# GESTATION LENGTH IS INFLUENCED BY SIRE BREED, PARITY AND SEX OF CALVES, BUT NOT BY NUTRITION FROM ~100 DAYS OF GESTATION

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Lean meat yield and marbling are two important economic traits being evaluated in a study which aims at understanding influences of early-life nutrition and genotype on growth and development of muscle and fat cells. Calves for this study were bred from Piedmontese (P) and Wagyu (W) sires to obtain maximum numbers of live calves with extremes in birth weight. This paper reports effects of nutrition *in utero*, fetal sex, sire breed and cow parity on gestation length, and calving and birth traits.

Primiparous (Pp) and multiparous (Mp) Hereford cows were artificially inseminated (AI) then paddock mated to P and W sires. At ~100 d gestation, 300 pregnant cows (192 pregnant to AI) were placed on low (native subtropical) or high (improved temperate) quality pasture for the remainder of pregnancy. At calving, genotype, sex, birth weight, skeletal size and calving difficulty were recorded. Gestation lengths were determined for AI progeny only.

Gestation lengths for P-sired calves were 3.9 days longer than for W- sired calves; and 2.4 days longer for Mp cows than for Pp cows. However, gestation length was not affected by quality of pasture grazed by cows from about 100 days of pregnancy. An interaction between fetal sex and cow parity was also evident. In general, longer gestation length was associated with heavier birth weights, greater skeletal measurements, and increased calving difficulty and neonatal deaths (Table 1).

**Table 1. Gestation length, and associated calving and birth traits, as affected by sire breed, fetal sex, parity and dam nutrition from ~100 days of pregnancy (standard error of the mean in parentheses).**

| Effects | Gestation (days) | Difficulty (%) | Neonatal deaths (%) | Birth weight (kg) | Birth Length (mm) | Height (mm) |
|---|---|---|---|---|---|---|
| Wagyu-sired fetus | 281.9 (.6) | 13 | 8 | 29.8 (.4) | 664 (3.6) | 680 (3) |
| Piedmontese-sired fetus | 285.8 (.6) | 40 | 19 | 35.6 (.4) | 697 (3.4) | 710 (3) |
| Low cow nutrition | 283.2 (.7) | 25 | 12 | 30.4 (.5) | 664 (3.7) | 681 (3) |
| High cow nutrition | 284.5 (.6) | 27 | 15 | 35.0 (.4) | 697 (3.3) | 709 (3) |
| Male calves from primiparous | 283.9 (.9) | 48 | 16 | 32.2 (.6) | 679 (4.8) | 692 (4) |
| Female calves from primiparous | 281.3 (1) | 35 | 24 | 29.8 (.7) | 656 (5.5) | 677 (5) |
| Male calves from multiparous | 284.7 (.9) | 11 | 6 | 36.4 (.6) | 703 (4.8) | 714 (4) |
| Female calves from multiparous | 285.4 (.9) | 2 | 11 | 32.5 (.6) | 684 (5.2) | 694 (4) |
| Significant effects[1] | B, P, SxP | | | S, N, P, B, NxB, NxS | S, N, P, B, SxNxB | S, N, P, B, |

[1] Effects ($P < 0.05$): B = sire breed of fetus; P = parity; S = sex of fetus; N = *in utero* nutrition of fetus.

These results confirm our previous findings (Hearnshaw *et al.* 2001) that P-sired calves have longer gestation lengths than W-sired calves. The gestation length for W-crosses reported here and previously is shorter than the 287 days presented by Deland *et al*. (2001). Our results also demonstrate that gestation length is shorter in primiparous than in multiparous females, a result similar to Deland *et al*., (2001). An interaction between fetal sex and cow parity was also evident, with differences in gestation length for calf sex in Pp females being greater than for Mp females. In our previous study (Hearnshaw *et al.* 2001) sex of calf did not affect gestation length.

DELAND, M.P.B., ROSS, R.A., ABRAHAM, E.A. and PITCHFORD, W.S. (2001) *Proc. Assoc. Advmt. Anim. Breed. Genet.* **14**, 333-6.

HEARNSHAW, H., HENNESSY, D.W., GREENWOOD, P.L., HARPER, G.S. and MORRIS, S. (2001). *Proc. Assoc. Advmt. . Anim Breed. Genet.* **14**, 337-40.

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