MUSCLE AND FAT DEPOSITION AND RETAIL CUTS YIELD OF NELORE YOUNG BULLS WITH DIVERGENT EXPECTED PROGENY DIFFERENCE FOR GROWTH

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I. INTRODUCTION

The need for improvement of animal production and profitability has generated great search for technologies that provide better results for producers and industry. In this sense, the use of genetic selection for growth rate has been largely used. Some authors related that the use of expected progeny differences for growth (EPDg) can improve de average daily gain, slaughter weight, and profitability [1, 2]. However, the difference of growth patterns among animals can lead to changes on muscle and fat deposition, as consequence, subprimal cuts yield. There are few studies reporting the effects of selection for growth in those traits. Therefore, the aim of this study was to evaluate the effects of different EPD for post-weaning growth (EPDg) on muscle and fat deposition as well as on retail cuts of *Bos indicus (*Nellore) young bulls finished on feedlot

II. MATERIALS AND METHODS

One hundred forty seven Nellore contemporary young bulls (19 months old, 412 ± 53,8 kg of live weight) were selected based on their information of EPDg (weight gain from 7 to 18 months old) divided into two groups: 1) Seventy-three bulls high EPDg represented by the mean of 11.50 kg, and 2) Seventy-four bulls low EPDg represented by the average of -1.0 kg. Animals were finished in a feedlot for 90 days. At the beginning of the feedlot and every 28 days all animals were weighed and ultrasound scanned for determinations of the L*ongissimus* muscle area (LMA) and backfat thickness (BFT) between 12th and 13th ribs, and the rump fat thickness (RFT) on the B*iceps femoris* between the Ilium and Ischium. Ultrasound scanning's were performed using an Aloka® model SSD 500 Micrus (Aloka Co.Ltd., Zug, Switzerland) with a linear probe (3.5 mHz, 172 mm in length). At the end of feeding period animals were slaughtered and after 24h of chilling carcasses were completely deboned to determine the weight of individual retail cuts. Data was analyzed as a completely randomized design, using the MIXED procedure of SAS (SAS Institute Inc.NC, USA), including the fixed effects of EPDg days on feed and its interaction.

III. RESULTS AND DISCUSSION

No significant interaction was observed between EPDg vs days on feed for any trait. The LMA, BFT and RFT were not affected by EPDg class (Table 1). However, there was a significant effect for time on feed, where all traits increased linearly with time on feed (P<0.001). This results can be explained by similar performance between groups observed during the feedlot. The initial and final weight characteristics, as well as the better daily gain performance during the finish phase, are due to the genetic improvement process applied in the population selected for post weaning weight [4]. The most of retail cuts were not affected by EPDg class, except for brisket (*P* = 0.01) and hind muscle (*P* = 0.07) that were heavier in animals of high than those of lower EPD's group (Table 2).

Table 1 Effect of EPD for growth on muscle mass and adipose tissue deposition, measured by ultrasound.

Trait	EPD		Period (days)				SEM	P-value		
	High	Low	0	28	56	90		EPD	Period	EPD*Period
Loin eye area, cm²	66.7	67.2	58.2	64.5	69.7	75.3	1.22	0.565	<.0001	0.999
Subcutaneous fat thickness, mm	2.4	2.4	0.2	1.8	3.1	4.4	0.21	0.816	<.0001	0.255
Rump fat thickness, mm	5.4	5.2	2.6	4.7	6.2	7.6	0.28	0.300	<.0001	0.588

It is important to remember that animals were selected by post-weaning growth (body gain from weaning up to 345 days) and at this time, the performance was completely different between groups (427.3 vs 412 kg/initial BW for high and low EPDg, respectively). However, when they were finished in feedlot (587.5 vs 569.1 kg/final BW for high and low EPDg, respectively) no differences in growth was found, as consequence, no changes on muscle mass, fat and most of retail cuts were observed. Clarke et al., [2] working with EPD for some economic traits in cattle of different breeds, reported that the EPD for weaning weight and performance post weaning may not represent differences for carcass and subprimal yields.

Table 2 Effect of EPD for growth on subprimal yield (kg).

Trait	EPD		SEM	P-value
	High	Low		
Hindquarter subprimals, kg				
Striploin	9.1	9.1	0.15	0.860
Tenderloin	1.9	1.9	0.04	0.572
Top sirloin cap	1.6	1.5	0.24	0.117
Eye of rump tail of round	6.7	6.6	0.61	0.447
Knuckle	5.9	6.0	0.09	0.610
Eye of round	2.9	3.0	0.06	0.236
Inside round	6.9	6.8	0.37	0.499
Outside round	11.0	10.8	0.16	0.174
Tail of round				
Forequarter subprimals, kg				
Chuck	19.2	18.7	0.47	0.346
Shoulder	15.6	15.1	0.61	0.153
Brisket	5.6	5.2	0.11	0.012

IV. CONCLUSION

Bulls with different EPD for growth does not differ in muscle mass, fat deposition and retail cuts yield. These results suggest that the improvement of carcass traits should be based on carcass measurements instead of growth traits only.

ACKNOWLEDGEMENTS

The authors are grateful for the financial support by grant #2013/07985-2 from the Foundation for Research Support of the State of Sao Paulo (FAPESP).

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