

Nutritional effects on reproductive performance in primiparous weaned sows

M. Vinsky, S. Novak, M. Dyck, W. Dixon and G. Foxcroft

Swine Reproduction-Development Program, Dept. AFNS, University of Alberta, Edmonton, AB T6G 2P5; **Email:** george.foxcroft@ualberta.ca

Voluntary feed intake during lactation in primiparous sows is often insufficient to meet the needs for maintenance and milk production. The catabolic state of a proportion of these sows is known to reduce reproductive performance after weaning. To further understand the reasons for this reduction in fertility, primiparous sows were fed either 2.5 (Restrict:R) or 5.0 (Control:C) kg day⁻¹ of a standard lactation diet during the last week of a 21-day lactation, resulting in R sows being more catabolic at weaning (Table 1). Although ovulation rate ($P = 0.95$) and weaning-to-estrus interval ($P = 0.79$) were not different, embryonic survival (Table 1), crown-rump length ($P < 0.05$) and weight ($P < 0.01$) of embryos, at Day 30 of gestation were negatively impacted in R sows. Interestingly, the increased embryonic loss in R sows was almost entirely associated with loss of female embryos ($P < 0.01$), thus altering the proportion of males within the litter from 54% in C sows to 61% in R sows.

Table 1. Sow metabolic state at weaning and embryonic survival to Day 30.

Item	Control	Restrict	P value
Day 0 to 21 of lactation			
Protein loss % of parturition mass	-5.32 ± 0.89	-12.6 ± 0.89	<0.0001
Fat loss % of parturition mass	-7.79 ± 1.76	-17.3 ± 1.76	0.0008
Net energy balance (Mcal day ⁻¹)	-13.5 ± 0.6	-15 ± 0.6	<0.04
Embryo data			
Embryo survival rate (%)	79.19 ± 4.00	67.89 ± 3.88	0.02
Number of live embryos	14.39 ± 0.78	12.29 ± 0.76	0.03
Number of females	6.54 ± 0.57	4.71 ± 0.56	0.005

We are investigating the concept that these effects of catabolism are due to “genetic imprinting”, resulting in developmentally compromised embryos.

Implications:

The proper management of sow feed intake during lactation is essential to prevent reductions in both the size and quality of the subsequent litter.