

The Effect of Maternal Dietary Selenium on Immunoglobulin Concentrations in Biological Fluids of Sows and Their Offspring

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Abstract: Suckling pigs were used to assess the effects of low maternal dietary selenium (Se) on immunoglobulin (Ig) concentrations in biological fluids. Six weeks prior to breeding, mature gilts were randomly assigned to either Se adequate (0.39 ppm Se, n=3) or Se deficient (0.05 ppm Se, n=3) gestation diets. Gilts were pen exposed to a mature boar for 20 min daily to observe estrus behavior and mated at their second estrus period. At birth, pigs were fostered between treatment groups as described in Table 1. Lactation diets were formulated to contain either 0.53 ppm Se (adequate) or 0.06 ppm Se (deficient) and sows were fed these diets for the three-week lactation period. Baby pigs were not allowed access to creep feed. Blood samples of gilts were taken 1 wk prior to expected farrowing date and at the end of lactation (4 wk later) to establish maternal serum IgG and IgM levels. Colostrum was collected at parturition prior to the piglets being allowed to suckle and milk samples were collected at d 7, 14 and 21 for measurement of IgG and IgM. Baby pigs (n=4 from each treatment in Table 1) were bled at birth (d 1) and at d 7, 14 and 21 to evaluate serum Ig concentration. Maternal serum IgM was not affected by Se intake. Sows fed the Se deficient diets had a greater decrease in serum IgG from 1 wk prior to farrowing and 3 wks after farrowing compared to Se adequate ($p<0.01$). Milk IgG and IgM was not affected by treatment ($p>0.01$). Pigs born to, and suckled by, sows receiving the Se adequate diets had higher serum IgM at d 7, 14 and 21 compared to other treatment groups ($p<0.01$). Cross fostering pigs born to sows fed the Se deficient diets to sows fed the Se adequate diets did not restore piglet serum IgM levels compared to control ($p<0.01$). Piglet serum IgG decreased equally for all treatment groups over the three-week period ($p>0.01$). These results are in agreement with results from cattle and sheep that indicate maternal Se status during gestation affects Ig absorption in the offspring.

Table 1. Fostering scheme

Birth Status	Suckling Status	Number of Pigs
Low Se	Low Se	11
Low Se	Control	9
Control	Control	11
Control	Low Se	10