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Evaluating Additives for Swine Rations

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Swine producers today are making decisions about feed additives, which are promoted as an aid in reducing feed required per pound of gain. Additives on the market have been selected from a large number investigated for use in treatment of swine diseases or as growth promoters.

In general, additives available for swine producers fall in the following classifications: anthelmintics, antibiotics, arsenicals, nitrofurans and sulfa compounds. You can use additives on the market with reliability when recommended rates and specifications are followed. They have been approved for use in swine feeds by the Food and Drug Administration and their effectiveness and safety have been reviewed thoroughly.

Why use additives?

Based on years of research and development with non-nutritive chemical compounds, swine researchers have concluded that proper use of feed additives can make a significant contribution toward increasing efficiency in swine production. Most swine producers agree with this conclusion. These additives have been helpful particularly as producers have modified the type of swine production by increasing numbers, changing feeding practices, shifting from pasture to dry lot, going to multiple farrowing and concentrating more animals in less space.

Producers have purchased additives mainly based on their demonstrated ability to improve performance in increasing growth rate, improving feed conversion and reducing disease and social stress.

Common sources of feed additives

Producers have several potential sources of feed additives. They can be purchased:

- In a complete mixed feed,
- In supplements for mixing with a grain source or
- In a separate premixed form to be added either to supplements or complete feeds.

In addition, some medicated feeds are formulated to be fed alone for short periods of time.

The source of additives used depends on the method of feeding and the facilities you have available. In general, cost is reduced when high-concentration sources are used. It is critical that these sources are mixed and distributed well in the complete feed.

Whatever source you use, consider carefully and determine:

- Cost
- Which additives are present

- Actual amounts of additive ingredients in a ton of complete mixed feed

Feed tags must show a list of actual amounts of medication and antibiotics. For comparison purposes, these should be converted to amounts of additives in a ton of feed as it is fed.

Evaluating additive reliability

In the case of parasite infestations or certain specific disease situations in swine, additives that have proven effective for the specific condition should be chosen. Correctly diagnosing the trouble and matching the right additive are important. In some cases, you might need veterinary consultation.

An example would be in selecting a wormer that has been proven effective against the species of internal parasites your herd has. When the proper anthelmintic is used according to directions, you can expect good results. Wormers designed for roundworms, for example, may have limited effect on a whipworm infestation.

Antibiotics are one of the most common feed additives. An abundance of research work indicates the effectiveness of antibiotic additives in improving gains and feed efficiency of swine. With normal hogs, the biggest effect of antibiotics is increased daily gain. There is less effect on feed efficiency. Greatest response usually occurs during the early growth period. Pigs that are doing poorly generally are more responsive to antibiotic feeding than thrifty pigs.

Selection of a specific antibiotic is determined to a large extent by your experience and the effectiveness of various brand name antibiotics on particular farms and management systems. Some of the older individual antibiotics, such as aureomycin and terramycin, are still effective. Missouri producers in general have had somewhat better response from mixtures, such as the penicillin-streptomycin-aureomycin combination, and some of the newer products such as the tylan sulfates. There also have been favorable reports on other antibiotics and combinations.

There is a wide variation in how additives are listed on various feed formulation tags. Always look closely at the medications listed on the tag to determine which additive is present. The way they are listed varies among companies. For easier comparisons of amounts present and costs, calculate the actual amount of additive in a ton of complete feed fed.

Surveillance of pork carcasses for drug residues, particularly sulfa, is increasing. Be particularly careful to use correct labels, and observe withdrawal times for these products.

Calculating antibiotic levels

You should have some idea of the going rate for additives in a concentrated form. With this figure in mind, it is fairly easy to compare antibiotics in supplements or in a complete mixed feed. The following examples illustrate how this is done:

Example 1

Swine premix A can be purchased for \$9 per 60-pound bag. In addition to the active drug ingredient, it contains some calcium, phosphorus, salt, iodine, vitamins and trace minerals. The active drug ingredient is tylosin, and the level listed on the tag is 667 grams per ton. Instructions are to mix one bag or 60 pounds of premix with 300 pounds of soybean meal and 1,640 pounds of corn. Two questions should be answered in evaluating this premix:

- What is the actual number of grams of the additive per ton of complete mixed feed?
- What is the cost of the premix per ton of complete mixed feed?

