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Short communication

Effect of pre- and post-pubertal castration on Piemontese male calves: I. Live and slaughtering performances

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Abstract

To evaluate the effect of different age of castration on live and slaughtering performances in Piemontese males a study was carried out on 24 cattle divided in 3 groups: EC—early castrated (5th month of age), LC—late castrated (13th month) and IM—intact males, reared under the same environmental condition until the same fattening degree, then slaughtered at 18 month of age. The animals were fed at the same energy and protein level. Live weight was recorded monthly and 18 linear body measurements were recorded at 18th month of age. Live performances and slaughtering data were recorded or calculated. Differences were found in live weight (higher in IM than EC and LC; $P<0.01$), buttock girth, chest girth (both higher in IM than EC; $P<0.05$) and shin girth (higher in IM and LC than EC; $P<0.05$). The average daily weight gain was higher in IM compared to EC and LC ($P<0.01$). The carcass weight was higher in IM than EC and LC ($P<0.01$). Little differences were found between EC, LC and IM in some anatomical parts weights. No differences were pointed out in the dressing percentage. Castration of Piemontese bulls at 13th month of age do not improve live and slaughtering performances compared to animals castrated at 5 month of age, even if the LC linear body measurements are more similar to the IM than EC.

Keywords: Piemontese breed; Steers; Bulls; Early and late castration; Linear measures

1. Introduction

In the developed countries, calves castration represents an old and traditional practice to obtain animal work force (draft animals), but now it is still used for steers' meat production. In Italy this practice allowed to obtain high quality meat used for cooking local typical and traditional dishes, but for technical (lowest feed conversion rate; Worrell et al., 1987), economic (longest rearing period; Lazzaroni et al., 2002) and social reasons (consumers have reduced beef meat consumption preferring leaner meat; Biagini and Lazzaroni, 1999) in the last half of the 20th century it was left. The recent renewal of Piemontese steers rearing in the breed's native diffusion area, for quality meat production (Biagini et al., 2001), showed new interest for this production by farmers, butchers and consumers (Biagini and Lazzaroni, 1999), but the traditional practice to castrate the calves before the

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puberty is now put beside by post-puberty sexual neutralisation, even if is to consider that after puberty castration is accompanied by increased stress and discomfort compared with castration prior to puberty (Keane, 1999). So it is possible that post-pubertal castration, influencing animal welfare and stopping masculine hormonal production, affect more the growth rate of late castrated than early castrated cattle, modifying the feed conversion rate and the daily weight gain. This is true especially comparing steers and bulls and imply a longer rearing period and an increase of production costs (feeds, labour, economical passive interests, etc.), but the interest for steers production in a specific value-based market is offered by the increase in farmer income for the plus in price achievable by steers that exceed the higher production costs.

Few and old data are available on such a production in Piemontese breed, so a trial was planned to evaluate the effect of castration on growth, live and slaughtering performance in males castrated at different age.

2. Methods

The study was carried out on 24 Piemontese calves of the same age and weight (157±19 days and 162±19 kg), homogeneously divided in 3 groups, according to age and weight: early castrated (EC—5th month of age), late castrated (LC—13th month of age) and intact males (IM—control group).

The sexual neutralisation, carried out by a veterinarian according to the welfare regulations, has been obtained after local anaesthesia by Burdizzo's pincer, pressing the scrotum and determining the spermatic and blood vessels cord interruption. This is the most diffuse technique among the local farmers because has a little influence on steer's growth capacity and behaviour (Fisher et al., 1996; Biagini et al., 2001). The late castration, over 12th month of age, is admitted by animal welfare and organic production system EU regulations if done to obtain traditional products, as the Piemontese steer.

The animals were reared in three pens (one for each experimental group) under the same environmental condition for an average of 405±9 days and the groups were fed for a theoretical daily gain of 1.2 kg with hay (2 kg/day, 0.55 UFV/kg and 60 g/kg PDI) and increasing amount of concentrate (0.95 UFV/kg, 113 and 100 g/kg PDI for growing and finishing periods respectively) to meet the increasing energy and protein requirements, according to the INRA scheme for young bulls of late maturing beef breeds (Jarrige, 1988) and the group consumptions of hay and concentrate were monthly recorded.

The animals were slaughtered at the same age (about 18 months) and fattening degree, visually evaluated by expert butchers according to the market requirements, during a period of 3 weeks.

During the trial live weight was recorded monthly and 18 linear body measures (height at withers, at hips and at pins; chest depth and height of free forelimb; head length; body, chest and rump length; chest width; rump width at hips, at thurls, at pins and maximum rump width; hindlimb thickness; buttock, chest and shin girth)

Table 1
Live and feeding performance in early castrated (EC), late castrated (LC) and intact (IM) Piemontese male cattle (mean±standard deviation)

	EC	LC	IM
Initial age (days)	156.3±16.95	158.1±21.06	158.0±19.91
Final age (days)	561.8±17.30	563.6±20.11	563.5±20.30
Trial length (days)	405.5±8.37	405.5±8.37	405.5±8.37
Weight gain (kg)	363.00±52.54B	371.75±40.84B	433.13±34.14A
DWG 5th–18th month (kg/day)	0.89±0.12B	0.92±0.12B	1.07±0.09A
Concentrate consumption (kg/day)	5.27±1.43	5.50±1.48	5.49±1.58
Hay consumption (kg/day)	1.84±0.03	1.84±0.03	1.84±0.03
Energy consumption (UFV/day)	6.19±1.44	6.42±1.49	6.41±1.58
Protein consumption (PDI g/day)	667±127	691±132	690±141
FCR 5th–13th month (kg/kg l.w.)	6.41±1.36	5.77±1.56	5.69±1.57
FCR 13th–18th month (kg/kg l.w.)	10.27±2.08	15.75±11.32	8.55±1.50
FCR 5th–18th month (kg/kg l.w.)	8.21±2.60	10.43±9.09	7.03±2.09

A, B: $P<0.01$.