

# HOG PRODUCERS!

Have higher feed prices and lower market hog prices got you down? Are you concerned about how much it costs you to grow a pound of pork? If you are, take a moment to read some facts about the most successful hog feeding program ever developed by Master Mix Research.

## DISCUSSION

The primary objective at Feed Research is the formulation of swine feed to produce pork at the lowest possible cost. The protein and energy portions of swine feeds represent 80 - 90 percent of the total feed cost. Therefore, the greatest potential for reducing the feed cost per pound of pork involves protein and energy. The research and development of FARMIX was directed at the protein portion to eliminate excess protein and maintain optimum performance at the same time.

Amino acids are the building blocks for protein in the animal's body. The amino acids are classified as essential and nonessential, but both groups are used for protein synthesis. The pig requires 10 essential amino acids to be present in the feed, but can make the nonessential amino acids. Historically, swine rations have been formulated to meet a certain crude protein level. More recently, total levels of a few essential amino acids, in addition to protein, have been used in formulation. The shortcomings with this type of formulation are: 1) The relationship between crude protein and individual amino acid levels and their availability to the pig are not necessarily in direct proportion; 2) Using a minimum crude protein level to meet the first limiting amino acid (lysine) may result in excesses of some other essential amino acids; 3) Formulation based on traditional protein value will be more volatile in price during periods of rising costs for protein ingredients.

When the above factors were taken into consideration, a new method of computer formulation was developed using the following basis:

1. The requirements for the ten essential amino acids were met and protein levels were disregarded.
2. The requirements for the ten essential amino acids were met according to a certain pattern (balance) to minimize excesses of some amino acids that could be detrimental to performance.
3. The level of Available Amino Acids in various feedstuffs was used in formulation. Total levels of amino acids are determined in the lab whereas Available Amino Acid values are determined with feeding trials.

### Available Amino Acid Research

We started with the concept that swine feeds could be formulated on an available amino acid basis. Next came an intensive review of the scientific literature. Much credit should be given the many university and government researchers all over the world for their basic research on the available amino acid content of individual feed ingredients. However, a practical program was needed to supplement this basic research and translate it into usable form.

Three years of intensive research, with approximately 9,000 pigs, were required to refine the values for available amino acids. The thrust of the experimental work at Master Mix Research was directed at three areas:

1. Redefine the minimum amino acid requirements of the ten essential amino acids.
2. Determine the amino acid requirements according to a specific pattern (balance). In addition to meeting the minimum amino acid requirements, we found the ratios between certain amino acids to be very critical for maximum performance. A similar example is the importance of Ca:P ratio. The reduction of excessive amounts of some essential amino acids results in improved performance and reduced cost of gain.
3. Determine the availability of each essential amino acid for every major ingredient using the pig as the ultimate judge. Thus a new set of values (available amino acid levels) were developed and used which are different from the total (analytical) values found in the literature.
4. Determine pigs' requirements on the AAA basis.

With this information at hand, the computer formulation of swine feeds on the AAA basis was feasible. Rations formulated on this concept were tested repeatedly against rations formulated on a protein basis. The results were improved performance, leaner pigs and lower cost per pound of gain.

### FARMIX Pork Program

FARMIX represents the first application of the available amino acid concept for swine feeds. Some of the advantages of the new method of formulation (AAA basis) realized in the FARMIX program are the following:

1. Excesses of essential amino acids are minimized.
2. Ingredients are evaluated on their true contribution of amino acids for protein synthesis.
3. Performance of the pig is more consistent.
4. The impact of ingredient price fluctuation is reduced because of increased ingredient flexibility.
5. FARMIX is manufactured in crumbled form for more efficient handling, mixing and distribution.
6. FARMIX is a flexible program since only one concentrate and two pacs (Swine Breeder Pac and FARMIX Starter Pac) are required for the entire herd.

The amino acid density in FARMIX was selected to give excellent performance when mixed at the recommended rates. Under good management, the pork producer can expect average daily gains of 1.72 and feed to gain ratios of 3.08 when pigs are fed from 50 pounds to market weight.

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