THE EFFECTS OF CASTRATION ON CARCASS QUALITY OF GRAZING HEREFORD CATTLE.

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BACKGROUND AND OBJECTIVES

The castration is a common procedure in our production systems. However, there are no national studies on the effects of castration and the at castration on carcass quality. The use of entire males has the objective of improving growth rate as well as conversion efficiency, loweri percentage and the increase in yield of the retail product (Seideman *et al.*, 1982). The purpose of this experiment was to evaluate the effec the age at castration on the carcass quality.

METHODS

Thirty Hereford calves were randomly assigned by calving date and age of dam to the following treatments: entire males, castrated at birth castrated at 6 months. The cattle were managed under intensive conditions based on cultivated pastures under a grazing pressure equivalent kg DM/ 100 kg LW and supplemented at 1% LW with a concentrate (PC 19%, energy 2.8 Mcal ME/kg DM). During winter the grazing pres was increased to 2.5 kg DM/100 kg LW, supplemented with a grain concentrate at the same rate. The animals were slaughtered at a liveweigth of 360 kg and their fat depth measured 24 h post slaughter at the P8 point (Johnson *et al.*, 1981). The carcass measurements made according De Boer *et al.* (1974), while carcass classification was assessed using de National Meat Institute, system (INAC, 1997). tissue composition of the carcass was estimated by the dissection of the 10th rib (Geay et Béranger, 1969). At a commercial abattoir hindquarter-wholesale cut was separated into saleable meat, excess fat and bone.

Statistical analysis. Data were analyzed using an analysis of variance model (GLM procedure). Differences between means were compare the LSD t- test. Carcass classification data were analyzed by the Chi-squared test procedure.

RESULTS AND DISCUSSION

Carcass characteristics

Calves castrated at birth showed the highest percentage of dressing carcass (56,5%), entire males the lowest (54,9%), while steers castrated months of age reached intermediate values(table 1). These results are agree with those of Harte (1969), who found that castrated males significantly higher carcass dressing, with variation between 0.1 and 2.1 pu (percentage units). Prescott and Lamming, (1964) and Landon *e* (1978) working with pure-bred and crossbred Herefords reported superior dressing carcasses for the castrated (0,3 to 1,4 pu) than the e males. The variation in dressing percentages followed a similar trend to the carcass fat level. No significant differences were found in ca measurements between treatments. These results ar concordance with those from Purchas *et al.* (1993) Watson (1969), who found no differences between entire castrated animals, but a trend for larger carcasses for the l Branang (1971) pointed out that for animals the same age long-bones of entire males were heavier and shorter than of castrated ones. Treatments showed important differenc carcass fatness. Entire males yielded 70% of carcasses w grade 1, while those of castrated livestock showed a hi degree of fatness. Purchas (1997) and Seideman *et al.* (1 working with different classification systems, reported entire male carcasses showed a lesser grade of fatness rel to those of castrated calves. The fat depth at the P8 poin higher for castrated livestock. Similar findings have reported by Rowan *et al.* (1994) who found values of 9.4 for entire males and 13.4 mm for the castrated ones.

Table 1 . Carcass characteristics.

	Entires	Castrated at Birth	6 months	P > F
Dressing (%)	54.9 a	56.5 b	55.4 ab	0.04
Carcass length (cm)	116.4	115.9	117.7	NS
Leg length (cm)	71.4	71.8	71.5	NS
Leg perimeter (cm)	99.9	99.7	99.7	NS
Leg depth (cm)	35.6	35.9	36.5	NS
Leg width (cm)	22.1	22.0	22.2	NS
Chest depth (cm)	56.9	57.0	58.4	NS
Compact index (kg/cm)	1.7	1.7	1.6	NS
P 8 (mm)	10.5 a	16.1 b	14.6 b	0.0005
*Fatness grade 1 (%)	70	0	0	$P>\chi^2$
*Fatness grade 2 (%)	30	100	100	0.003

*Fatness grade = score 0 - 4

Carcass composition

Bull carcasses were characterised by a greater proportion of muscle (65,1%), a lower proportion of subcutaneous fat (4,3%), intermuscular fat (9,5%) and a higher bone proportion (21,1%) in relation to castrated males (table 2). Similar findings have been reported by Bailey *et al.*(1966) and Mc Donald and Kay (1967),who found that entire males had a superiority of 3,8 to 8,5 pu in muscle and 1,6 to 2,9 pu in bone, while the castrated animals showed a greater proportion of fat (6,7 to 9,3 pu). Prescott and Lamming

Table 2. Tissue composition at the 10th rib.

		Entires	Castrated at Birth	6 months	P > F
Muscle	(%)	65.1 a	56.4 b	57.4 b	0.005
Bone	(%)	21.1 a	18.7 b	19.6 b	0.06
Subcutaneous fat	(%)	4.3 a	9.0 b	7.8 b	0.0005
Intermuscular fat	(%)	9.5 a	15.9 b	14.8 b	0.0015
Muscle/Bone ratio		3.1	3.0	3.0	NS
Muscle/Fat ratio		5.3 a	2.3 b	2.7 b	0.004

(1964), comparing both types of cattle reported a greater proportion of muscle (64,2% vs 51,8%), a lower proportion of fat (16.8% vs 29,2%); but the same proportion of bone (19,1% vs 19%) for entire and castrated animals, respectively. In the present study the muscle : fat ratio was higher for bulls than steers (5.3 vs 2.54). The muscle : bone ratio was also higher for entire males, however, not significative. Harte *et al.* (1969) assessing the same type of ratio, suggested that entire males had a higher range values for the muscle : bone ratio (0,1 - 0,7) as well as for the muscle : fat ratio (3,5 to 5,6).

Hindquarter wholesale cut

Entire males had a higher proportion of saleable meat (68.1%), lower fat trimming (4.9%), and similar bone proportion compared to castrated animals (table 3). Field (1971) and Champagne *et al.* (1969), comparing boneless cut composition between entire and castrated males found a superiority of 2,6 pu (the former) and 4,5 pu (the latter) in the proportion of saleable meat for entire males. These results are in accordance to those reported by Harte (1969) and Scott (1964), who found no differences in the proportion of valuable cuts between bulls and castrated males.

Table 3. Pistol cut composition[1].

(%)	Entires	Castrated at Birth	Castrated at 6 months	P>F
Meat	68.1 a	65.5 b	65.8 b	0.016
Bone	21.6	21.7	22.1	NS
Fat	4.9 a	7.9 b	7.8 b	0.0001
Valuable cuts*	21.1	21.0	21.2	NS

[1] Hind quarter three rib cut, without flat. * Rump, tender loin and strip loin. Means corrected by carcass weight as covariant..

CONCLUSIONS

The age at castration had no effects on carcass traits, with the exception of carcass yield. Castrated males showed higher carcass yield, with greater fatness levels and an increase in fat depth at the P8 point. Entire males had a large proportion of muscle, higher muscle:fat ratio, higher proportion of saleable meat but no difference in high-value retail cuts.

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