CARCASS COMPOSITION OF MEDITERRANEAN (MEDITERRÂNEO) *BUBALUS BUBALIS* AND ZEBU (NELORE) *BOS INDICUS* BREEDS

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SUMMARY

A study of carcass and meat yields of Mediterranean of *Bubalus bubalis* compared to zebu (Nelore) of *Bos indicus* breeds was undertaken as part of an overall research program to evaluate the potential exploitation of buffaloes as a meat animal. Two groups of 6 bullocks of "Mediterrâneo" and 6 of "Nelore" were evaluated, all taken from semi-intensive management and finished 4 months in feed-lot. The animals were slaughtered between 17 to 20 months of age. Techniques for slaughtering, carcass dressing and cutting procedures followed the brazilian style and the butchering was that used in wholesale and retail markets. The buffaloes were significantly heavier (P 0,05) in mean liveweight with 478.3kg and in mean cold side carcass 122.5kg than the bovines with 363.8 and 103.0kg, respectively. The average yield were 52.0% for buffaloes and 56.8% for bovines. Average deboned cuts of buffaloes cold side carcass weighed 92.1kg corresponding to 75.2%, whereas from bovines the deboned cuts weighed 75.3kg corresponding to 73.1% of the cold side carcass weight. However, the yields of total commercial cuts in relation to liveweight were lower with 38.43 and 41.42% for buffaloes and cattle beef, respectively, and the difference between these yields were significant. These results, indicated that "Mediterrâneo" might be more precocious than "Nelore" regarding meat yield.

INTRODUCTION

In recent years the brazilian buffaloes population, estimated in 1984 as 804 thousands heads is increasing at a rate of 13.6% while beef cattle, the main source of meat, is increasing at 1.7% annually. In spite of this expansion, particularly in the less developed North and Northeast parts of the country, that hold 60% of the herd, buffaloes have still drawn little technical and scientific attention than other meat animals. Several studies from different countries demontrated the good productive traits of buffaloes even in unimproved feed condition and indicated their potentiality for meat production (Afifi *et al.* 1977; Charles *et al.*, 1970; Drudi *et al.*, 1976; Felício *et al.*, 1979; Joksimovic & Ognjanovic, 1977; Valim *et al.*, 1984, and Villares *et al.*, 1981)

In fact, the utilization of buffaloes meat already occurs in Brazil, but only at fresh meat consumption level at butcheries and retail markets without specie identification. The present study aimed to compare the carcasses and meat yield characteristics of bullocks of both major representative breeds of brazilian buffaloes and beef cattle herds.

MATERIALS AND METHODS

Animals

Six bullocks of "Mediterrâneo" and 6 of "Nelore" breeds, age ranging between 17 to 20 months, were taken from the herd of Andradina Experimental Station of Instituto de Zootecnia. The animals were reared in semi-intensive condition in improved pastures and finished in feed-lot over 4 months.

Slaughtering

The animals received water but no feed just before being transported to the abattoir and the weights were taken before they were loaded in trucks. The animals were rested for 24 hours at the abattois restrainer and slaughtered according to the Brazilian Federal Rules.

Body and carcass components

Jointing procedures of both side carcasses and deboning were as described by Norman & Felício, 1982. The cutting up of right cold side carcasses to the end point was according to the brazilian style.

Data handling

Variance analysis (according to Maxwell, 1978) of body and carcass components data were carried out adjusting to live, hot or cold carcass weigths, depending on the comparison being made.

RESULTS AND DISCUSSION

The quality of an animal source of meat is related to the carcass and meat yield, besides the slaughter offals. The carcass and meat quality are functions of genetic, sex, management and animal maturity characteristics. The body component values obtained from lots of buffaloes and bovines are described in Table 1.

