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CREEP FEEDING AND PHYTOHEMAGGLUTININ SKIN-TEST RESPONSES IN PIGS¹

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and Debbie M. VanWormer

Summary

An experiment was conducted to determine the influence of creep feeding on cellular immunity in young pigs. Creep feeding from 10 days of age to weaning did not influence phytohemagglutinin skin-test responses.

Introduction

There are two critical periods when young pigs show especially low resistance to microbial infections. One period is from the second to fourth week postpartum when maternally derived antibodies are decreasing and active antibody synthesis is low. The other critical time is at weaning when various stressors, such as, removal from the sow, regrouping with unfamiliar individuals, and diet and environmental changes may enhance the danger of infection. Unfortunately, these two critical periods often occur simultaneously during the first few weeks of the pig's life and thus may impose tremendous threats to the animal's disease defense mechanisms.

Our earlier studies have shown that weaning compromises cellular immune function in 2- to 3-wk-old pigs. However, regrouping unfamiliar pigs was not related to altered immune responses. One important, abrupt adaptation that the young pig must make is an adjustment to a new feed type and source. Reduced feed intake and short-term water deprivation have been associated with cellular immune alterations in laboratory animals. Therefore, our hypothesis was that creep-fed pigs may suffer less from the stress of weaning than noncreep-fed pigs, thereby, diminishing the resultant immunosuppression.

Procedures

Fifty-four Duroc x Yorkshire pigs (nine pigs from six litters) were used in the study. Ten days after farrowing, each litter was divided into three treatment groups of three pigs each. One group served as a control and remained with the sow. The other two groups were removed from the sow for two 1-hr periods a day; once in the morning and once in the evening. The pigs removed from the sow were placed in empty farrowing crates adjacent to the sow. One group removed from the sow was allowed free access to a commercial creep feed (No Sow/Creep); the other group removed from the sow did not receive creep feed (No Sow/No Creep). The treatments continued until weaning at 21 days of age. All pigs were weighed and cellular immune reactivity was evaluated by an in vivo phytohemagglutinin skin-test response at 10, 21 and 31 days of age.

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Results and Discussion

Pig weights and phytohemagglutinin skin-test responses are shown in table 1.

Table 1. Effect of Creep Feed on Pig Weights and Phytohemagglutinin (PHA) Skin-test Reactions^a

Item	Treatment			SE
	Control	No Sow/No Creep	No Sow/Creep	
Pig weight (lbs)				
10-day	7.19	7.16	7.26	.26
21-day	14.01	13.71	13.55	.49
31-day	17.09	16.36	16.72	.78
PHA response (Δ mm)				
10-day	7.57	7.62	7.52	.27
21-day	8.43	8.23	8.28	.30
31-day	6.74	6.88	6.67	.37

^aEach value is the mean of 18 pigs.

Creep feeding did not influence weight gain or phytohemagglutinin skin-test responses. To minimize the variability in cellular immune reactivity that is normally present between different litters of pigs, we felt that it was necessary to allot creep-feeding treatments within each litter. Other researchers have used a within litter test to evaluate growth performance in creep-fed pigs and have found it to be comparable to a between litter evaluation. Although we did not observe a beneficial effect of creep feeding on in vivo cellular immune responses, it is possible that sufficient creep-fed intake was not achieved to influence this response.