253-21

DIETARY INTAKE DURING EARLY PREGNANCY DOES NOT INFLUENCE EMBRYONIC SURVIVAL AND VARIABILITY IN GILTS

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A high level of feeding during early pregnancy has been associated with a reduction in embryonic survival in some studies, which may result in reduced litter size in moderately prolific sows. In highly prolific sows, embryonic survival is generally not a limiting factor for litter size. Furthermore, high embryonic survival reported in hyperprolific sows results in uterine crowding and an increased risk of intrauterine growth retardation. Moreover, a good embryonic survival rate has been associated with greater variability in embryo development. In hyperprolific sows, thus, a reduced embryo survival in the preimplantation period could have beneficial effects on litter characteristics at birth through an early reduction in embryo heterogeneity and uterine crowding. Our objective was to determine if a high level of feeding during early pregnancy influences embryo survival and weight in prolific gilts.

Thirty Large White gilts were artificially inseminated twice at 227 ± 1days of age and 133 ± 2 kg live weight. During the 7 days after the first AI, they received 4 or 2 kg daily of a gestation diet (groups High and Control, respectively, n = 15/group). Before and after this period, all gilts received 2 kg of a gestation diet. Gilts were slaughtered at 27.0 ± 0.1 days of pregnancy. The genital tract was collected and living, dead and resorbed embryos were recorded. Embryos were considered dead when allantoic and amniotic fluids were dark and not limpid. Resorptions were characterized by the absence of both embryo and fluid. Each living embryo was weighed and measured. For each gilt, calculated criteria were embryo survival (number of living embryos at slaughter/number of corpora lutea); "post-implantation" embryo survival (number of living embryos at slaughter/total number of embryos); within-litter mean embryo weight and length, and coefficients of variation; and *in utero* density (number of living embryos per meter of uterine horn). Variance analyses were performed using dietary treatment, replicate and the interaction as main factors. Correlations between criteria were calculated. The level of significance was $P < 0.05$.

At slaughter, twenty-eight gilts were pregnant (15 and 13 in groups High and Control, respectively). Ovulation rate averaged 21.0 ± 0.5 and ranged from 14 to 27. None of the criteria was significantly influenced by the level of feeding during the first week of pregnancy. The number of living embryos averaged 17.5 ± 0.6 (10-25), embryo survival 85.4% (55-100%) and post-implantation embryo survival 96.7% (77-100%). Given the great number of ovulations for such young gilts, embryo survival was good, which is consistent with previous findings in highly prolific sows. Across treatments, embryonic survival was not correlated with ovulation rate or uterine length. Within-litter variability in embryo weight averaged 10%, with 6 to 18% extreme values. Embryo heterogeneity was not correlated with ovulation rate, number of total or living embryos or embryo density. Similar results were obtained for embryo length and its variation.

As a conclusion, for prolific gilts, a high level of feeding during early pregnancy did not reduce embryo survival and had no beneficial nor detrimental effects on embryo size and variability at 27 days of gestation.