

## CARCASS CHARACTERISTICS AND COMMERCIAL MEAT CUTS WEIGHTS FROM NELLORE STEERS FED YERBA MATE

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**Abstract** – This study aimed to evaluate carcass characteristics and meat cut weights from cattle fed diets supplemented with different levels of yerba mate (0%, 0.5%, 1%, and 1.5% w/w). Forty-eight Nellore steers with an average age of 21 months and an initial weight of 419 kg were individually fed during 94 days with the same base diet, differing only by yerba mate content. The animals were slaughtered and after 24 hours of chilling, carcass characteristics (hot carcass weight, carcass yield, rib eye area and backfat thickness) were evaluated and cuts from the forequarter (blade and shin, hump, chuck and neck, brisket) and sawcut (strip loin, tenderloin, rump cover, topside, flat, eye round, knuckle and shank) were weighed. The beef was separated from the bones and the excess fat was trimmed, as the Brazilian commercial system. The addition of yerba mate to the cattle diet did not affect any variable analyzed.

**Key Words** – antioxidants, forequarter, *Ilex paraguariensis* St. Hilaire, sawcut, spare ribs

### I. INTRODUCTION

Antioxidants retard or inhibit oxidation of other substances by inhibiting the initiation or propagation of oxidizing chain reactions [1]. Synthetic and natural antioxidants have been used to retard or minimize food oxidative deterioration. Natural antioxidants are substances with different chemical characteristics, which are widely present in plants. Consequently, natural antioxidants can protect the biologically important cellular components from oxidative processes caused by reactive oxygen species [2]. In meat industry, quantitative and qualitative carcass characteristics have a fundamental importance because they are directly related to the final product. Carcass yield is directly related to meat production, expressed as a percentage of hot carcass weight relative to live weight. Carcass is usually divided into primary cuts to

be commercialized (forequarter, sawcut and spare ribs (Figure 1).

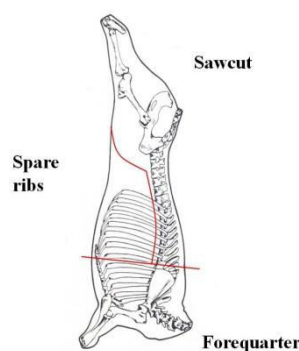


Fig. 1 - Subdivision of the half carcass in primal cuts: forequarter, sawcut and spare ribs.

These cuts weights have a great importance to the meat industry, because carcasses with excessive fat will be more trimmed, generating greater economic losses [3]. It is economically desirable a higher yield of hindquarter cuts toward others, because of their higher commercial value. However, regardless breeds, animal tends to keep within certain limits a balance between the forequarter and hindquarter [4]. The aim of this study was to evaluate the effect of yerba mate supplementation in the diet of Nellore cattle finished on feedlot and evaluate carcass characteristics and weights of different meat cuts from these animals.

### II. MATERIALS AND METHODS

Forty-eight Nellore steers were randomly assigned in individual pens and fed the same diet. The diets (Table 1) were differentiated only by the presence of different levels of yerba mate extract (0%, 0.5%, 1% and 1.5% w/w). Animals were fed twice a day, during 94

days. Then they were submitted to food and water fasting for 16 hours before slaughter, which was held in a commercial abattoir.

Table 1 - Composition of rations (% dry matter)

Ingredients	Treatments			
	1	2	3	4
Yerba mate extract	0	0.5	1	1.5
Kaolin	1.5	1	0.5	0
Corn silage	43	43	43	43
Ground corn grain	51.3	51.3	51.3	51.3
Soybean meal	1	1	1	1
Urea	1	1	1	1
Limestone	1	1	1	1
Mineral supplement	1.2	1.2	1.2	1.2
Monensin	0.03	0.03	0.03	0.03
Nutrients (%)				
Crude protein	11	11	11	11
TDN	72	72	72	72

TDN=total digestible nutrients

After slaughter, hot carcasses were weighed for further evaluation of carcass yield. Then, carcasses were chilled overnight at 2°C and rib eye area and backfat thickness were measured. Weights from the forequarter cuts (blade and shin, hump, chuck and neck, brisket) and from the sawcut (strip loin, tenderloin, rump cover, topside, flat, eye round, knuckle and shank) were obtained according to the routine adopted at the commercial abattoir. The experimental design was completely randomized with four treatments and twelve replications, with analysis of variance and regression depending on the levels of yerba mate added to the animal diet. For statistical analysis, XLSTAT [5] software was employed.

### III. RESULTS AND DISCUSSION

The different levels of yerba mate extract did not affect ( $P>0.05$ ) any carcass characteristics (Table 2).

