IN UTERO EXPOSURE TO EARLY OR CONVENTIONAL WEANING AND DAM PARITY INFLUENCE ON CARCASS CHARACTERISTICS OF NELLORE BULLS

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I.INTRODUCTION

In tropical beef cattle production, late pregnancy is a period of increased nutritional requirements for maintenance, gestation, and lactation, which coincides with the year's dry season. Moreover, for young cows, these requirements are further intensified by the necessity to support their own growth [1]. Thus, implementing an early weaning strategy emerges as a possible approach to alleviate the nutritional requirements of the dams, particularly for young cows (primiparous or secundiparous), thereby directing more nutrients toward fetal growth.

Previous research reported that lactation during gestation decreases the embryonic and post-natal growth of the offspring in taurine cows [2,3,4]. However, there are currently no reports on the effect of early weaning or parity of zebu cows on the carcass characteristics of the next offspring.

The objective of this study was to evaluate the effect of weaning either early (150 days) or conventionally (240 days) in multiparous or secundiparous cows, on the carcass characteristics of bulls that were *in utero* at the time of weaning. We hypothesized that bulls born from dams weaned early in the previous lactation, particularly from secundiparous dams, would exhibit improved carcass characteristics.

II. MATERIALS AND METHODS

This experiment was conducted at the College of Animal Science and Food Engineering (FZEA) of the University of São Paulo (USP), under the approval of the Institutional Animal Care and Use Committee (# 2884250620).

Experimental units, including primiparous and multiparous Nellore cows, were assigned to one of two weaning strategies where suckling calves were either early weaned 150 days (EW) or conventional weaned at 240 days (CW). All cows were managed similarly after weaning, and through parturition, and weaning of subsequent calves, with resulting calves managed together until use in the current experiment. Fifty-six Nellore bulls with an initial body weight of 417.4±47.63 kg and 18 months of age were allocated to feedlot in three collective pens equipped with Intergado® electronic feeders (Betim, MG, Brasil) and fed a total mixed ration (80:20 concentrate:corn silage) for an average of 97 days. The experimental design used a block (pens, n=3) incomplete randomized 2x2 factorial arrangement, considering fixed effects of dam weaning strategy (EW or CW), and dam parity at subsequent calving (multiparous or secundiparous – MC and SC, respectively).

Bulls were selected for slaughter within each block and with at least 3 mm of subcutaneous fat thickness measured by ultrasound (SFTu). The slaughter was conducted following the humane slaughter practices outlined in the Regulations for Sanitary Inspection and Industrialization of Animal Origin Products [5]. Hot carcass weight was recorded and the dressing percentage was calculated. After 24 of chill were determined the ribeye area (REA) and subcutaneous fat thickness (SFT), in the *Longissimus thoracis* muscle at the 12th rib level.

Data were analyzed using PROC MIXED of SAS 9.4, considering the fixed effects weaning strategy, dam parity and its interaction as fixed effects. Significance was considered when *P* values were less than 0.05 and a trend when 0.05 < *P* ≤ 0.10.

III. RESULTS AND DISCUSSION

No significant interaction was observed for most traits, except for SFT, that tended to show a weaning strategy × dam parity interaction (*P*=0.091). No effect of weaning strategy was found for body weight, carcass weight or dressing percentage (Table 1), however, ribeye area tended to be greater in CW group (*P*=0.083), compared to EW. Meanwhile, bulls born from MC cows had greater shrunk body weight (*P*=0.030) and hot carcass weight (*P*=0.035) than bulls from SC cows. The subcutaneous fat thickness was smaller in the SC-CW group (*P*<0.05), while other treatments did not differ. The lower SFT for SC-CW cows plus the better results for carcass characteristics of the bulls born to MC cows may be related to a developmental programming effect whereby the SC cows had greater nutritional demands due to continued growth compared with MC cows, resulting in MC cows having greater availability of nutrients for fetal growth [1].

Table 1 – Carcass characteristics of Nellore bulls from secondiparous or multiparous dams that were in utero at the time when dams were exposed to early or conventional weaning strategies.

	Weaning strategy			Cows parity			P – Value[2]		
Item[1]	Early	Conventional	SEM[2]	Multiparouss	Secundiparous	SEM[2]	W	P	W×P
Nº. Cattle	27	29	—	29	27	—	—	—	—
Age at slaughter, months	22	22	0.18	22	22	0.18	0.320	0.420	0.660
SBW, kg	573.87	570.45	8.86	585.02	559.29	8.29	0.748	0.030	0.358
HCW, kg	324.90	324.24	5.48	332.12	317.02	5.01	0.918	0.035	0.625
HCY, %	56.62	56.81	0.24	56.73	56.69	0.23	0.597	0.921	0.212
REA, mm²	77.93	81.50	1.54	79.99	79.44	1.43	0.083	0.803	0.765

[1]SBW: Shrunk body weight; HCW: Hot carcass weight; HCY: Hot carcass yield; REA: Rib eye area; SFT: Subcutaneous fat thickness.
[2]SEM: Standard error of the mean; W: Weaning effect; P: Cow parity effect; W×P: Interaction between weaning and cow category.

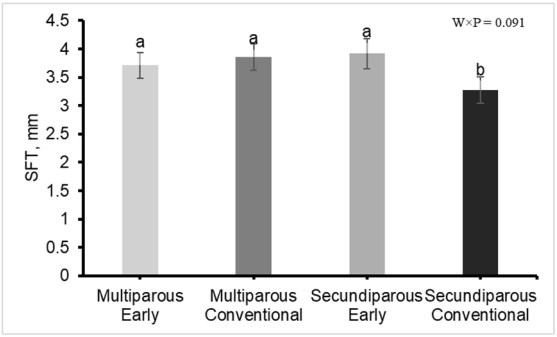

Figure 1. Interaction for subcutaneous fat thickness of Nellore bulls from secondiparous or multiparous dams that were in utero at the time when dams were exposed to early or conventional weaning strategies.

IV. CONCLUSION

In utero exposure to early weaning due to the interruption of milk production tended to improve the deposition of subcutaneous fat in bulls born from secundiparous cows. Bulls born from multiparous cows had greater carcass weight compared to those born from secundiparous cows. These results suggest the necessity that most studies use different ages and strategies for weaning in young cows (primiparous and secundiparos).

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