

SWINE HEALTH

Title: Effect of Sow Dietary Glutamine Intake on Subsequent Nursery Pig Growth After an Intestinal Disease Challenge **NPB #02-192**

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Date Received: November 17, 2003

Abstract: Sixteen sows were randomly assigned to two treatments: CON: Control corn-soybean meal diet; GLN: Corn-soybean meal diet + 2.5% crystalline glutamine. No differences ($P > 0.10$) between treatments were observed for sow weight loss, sow feed intake, or litter weight gain. Sow plasma glutamine concentration tended to be increased on d 7 and 21 ($P < 0.13$) in sows fed GLN. Milk glutamine concentration was increased ($P < 0.08$) on d 7 and 21 of lactation. However, suckling pig plasma glutamine concentration was not altered ($P > 0.38$) on d 21 by glutamine enriched milk consumption. On d 21, pigs were weaned to a common starter diet, sow treatment structure was maintained, and two additional treatments were imposed on weanling pigs and arranged in a 2 x 2 factorial: SAL: Saline injection on d 1 and 3; Lipopolysaccharide (LPS) $91 \mu\text{g} \cdot \text{lb BW}^{-1}$ injection on d 1 and 3. Lipopolysaccharide injection on d 1 and 3 reduced ($P < 0.05$) ADG during d 0 to 3, 3 to 7, and 7 to 14. Daily feed intake was reduced ($P < 0.005$) during d 0 to 3, 3 to 7, 7 to 14, and 14 to 21 by LPS injection. However, LPS increased ADG/ADFI during days 3 to 7 ($P < 0.0001$) and d 7 to 14 ($P < 0.02$). Progeny of sows fed CON diet gained 0.14 lb/d ($P < 0.03$) more weight during d 3 to 7, and consumed 0.33 lb/d more feed ($P < 0.09$) during d 7 to 14 versus progeny of GLN-fed sows. Small intestine length measured on d 3 was not affected ($P > 0.23$) by sow diet or injection type. Pigs injected with LPS had reduced ($P < 0.01$) small intestine empty weight. Progeny from sows that consumed CON had 10% greater empty weight on d 7 compared to progeny from sows fed GLN. Pigs injected with LPS had reduced ($P < 0.01$) small intestine weights on d 7 compared to pigs injected with SAL. Lipopolysaccharide challenge reduced ($P < 0.01$) duodenum villus height. However, progeny of sows that consumed GLN had 12% greater ($P < 0.05$) villus height on d 3 compared to progeny of sows fed CON. Duodenum villus height on d 7 was similar in progeny from sows fed GLN and injected with SAL; whereas, progeny from sows fed GLN injected with SAL had reduced villus height (Diet x LPS, $P < 0.05$). Collectively, these data suggest that dietary glutamine increases sow milk glutamine concentration, but does not positively influence progeny growth performance during lactation or immediately following weaning during an immune challenge.

These research results were submitted in fulfillment of checkoff funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer reviewed

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