Does the Inclusion of Lyso-Lecithin (Lecired) Improve the Growth of Newly Weaned Pigs?

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The inclusion of 10% (dietary fat) lyso-lecithin to high or low energy diets of weanling pigs had only modest effects on growth or feed conversion regardless of whether the diets contained 2, 4 or 6 % tallow.

Weaning is a stressful experience, one in which anewly weaned piglet is abruptly transferred from a liquid milk diet, containing about 8% fat to a dry diet with approximately 5% fat. In addition, fat digestibility of milk fat by the suckling pig approaches 95% while the digestion of dietary fat by the piglet shortly after weaning is only about 75%. Subsequently, supplementing dietary fat into diets of newly weaned piglets does not alleviate the deficit in energy intake experienced at this crucial time.

Previous studies have shown that the addition of lecithin to the diet of newly weaned piglets improved digestibility of long-chain fatty acids, however, it did not show an improved growth rate. Lecithin, which is primarily phosphatidylcholine, is commonly added to food, because it is an emulsifier. It is listed in CFIA, Schedule IV. One specific project at Prairie Swine Centre examined if Lyso-lecithin will improve digestibility of tallow, resulting in a performance response when the pigs are limiting in energy.

The experiment used 12 treatments, 10 pens of 4 pigs (weaned at 26 days of age, n = 480) per pen per treatment. Each room (considered a block) contained 24 pens (thus the experiment required 5 nursery rooms) with pigs being assigned to pen based on body weight.

Piglets received a commercial phase 1 diet for 7 days before switching to the phase 2 diet for the remaining 21 days. Diets were formulated to be a minimum of 5% different in NE content (approximately 120 calories) within 2 phases (average BW of weight group, 5 to 12 kg BW, and 12 to 25 kg BW). Except energy, all other nutrients met requirements for piglets of this age. In order

Table 1. Treatment designation.

Treatment #	1	2	3	4	5	6	7	8	9	10	11	12
Tallow, %	2	2	4	4	6	6	2	2	4	4	6	6
Lecithin	0	10%	0	10%	0	10%	0	10%	0	10%	0	10%
NE, kcal/kg	2400	2400	2400	2400	2400	2400	2280	2280	2280	2280	2280	2280
Actual lecithin inclusion, %												
Lyso lecithin	0	0.2	0	0.4	0	0.6	0	0.2 (0.4	0	0.4	0	0.6
(Lecired)		(0.4)		(0.8)		(1.2)				(0.8)		(1.2)

NOTE: Lecired is 48% lecithin.

to minimize variation among the diets, 4 batches (diets 1 to 6, 7 to 12, 13 to 18 and 19 to 24) were prepared. These were then divided into smaller batches and appropriate amounts of corn starch, cellulose and tallow added. Piglets and feeders were weighed on day 0, 3, 7, and weekly until day 42 (nursery exit). This allowed the determination of growth rate, feed intake and feed efficiency.

RESULTS AND DISCUSSIONS

Overall, there were minimal effects of treatment on performance of the piglets in this experiment. Because there were very few significant interactions of lecithin with either dietary tallow or energy, only the main effects of the lecithin are shown. Adding lecithin at 10% of dietary fat to the diet did improve growth and feed intake in the first 3 days of the experiment (Table 1. $P < 0.05$, d 7 to 10 post weaning).

However, despite a significant effect of the lecithin, there were no interactions with either dietary energy or tallow during this time period. We had hypothesized that lecithin would improve digestibility of the tallow, and effects would be more apparent in a low energy diet. However, as can be seen in Figure 1, the effect of lecithin was greater in the high energy diet ($P < 0.05$).

This experiment was designed to examine the effect of lecithin in the diet, because there is evidence that fat digestibility in the newly weaned pig is impaired because of a lack of lipase enzyme, and the observation that fat emulsification would improve fat digestibility and thus energy available to the piglet. For example, the addition of 0.02% lysolecithin improved growth performance and tended to improve fat digestibility when added to the diet of weanling pig (Jin et al. 1998). However, others (ie. Price et al. 1988) saw no effect of fat emulsification on the performance of newly weaned pigs. It was suggested that dietary energy was not limiting growth in these piglets. We included the energy treatment in our experiment to test this hypothesis.

> "Inclusion of lyso-lecithin (10% of dietary fat) into high or low energy diets fed to newly weaned pigs had no effect on growth or feed conversion."

