

## **Evaluation of Dietary Energy Sources for Lactating Sows**

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### **General Objectives**

- To evaluate corn, barley, barley + added fat, and naked oat as energy sources for lactating sows when supplemented with soybean meal.
- To document sow and pig performance, pig survival, milk protein and energy composition, and sow re-breeding performance.

### **Brief Discussion**

Rotational cropping is rapidly being adopted in North Dakota for a number of agronomic reasons, but most importantly, to increase farm income. Naked oat, developed by NDSU plant breeders (McMullen, 1994) is a new, high quality small grain being grown in crop rotations, and has been evaluated in early-weaning pig starter diets at this Center by Landblom and Poland (1997). In that study, early weaned, 14.3 pound pigs, grew at a comparable rate when compared to pigs fed all corn based starter diets.

Based on the nutrient composition of naked oat and weanling pig response to naked oat as a grain base in the pig starter diets, we hypothesized that sows fed lactation diets formulated with either naked oat or barley + added fat (to approximate the energy content of the corn-based control diet) would perform as well as sows fed a conventional corn-based lactation diet.

To test our dietary energy source hypothesis, 189 sows were allotted at 109 days of gestation to four dietary energy sources at two locations (NDSU - Swine Unit, Fargo and NDSU Dickinson Research Extension Center - Swine Unit).

### **Status**

This project was completed just prior to this annual report's deadline. The project's outcome is summarized in the following abstract:

Crossbred sows (n=189) were allotted at 109 days of gestation to four dietary treatments. Dietary treatments were: (1) corn-soybean meal (SBM), (2) barley-SBM, (3) barley-SBM + fat (sunflower oil) added to approximate Metabolizable Energy (ME) in Diet 1, and (4) naked oat-SBM. Calculated ME concentrations for the four diets were, respectively; 3.23, 3.08, 3.23, and 3.33 Mcal/kg. All diets were formulated to .95% lysine. Litters were adjusted to 10 pigs/sow by day 2 post-farrowing. Sows were allowed ad libitum access to feed and water during lactation. Sow parity, no. of pigs on day 2, and lactation length averaged 3.4, 10.9, and 19.7 days, respectively. Average daily feed intake during lactation was 5.83, 5.67, 5.71, and 5.73 kg ( $P > .40$ ); thus, calculated ME intakes for the four diets were 18.8, 17.5, 18.4, and 19.1 Mcal/day. Litter weaning weight (58.1, 54.5, 57.6, and 58.3), litter weight gain (39.6, 36.0, 39.2, and 39.8 kg), and average pig weight (5.90, 5.53, 5.88, and 5.68 kg) were lower ( $P < .10$ ) for sows fed Diet 2 as compared with those fed corn or naked oats. Addition of fat to the barley-SBM diet increased ( $P < .10$ ) litter weaning weight, weight gain, and average pig weight. Survival to weaning (91.0, 91.4, 91.3, and 94.7%) and no. of pigs weaned (9.9, 9.9, 9.9, and 10.3) were greater ( $P < .10$ ) for sows fed naked oats as compared with the other energy sources. Return-to-estrus interval was not affected ( $P > .10$ ) by energy sources. On day 14 of lactation, milk was collected from 20 sows/treatment. Milk Dry Matter (DM) (19.1, 18.6, 18.6, and 19.0%) and fat (8.28, 7.48, 7.89, and 8.30%) were increased ( $P < .10$ ) for sows fed corn or naked oat as compared with those fed Diet 2. Adding fat to the barley-SBM diet numerically increased milk DM and fat. Milk crude protein (5.29, 4.90, 4.98, and 4.92%) was greater ( $P < .02$ ) for sows fed corn as compared with the other energy sources. These results suggest that naked oat and barley with added fat compare favorably to corn as energy sources for lactating sows.

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[Back to 1998 Research Reports Table of Contents](#)

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