



Abstract #W26

Residual feed intake in progeny of Nellore (*Bos indicus*) bulls

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INTRODUCTION AND OBJECTIVE

Residual feed intake (RFI), defined as the difference between observed intake and that predicted from average weight and daily gain, has been proposed as a criterion for genetic selection. Beef production enterprises may benefit from breeding cattle for RFI by reducing feeding costs without compromising growth rate and maternal productivity traits. However, most investigations have been carried out using *Bos taurus* breeds (Angus and Hereford) which are known to produce fatter carcasses than Zebu cattle. There has been very little work with this trait in *Bos indicus* breeds. The objective of this study was to assess the genetic variability in RFI in Nellore cattle and to determine the relationship between RFI and carcass and performance characteristics.

MATERIALS AND METHODS

The study was conducted at Guaporé Pecuária S/A, Pontes e Lacerda, MT, Brazil. At the start of the trial 75 castrated steers, progeny of eight bulls (minimum five progeny/bull), with approximately 22 months of age and 394 kg of SBW, were fed individually for 85 days. The diet consisted of 25% sorghum silage and 75% concentrate on a dry matter basis, and was supplied *ad libitum*. The composition was: 13.22% CP, 9.35% rumen degradable protein and 84.68% TDN, on DM basis. Dry matter intake (DMI) was measured daily and cattle were weighed every 35 days. RFI was calculated regressing DMI against the metabolic mid-test BW and ADG as follows $DMI = 0.0766 \times \text{Average BW}^{0.75} + 1.94 \times \text{ADG}$ (RSD = 0.725). High and Low RFI classes were defined as those animals with RFI ≥ 0.5 standard deviations above or below the mean (0), respectively. All the steers were killed and *Longissimus* muscle area and fat thickness were recorded at the 12th-13th ribs, and carcasses were split into bone, trimmings and retail product yield. Data were submitted to analysis of variance for a completely randomized design using the GLM procedure (Minitab Inc., College Park, PA) and effects were considered significant when $P \leq 0.05$ and a tendency when $0.05 < P \leq 0.10$.

RESULTS

Individual values of RFI ranged from -1.306 to 2.169 kg/d. Mean RFI for the low and high RFI groups were -0.875 and 0.756 kg/d, respectively; by definition, weights and ADG were similar between RFI groups. There was no difference among RFI groups for hip height and carcass traits. However, intakes and feed:gain were greater ($P < 0.05$) in high as compared to low RFI steers. There was no difference among progeny groups for height, initial and final weights, RFI, carcass weight or marbling score. Progeny groups differed ($P < 0.01$) in dressing percentage (range 53.6 to 55.8%), backfat (range 4.1 to 6.3 mm), 24-hour pH (range 5.57 to 5.84) and shear force (range 3.92 to 6.42). There were tendencies ($P < 0.10$) for differences among progeny groups for DMI, ADG, gain:feed, and *Longissimus* muscle area. None of the carcass traits were clearly related to RFI.

Table 1. Performance data by RFI group.

Variable	RFI			SD	P
	High	Medium	Low		
RFI, kg/day					
n	25	28	22		
mean	0.756	-0.01	-0.875	0.25	< 0.01
DMI, kg/day	10.37	9.58	8.63	0.75	< 0.01
ADG, kg/day	1.153	1.205	1.215	0.04	0.69
Feed:Gain, kg/kg	0.0987	0.1068	0.1124	0.01	< 0.05

Table 2. Performance data by progeny group.

	Initial weight	Final weight	DMI	ADG	G:F	RFI
Bull	kg	kg	Kg/d	Kg/d	Kg/kg	Kg/day
1	393.1	482.0	9.00	1.164	0.1290	-0.5477
2	374.1	476.8	9.27	1.315	0.1418	-0.3400
3	412.1	494.5	9.32	1.050	0.1126	0.0377
4	387.5	470.5	9.52	1.087	0.1141	0.1365
5	381.8	482.2	9.38	1.290	0.1375	-0.2429
6	392.1	492.7	9.95	1.287	0.1293	0.1841
7	386.6	476.3	9.57	1.133	0.1183	0.1528
8	413.1	514.6	10.14	1.292	0.1274	0.2165
SD	28.66	36.62	0.37	0.250	0.0220	0.71
P	0.05	0.09	0.10	0.09	0.10	0.07

Table 3- Carcass data by progeny group.

Bull	Carcass weight	Dressing %	Ribeye area	Backfat	Marbling	Shear force
	kg	%	mm ²	mm		kg
1	262.8	54.39	73.11	6.33	220	4.35
2	255.2	53.56	72.33	3.83	190	4.50
3	270.1	54.76	66.40	6.00	150	4.00
4	260.8	55.29	70.00	4.09	154	5.39
5	258.6	53.61	64.80	5.40	186	6.37
6	274.7	55.75	74.30	4.50	148	5.52
7	261.5	54.87	68.40	5.00	203	4.30
8	280.5	54.61	70.14	5.79	174	4.60
SD	37.0	0.01	5.90	1.72	58	1.33
P	0.11	0.005	0.06	0.03	0.13	0.02

CONCLUSIONS

These results show substantial genetic variability in RFI and other traits among progeny of Nellore bulls, comparable to previous results with *Bos taurus* breeds. Most efficient Nellore steers produced carcasses of similar quality as those obtained by least efficient cattle.

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