Tallow was used as a fat source in our experiment because it has been shown that the digestibility of tallow a saturated fat) was improved more by the addition of dietary lysolecithin to the diet than when an unsaturated fat was used (Jin et al. 1988).

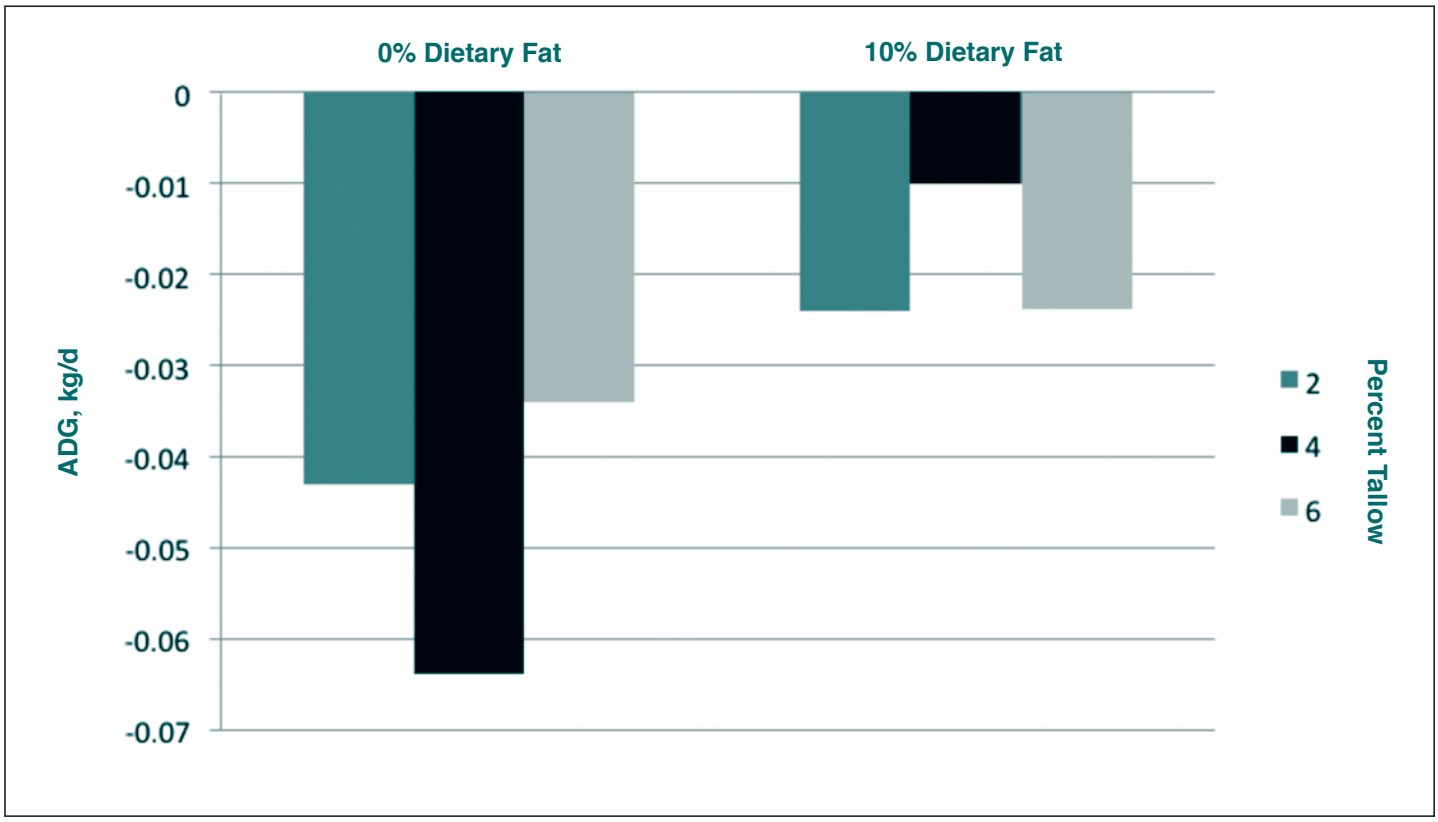

Figure 1. The interaction of lecithin (0 or 10 % of dietary fat) and tallow ($P < 0.05$) in the diet on the growth of weanling pigs, experimental d0 to 3 (d0 is d7 post- weaning)