

Director's Digest



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Date: June, 1992

No. 232

PRACTICAL STARTER DIETS FOR EARLY WEANED PIGS

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COMMENT: This article was taken from the February 1987 issue of Hog Farm Management magazine.

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Webster's definition of weaning is "to accustom; to take food other than by suckling." Unfortunately many hog producers make little attempt to accustom pigs to the change from a liquid milk diet to one made mainly from plant products. Yet more hog producers are weaning their pigs early (before four weeks of age).

The nursery is the weak link in hog operations, and producers often notice that pigs experience a postweaning growth "lag." More attention to proper started diets, along with good environment and health programs, can minimize this problem.

Before weaning, the sow provides the pig with about 16 equally spaced, highly digestible liquid meals. This diet contains about 30 percent protein, 35 percent fat, and 25 percent lactose on a dry matter basis. Then suddenly, the pig must cope with a low fat, low lactose, high carbohydrate solid feed. With this abrupt change, it's no wonder that the pig is not able to find the feeder, establish a social order, adjust to the new surroundings and gain weight in the first week after weaning!

During the last decade, major research efforts have been undertaken at universities to find nutrition programs that will support satisfactory performance of

the early weaned pig. At Kansas State University, scientists have evaluated a three-phase starter program. It takes into account the special nutritional requirements of the young pig. This program is quite practical, but ultimately, the individual producer must assess whether it's economical to use complex diets for three-week old pigs.

PHASE ONE: HIGH NUTRIENT DENSITY DIET: Starter diets for pigs weaned at 14 to 21 days have been the topic of considerable speculation because of the variation in results. A High-nutrient density diet (HNDD) is a type of milk-based diet intended to improve the initial starter pig performance. Various formulations of HNDD have been tried in commercial swine production units.

There are two kinds of HNDD that have been formulated for early-weaned pigs. The first approach has been to formulate diets that are as similar as possible to sow's milk, in a dry form. These diets work well, but they're very costly. The other kind of HNDD is formulated with an understanding of the early weaned pig's special needs, but with more attention to cost.

Research shows an advantage to feeding HNDD to smaller or younger pigs in the initial part of the starter period. The improved performance is probably due to the fact that the pig is better able to use lactose from milk products contained in the HNDD than starch from cereal grains that make up the traditional corn-soy starter. And because milk protein is digested more easily than cereals, and HNDD contains a larger complement of amino acids, the pig's daily amino acid intake is enhanced. On a HNDD diet, the pig can use these nutrients for early growth, and avoid growth "lag".

PHASE TWO: WHEY STARTER The transition from a HNDD diet to a more economical starter diet is critical for this three-step program. Studies conducted at Kentucky, Ohio State, Purdue and Cornell Universities show the benefit of adding dried whey (minimum of 10 percent) to starter rations. In a Kansas study, dried whey was added at 0, 10, 20, and 30 percent to a milo-soybeanmeal diet. A level of 1.2 percent lysine was maintained and four percent corn oil was added to each diet. Pigs fed diets containing 20 percent whey gained faster than pigs fed diets containing none or ten percent added whey. So we currently advise 15 to 20 percent added dry whey for the Phase Two diet.

The lack of response to dried whey in some studies may be related to the type of whey used. A recent study demonstrated no response to a feed grade whey, whereas an edible grade dried whey improved daily gain and feed intake. The different whey sources may be due to high drying temperatures, salt or ash content.

Several experiments have been conducted to determine the lysine requirements for pigs weaned at three to five weeks of age. Results indicated that 1.25 percent lysine was needed to maximize daily gain and feed efficiency.

For the Phase Two diet, adding an antibiotic is generally beneficial. And research shows that there is a beneficial interaction between copper sulfate and dried whey.

Trials from Ohio State show that the weaned pig's selenium is between .3 and .5 ppm. In 1982, FDA approved the addition of .3 ppm for weanling pig diets. Adding .3 ppm selenium to diets has been shown to increase feed efficiency by five percent, and boost daily gain by seven percent.

Too often, hog producers are so impressed with the Phase Two diet that they feed it until pigs weigh 40 to 50 pounds. But this increases the cost of production considerably.

PHASE THREE: SIMPLE STARTER DIET: The real objective of the Phase One and Phase Two diets are to entice the pigs to start eating solid feed. Obviously, the ingredients used in the first two diets must match the developing digestive system of the young pig. Once nursery pigs are on feed, the goal should be to feed the most cost-effective diet.

Once the pig reaches about 25 pounds, feed intake is not as critical in diet formulation. A grain-soy diet will ensure the most economical performance. Copper sulfate is still included in this diet.

If properly used in the nursery phase, the high nutrient density diet will represent less than one percent of the total feed needed to produce a market hog.

DIET COMPOSITIONS: The Phase One diet should contain 20 to 25 percent protein. The lysine level should be 1.5 to 1.6 percent. Added fat level should be eight to 10 percent. Fifteen to 25 percent dried edible whey can be used, and also include 10 to 25 percent dried skim milk. Include fish meal at up to three percent.

Copper (ppm) level should be 190 to 260. And for optimum performance, use 40,000 International Units of vitamin E, and .3 ppm. selenium. Include an antibacterial.

For the Phase Two diet, it should include 18 percent protein, 1.25 percent lysine, three to five percent added fat, 15 percent whey, no dried skim milk, three to five fish meal, 190 to 260 ppm copper, 40,000 units of vitamin E, .3 ppm. selenium, and an antibacterial.

For Phase Three (up to 50 pounds body weight), use 18 percent protein, 1.10 percent lysine, no added fat, up to five percent whey 190 to 260 ppm of copper, 40,000 units of vitamin E, .3 ppm selenium and an antibiotic. For this diet, a meal form is preferable; in the first two diets, a pellet works better.

Controversy surrounds the issue of what source of fat is "ideal" for the newly-weaned pig. Part of the discrepancy in fat sources by the young pig maybe due to the level of fat in experimental diets and the methods of determining fat digestion. Because the fat content in sow's milk can be as high as 40 percent of total dry matter, digestion of fat by the young pig shouldn't be a limiting factor. Research at Kansas State has shown fat digestibility to be quite high for the newly weaned pig.

The HNDD is formulated with the pig's metabolism and enzyme system in mind. Economic considerations of pork production are forcing hog producers to be concerned with saving pigs. Because the digestive capacity of the pig plays a large role in successful weaning, this three-step program can be useful for early weaned pigs.