportion of fat in hind leg and the proportion of kidney fat differed between crossbred lambs and purebred JSR lambs (Table 2). Lower proportion of fat in hind leg and kidney fat was attained in crossbred lambs. The composition of hind leg showed that females had higher (p<0.001)
fat proportion and lower (p<0.01) bone proportion. Females had also more kidney fat. Similar results were found also by Hawkins et al. (1985).

On the basis of attained results, we can conclude that industrial crossing of JSR ewes with Charollais rams improved carcass quality of lambs slaughtered at 30 kg of live weight. Crossbred lambs had better carcass conformation and lower proportion of fat in hind leg. At the same live weight female lambs exhibited higher dressing proportion and higher fatness.

This work was supported by the Ministry of agriculture, forestry and food and Ministry of science and technology of the Republic of Slovenia.

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Table 2. Proportion of kidney fat, proportion of hind leg and its tissue composition of improved Jezersko-Solčava lambs and their crossbreds with Charollais (LSMeans ±SEE).

| Carcass traits          | Genotype (G) | Sex (S) | Level of significance |
|-------------------------|--------------|---------|-----------------------|
|                         | JSR (n = 13) | JSRxCH (n = 16) | Male (n = 14) | Female (n = 15) | G | S |
| HCW kg                  | 13.40 ± 0.26 | 13.28 ± 0.23 | 12.92 ± 0.25 | 13.75 ± 0.24 | ns * |
| Kidney fat %            | 1.74 ± 0.10  | 1.27 ± 0.09  | 1.22 ± 0.10  | 1.79 ± 0.10  | ** *** |
| Hind leg                | 30.38 ± 0.48 | 31.04 ± 0.43 | 31.00 ± 0.47 | 30.43 ± 0.45 | ns ns |
| Hind leg composition    |              |           |             |             |   |
| muscle                  | 70.88 ± 0.48 | 71.80 ± 0.43 | 71.83 ± 0.46 | 70.86 ± 0.45 | ns ns |
| fat                     | 10.63 ± 0.36 | 9.61 ± 0.32  | 8.95 ± 0.34  | 11.30 ± 0.33 | * *** |
| bone                    | 18.50 ± 0.34 | 18.58 ± 0.31 | 19.22 ± 0.33 | 17.84 ± 0.32 | ns ** |

HCW: cold carcass weight *P<0.05; **P<0.01; ***P<0.001; ns: not significant