The results obtained for HCW and CY are similar to those obtained by [6] who reported 278.2 kg HCW and 57.76% CY for Nellore steers finished in feedlot. Values obtained for HCW are also similar to those obtained by [7], who presented results obtained from feedlot Nellore and slaughtered with similar final live weight. The mean values for CY (56.18%) are in the range of variation considered adequate (53-59%) to Nellore cattle [8].

Table 2 - Carcass characteristics, according to different levels of yerba mate extract

	Treatments				P value	SE
	0%	0.5%	1%	1.5%		
HCW (kg)	291.6	288.9	292.0	283.0	0.804	10.248
CY (%)	55.82	56.11	56.24	56.57	0.624	0.571
REA (cm <sup>2</sup> )	56.29	55.73	56.25	56.81	0.825	1.142
BFT (mm)	10.83	13.33	9.00	10.25	0.155	1.902

HCW=hot carcass weight; CY=carcass yield; REA=rib eye area; BFT= backfat thickness; SE = standard error.

The mean values obtained for REA (56.27 cm<sup>2</sup>), are similar to those 58.56 cm<sup>2</sup> observed by [8]. All values obtained for REA are close to those found in Nellore steers finished in feedlot [6, 9]. External fat protects carcasses from dehydration during chilling. The minimum external backfat thickness required by the Brazilian beef industry, to avoid penalty in carcass pricing, is 3 mm [10]. All animals showed more than 3 mm back fat thickness. According to the values presented in Table 3, the addition of yerba mate extract did not affect ( $P > 0.05$ ) any forequarter meat cuts.

Table 3 - Forequarter meat cuts weights (kg), according to different levels of yerba mate extract.

Cuts	Treatments				P value	SE
	0%	0.5%	1%	1.5%		
Blade and shin	16.4	16.6	17.0	16.6	0.734	0.591
Hump	4.6	5.0	4.4	4.4	0.353	0.422
Chuck and neck	17.1	16.9	16.6	16.4	0.818	0.749
Brisket	7.8	7.6	8.0	7.5	0.501	0.357

SE=standard error

The values from all forequarter meat cuts weights are slightly lower than those presented by [11], however it can be explained by the fact that the animals from this study were a few months older than those used by the authors [11]. The mean values presented for blade and shin (16.7 kg), chuck and neck (16.8 kg) and brisket (7.7 kg) are similar to those obtained (13.98, 14.42 and 8.36 kg, respectively) by [12] for Nellore finished in feedlot. In general, the values for all variables are homogeneous between treatments and are similar to those obtained for Nellore finished in feedlot [6, 11].

The addition of yerba mate extract also did not affect ( $P>0.05$ ) sawcuts weights, as shown in Table 4.

Table 4 - Sawcuts meat weights (kg), according to different levels of yerba mate extract

Cuts	Treatments				P value	SE
	0%	0.5%	1%	1.5%		
Strip loin	8.5	8.3	8.3	7.9	0.317	0.356
Tenderloin	1.9	1.9	2.0	1.9	0.649	0.078
Rump cover	1.2	1.1	1.2	1.1	0.174	0.034
Topside	10.1	10.1	10.5	10.0	0.525	0.382
Flat	5.4	5.5	5.6	5.4	0.822	0.251
Eye round	2.7	2.7	2.7	2.6	0.952	0.134
Knuckle	5.5	5.4	5.7	5.5	0.392	0.202
Shank	4.3	4.3	4.4	4.3	0.955	0.166

SE=standard error

Weights obtained for strip loin, tenderloin, rump cover, outsideflat and eye round are similar to those obtained by [6]. Weights presented for topside, knuckle and shank are close to those observed by [11]. Mean weights obtained for striploin (8.29 kg) and topside (10.20 kg) are similar to 9.10 kg and 8.76 kg respectively, obtained by [12]. It demonstrates that meat cuts weights obtained are similar to those reported for Nellore steers finished in feedlots.

These results are part of a project whose goal was fed Nellore steers yerba mate extract supplemented diets and evaluate possible changes at the meat oxidative stability. Based on meat cuts weights presented we can say that the use of yerba mate extract on the animals diets can improve meat quality, without reducing the market value of the animal.

#### IV. CONCLUSION

The addition of yerba mate extract to animal diet did not affect carcass characteristics neither commercial meat cuts weights. The similarity between meat cuts weights from the different levels of yerba mate shows that it is possible to produce homogeneous meat cuts from animals fed diets with yerba mate extract, without affecting carcass characteristics.

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