THE EFFECTS OF LOW OR HIGH QUALITY PASTURES ON THE LIVE WEIGHT OF COWS AT CALVING AND ON THE BIRTH WEIGHT OF CALVES SIRED BY WAGYU OR PIEDMONTESE

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This paper outlines the effects of a low and a high plane of nutrition during gestation on cow live weight at calving and on calf birth weight, as well as the interactive effect of calf genotype on cow and calf birth weights. The objective was especially to reduce foetal growth below that expected in adequately nourished cows. This study is part of an experiment aimed at understanding of the effects of nutrient supply on growth rates of progeny at specific phases of their life and the subsequent effects on pattern of development of muscle, fat, and carcass.

From November 1999 to January 2000, 360 Hereford females were mated to selected lines of Wagyu or Piedmontese sires. Pregnant cows were allocated according to dam age and sire of foetus to 9 replications of 32 head. Four reps were allocated randomly to low and 5 to high quality pastures in early February. The low quality pastures consisted of grasses whose growth phase had been completed by February and which declined in quality until August when calving commenced. Cows then grazed other pastures slightly higher in yield and quality. Cows on the high plane of nutrition grazed on kikuyu/Rhodes grass pastures from February until mid May when they were given access to highly productive ryegrass pastures. For each 28 days, these cows spent 21 days on ryegrass and 7 on kikuyu/Rhodes grass until calving commenced in August. During the calving period (3 months), high cows were confined to ryegrass pastures. The mean live weights of the cows (C) and heifers (H) grazing the low (L) and high (H) quality pastures during the final 180 days *in utero* nutrition treatment period are indicated below, according to the calf genotype (W, Wagyu; P, Piedmontese; Figure 1A), and calf sex (F, female; S, steer; Figure 1B).

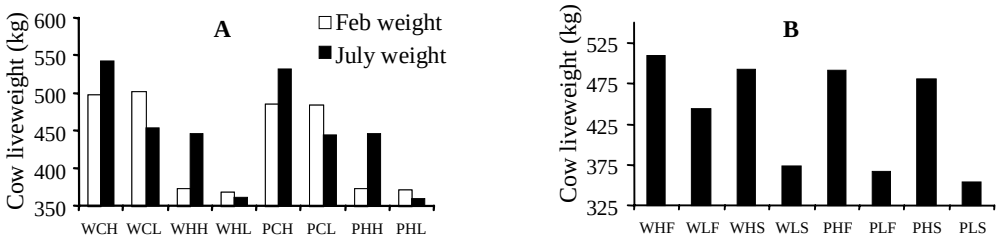

Figure 1 A. Cow and heifer live weight by calf genotype B. Cow live weight at calving according to calf sex

There were no interactions between the main terms for cow/heifer weight at calving, the high groups being heavier than the low (493 *v* 368 kg) and cows heavier than heifers. However, dams with a W- foetus were heavier than dams with a P-foetus (438 v 423 kg). There were significant main effects of nutrition (N), sire breed (B), parity (Py) and calf sex on calf liveweight at birth and the interactions NxPy and NxS were significant. Birth weights, according to NxPyxB, are presented in Table 1. Low nutrition *in utero* reduced the birth weight of calves ($P<0.05$), except for W- cross calves from cows.

Table 1 Calf birthweights (kg) 2001 according to dam nutrition, parity and sire breed (sed = 1.68)

High nutrition						Low nutrition					
Cow:	Wagyu	Pied	Heifer:	Wagyu	Pied	Cow:	Wagyu	Pied	Heifer:	Wagyu	Pied
	32.6	39.2		30.2	37.8		30.9	34.9		25.3	30.5

Imposing nutritional differences at grazing on cows and heifers reduced their liveweight at calving when the period was restricted to about the last 180 days of gestation. Steer foetuses reduced cow liveweight at calving, as did P-sired foetuses, especially of Low cows and heifers. The declining quality in Low pastures was particularly evident in cow liveweight in the last 60 days of the experimental period, necessitating removal of the cows. The objective in reducing cow liveweight at calving was to reduce growth and development of the foetus *in utero* and ultimately birth weight of the calf. This was achieved for all calves except for Wagyu cross calves from cows.

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