

NUTRITION OF HEREFORD COWS FROM ~100 DAYS OF GESTATION TO NEAR TERM INFLUENCES BODY AND CARCASS CHARACTERISTICS OF PIEDMONTESE AND WAGYU SIREDB NEWBORN CALVES

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The objective of this study was to investigate body and carcass composition of newborn calves with high potential for muscle growth (Piedmontese × Hereford) and marbling (Wagyu × Hereford) following divergent prenatal nutrition, as part of studies aimed at elucidating the cellular basis and regulation of growth and development of carcass tissues.

Female calves (n = 16) with birth weights representative of those born to Hereford cows nourished on poor (Low) or high (High) quality pasture from ~100d pregnancy to near parturition and sired by Piedmontese (PxH calves) or Wagyu (WxH calves) bulls were selected for slaughter within 24 h of birth. Organs and selected muscles and body tissues were dissected out and weighed, empty body weights (EBW) determined, and standard carcasses prepared and weighed.

Overall, the PxH calves had a higher dressing percentage (carcass,%EBW) than the WxH calves, and tended to have less organ mass on an EBW specific-basis. There was a significant influence of nutrition on the proportion of hide in the body, and GxN interactions for dressing percentage and hide and abdominal fat percentages were evident.

Table 1. Characteristics of newborn female calves born to Hereford cows (n=16) nourished on poor (Low) or high (High) quality pasture from ~100 d of pregnancy to parturition and sired by Piedmontese (PxH calves) or Wagyu (WxH calves) bulls. Values in parentheses are SD.

Item	PxH Low (n=4)	PxH High (n=4)	WxH Low (n=4)	WxH High (n=4)	Significant Effects ¹
EBW ² , kg	26.7 (4.1)	39.0 (6.2)	25.7 (3.6)	30.7 (1.1)	n.a. ⁵
Carcass, kg	15.6 (2.8)	24.0 (4.4)	15.0 (2.4)	17.1 (0.7)	n.a.
Carcass,% EBW	58.0 (2.7)	61.4 (1.4)	58.3 (1.2)	55.8 (1.3)	G,GxN
Organs,%EBW	9.9 (0.5)	9.2 (0.1)	10.0 (0.6)	10.2 (1.0)	G*
Hide, %EBW	9.5 (0.7)	10.2 (0.4)	9.0 (0.1)	10.9 (0.4)	N,GxN
Semitendinosus, %EBW	0.41 (0.01)	0.40 (0.06)	0.37 (0.06)	0.36 (0.01)	-
Semitendinosus, %CW ³	0.71 (0.03)	0.65 (0.11)	0.64 (0.10)	0.65 (0.01)	-
L dorsi (lumbar), %EBW	0.32 (0.10)	0.38 (0.03)	0.32 (0.03)	0.34 (0.09)	-
L dorsi (lumbar), %CW	0.55 (0.15)	0.62 (0.06)	0.55 (0.06)	0.60 (0.15)	-
Abdominal fat ⁴ , %EBW	0.51 (0.14)	0.44 (0.13)	0.44 (0.13)	0.64 (0.04)	GxN

¹ Effects (P < 0.05, *P < 0.10) on relative weights (%CW or %EBW) of carcass or tissues as determined by ANOVA including GxN: G = genotype, N = pregnant cow nutrition; ² Empty body weight; ³ Carcass weight; ⁴ Abdominal plus kidney fat; ⁵n.a. = not applicable

This study confirms previous findings (Greenwood *et al.* 2001) that PxH newborn calves have a greater proportion of carcass tissues at birth than WxH newborn calves. However, differences in pregnant cow nutritional regimens and/or newborn body weights appear to have affected distribution of body components between the genotypic groups compared to the previous study. In particular, differences in relative weights of muscles between genotypes were less evident in the present study.

GREENWOOD, P.L., HEARNshaw, H., HENNESSY, D.W., THOMPSON, J.M. and HARPER, G.S. (2001). *Proc. Assoc. Advmt. Anim. Breed. Genet.* **14**, 473-6.

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