The lot of buffaloes was heavier averaging 478,3kg in liveweight and 245.0kg in hot carcass weight, while values for beef cattle were respectively 363.8 and 206.8kg. However buffaloes carcass yield were lower averaging 52.0% while for beef cattle averaged 56.8%. Buffaloes liveweight were nearer the 460kg considered ideal by abattoirs for large animals. Compartively, the mean buffalo carcass yield obtained in the study was slightly higher than the 48.7% related by Felício et al., 1979 for 2 years old entire males buffaloes lot of Jafarabadi breed; and closer to the values reported by Drudi et al., 1976 of 50.4% for a group of 25 months entire males and 52.0% for a group of castrated 28 months Murrah breed.

It was expected that the thicker layer of fat covering on the buffaloes carcasses could act as a barrier to moisture evaporation. However the lower evaporative chilling losses observed for buffaloes (Table 1) were not significantly lower thanthose for the beef cattle.

The relatively large carcass yield difference between species observed can be accounted to the significantly heavier carcass weight, head plus horns, heart, abdominal fat and digestive tract and fills in the buffaloes group (Table 2).

Table 3 shows the data of commercial bone-in primary and deboned commercial secondary cuts. It can be noted that mean percentage of flank and plate and of forequarters (5 ribs), adjusted to buffaloes and bovines cold side carcasses, was significantly higher for buffaloes. Hindquarters of both species averaged

similar values. The trimmings plus losses were not significantly different between "Mediterrâneo" and "Nelore", but bone weight related to cold side carcass weight was lower in the buffaloes group.

Secondary cuts from special hindquarter differed significantly in rump, striploin plus rib eye roll, tenderloin, inside round, eye round and bone (Table 3). From forequarter (5 ribs) the bovine has an extra muscle, the hump, genetic characteristic of the specie. Mean corrected deboned percentage weight of flank and plate was significantly higher for buffaloes. At the present, the commercially most important cuts for the meat plants or for the butcheries are from special hindquarter followed by those of the forequarter. The flank and plate sold on the bone, also constitutes the main source of raw-material for "charque" (salt fermented) production.

At the retail local market the highest price cut is the tenderloin, followed by rump, striploin plus eye roll; eye round; inside round; outside round and knuckle; rib cap, chuck roll and shoulder; brisket, hindshank plus heel and foreshank; and bone-in flank and plate; which reach respectively 78.6; 73.2; 69.6; 57.1; 50.0 and 42.9% of the tenderloin price.

The Tale 4 shows the data regarding the yield of commercial secondary cuts of both species, calculated from the weights obtained from cold side carcasses.

Although buffaloes hadshown higly significant heavier liveweight (Table 1), total commercial cuts, bones and non-carcass components than bovines, the corrected percentages to liveweight of the individual carcass components vary as shown in Table 3. The proportion of commercial meat cuts and bones in buffaloes group with values of 38.43 and 9.67% were significantly lower than for bovines with values of 41.42 and 11.21%, respectively.

CONCLUSION

The results of this trial indicated that "Mediterrâneo" buffalo breed might be more precocious than the "Nelore" cattle breed regarding meat yield. However further studies are necessary to assess the economical meaning of this finding.

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Table 1. Body components of buffalo and bovine.

Component Loss	"Mediterrâneo" Kg Mean	"Mediterrâneo" Kg SD	"Mediterrâneo" %	"Nelore" Kg Mean	"Nelore" Kg SD	"Nelore" %	Difference at 95% level
Liveweight	478.3	47.8	100.0	363.8	45.2	100.0	s(1)
Hot carcass	249.3	29.4	52.0	206.8	27.5	56.8	s(1)
Cold carcass	247.8	29.8	51.7	204.7	26.9	56.3	s(1)
Chilling loss	1.6	1.1	0.8	2.2	0.8	1.1	ns(2)

(1) Mean values corrected for difference in liveweight.

(2) Mean values corrected for difference in cold side carcass.

s: statistically significant

ns: statistically not significant

Table 2. Non-carcass components of buffalo and bovine.

Component	"Mediterrâneo Kg Mean	SD	%	"Nelore" Kg Mean	SD	%	Difference at 95% level (1)
Head + horns	17.59	2.40	3.64	9.68	0.53	2.68	s
Tongue	0.93	0.10	0.19	0.85	0.30	0.23	ns
Tail	1.20	0.08	0.25	0.99	0.11	0.27	ns
Feet	11.78	1.29	2.47	8.58	0.83	2.37	ns
Hide	62.3	5.3	13.1	40.9	5.5	11.3	s
Viscera							
Liver	4.99	0.41	1.05	3.77	0.43	1.04	ns
Kidney	0.92	0.17	0.19	0.73	0.16	0.20	ns
Heart	1.85	0.24	0.39	1.18	0.12	0.33	s
Lung	2.58	0.31	0.54	2.19	0.29	0.61	ns
Spleen	1.14	0.17	0.25	0.87	0.10	0.24	ns
Fat							
Kidney fat	4.79	0.94	1.00	2.28	0.30	0.64	s
Pelvic fat	0.54	0.13	0.12	0.25	0.05	0.07	s
Other organs and digestive tract and fills (2)	118.39	11.23	24.81	84.71	12.14	23.24	s

(1) Mean values corrected for difference in liveweight.
(2) Calculated by difference.

s: statistically significant.
ns: statistically not significant.
SD: standard deviation.

Tabela 3. Commercial cuts of buffalo and bovine cold side carcasses according to brazilian secondary cutting end point.

Commercial cuts	"Mediterrâneo"			"Nelore"			Difference at 95% level
● Primary cuts Secondary cuts	Kg		%	Kg		SD %	
	Mean	SD		Mean	SD		
● Special hind-quarter	58.3	7.1	47.1	48.7	7.0	47.5	s
Rump + tail of rump	6.58	0.94	5.3	4.64	0.86	4.52	s
Striploin + rib eye roll	8.80	1.23	7.09	6.67	0.83	6.53	s
Tenderloin	2.18	0.34	1.75	1.63	0.24	1.60	s
Knuckle	5.18	0.69	4.18	4.00	0.70	3.89	ns
Inside round	7.52	0.97	6.08	7.19	0.71	7.05	s
Outside round	5.91	0.76	4.78	4.30	0.50	4.23	ns
Eye round	2.48	0.46	1.99	2.03	0.30	1.99	s
Rib cap	0.76	0.17	0.61	0.94	0.35	0.90	s
Hind shank + heel of round	4.22	0.81	3.38	3.18	0.53	3.10	ns
● Forequarter (5 ribs)	47.3	6.0	38.2	42.9	4.6	42.1	s
Shoulder	10.60	1.17	8.57	8.53	1.10	8.34	ns
Neck	4.41	0.95	3.54	3.48	0.51	3.41	ns
Chuck roll	8.85	1.65	7.10	7.85	1.11	7.70	ns
Brisket	6.94	0.66	5.64	5.65	0.95	5.56	ns
Humo	-	-	-	2.91	0.55	2.84	s
Foreshank	3.31	0.63	2.67	2.74	0.44	2.69	ns
● Flank and plate	18.0	2.8	14.6	12.3	2.00	12.0	s
Deboned flank and plate	14.40	2.24	11.60	9.47	1.49	9.23	s

Mean values corrected for difference in cold side carcass
s: statistically significant
ns: statistically not significant
SD: standard deviation

Table 4. Yield of commercial cuts of buffalo and beef cattle.

Component	"Mediterrâneo" Kg Mean	"Mediterrâneo" Kg SD	"Mediterrâneo" %	"Nelore" Kg Mean	"Nelore" Kg SD	"Nelore" %	Difference at 95% level (1)
• Carcass							
Total commercial cuts (2)	184.28	23.78	38.43	150.56	18.08	41.42	s
Total trimmings + losses (2)	17.10	4.50	3.59	16.72	5.24	3.78	ns
Total bones (2)	46.38	5.80	9.67	40.66	4.00	11.21	s
• Non-carcass components (3)	230.6	17.8	48.3	155.9	18.0	43.6	s

(1) Mean values carrected for difference in liveweight.
(2) Total commercial side cuts multiplied by 2.
(3) Calculated by difference.
s: statistically significant.
ns: statistically not significant.
SD: standard deviation.