In this case, the 667 grams of tylosin would be available if a ton or 2,000 pounds of the premix were fed. Since each ton of complete feed will contain only 60 pounds of the premix, we find there are only 20 grams of tylosin in a ton of complete feed.

- Tylosin — 667 grams per ton of premix. How much in 60 pounds?

$$\frac{667}{2000} = \frac{x}{60}$$

$$2,000(x) = 40,020$$

$$x = 20 \text{ grams in 60 pounds of premix}$$

$$x = 20 \text{ grams per ton of complete mix feed}$$

Example 2

Premix B is in a 50-pound bag. The actual drug ingredient is Carbodox at 500 grams per ton. It also contains 35 percent crude protein and is designed to be mixed as follows:

200 pounds premix B

200 pounds SBOM

1,600 pounds grain

Calculating as shown above, we find that in a ton of complete mixed feed, you would have 50 grams of Carbodox per ton of feed.

- Carbodox — 500 grams per ton of premix. How much in 200 pounds?

$$\frac{500}{2000} = \frac{x}{200}$$

$$x = 50 \text{ grams in 200 pounds}$$

$$x = 50 \text{ grams per ton of complete mixed feed}$$

Fifty grams per ton is the approved level of Carbodox for the control of swine dysentery or bloody scours. Ten to 25 grams per ton is the level approved for increased weight gain and improved feed efficiency. Purchase of this product may depend on your problems with dysentery. You also should compare the cost of this additive with others designed to improve gain and feed efficiency.

Example 3

Some additives will be expressed in percent on the feed tag. On a ton of this premix, active drug ingredients are: chlorotetracycline, 100 grams; sulfamethazine, 0.011 percent; penicillin, 50 grams.

This is a complete mixed creep feed, so it is obvious that you have 100 grams of chlorotetracycline and 50 grams of penicillin in a ton of feed as fed. The sulfamethazine would be about 100 grams a ton:

$$1. 2,000 \text{ pounds} \times 0.011 \text{ percent} = 0.22 \text{ pound sulfamethazine}$$

$$2. 1.0 \text{ pound} = 454 \text{ grams}$$

$$3. 0.22 \text{ pound} \times 454 \text{ grams} = 99.88 \text{ grams}$$

$$= 100 \text{ grams sulfamethazine per ton of feed}$$

Thus, the total level of antibiotics in this creep feed would be 250 grams a ton — a high level of antibiotic ingredients.

Cost of this feed is \$7.50 a hundredweight or \$150 a ton. This, of course, is the cost of the feed and the antibiotic combined. By having an idea of the value of this level of antibiotic, however, you can make a more accurate comparison of this feed with another.

When purchasing additives in complete supplements or complete mixed feed, also have some idea of the value of other ingredients, particularly vitamins and minerals.

Example 4

Using average research results, producers can calculate approximate dollar advantages using antibiotics as growth promoters shown in this example of pigs 15 to 57 pounds.

1. Reduced days to market	7.2	= \$1.80 value
2. Reduced feed in starter phase	6.7	= 0.60
Possible savings		= \$2.40
3. Cost to medicate feed @ 12 per ton		= 0.54
4. Net return to 57-pound pig		= \$1.86

Where expensive antibiotics are used in the finishing phase, costs may exceed savings.

Summary

- Feed additives are effective and economical in improving performance and increasing profit in swine production.
- Use anthelmintics and medicative additives only on a "need" basis and for specific conditions.
- Antibiotic additives are recommended, particularly for creep, starter and growing rations. Research indicates a response to antibiotics through the entire feeding. Lower levels can be used in finishing rations to reduce cost. Research on antibiotic value in sow rations has not been conclusive.
- Antibiotics are particularly effective when sanitation is below normal and stress is above normal.
- Use only approved additives at levels recommended.
- Calculate actual antibiotic levels on an as-fed basis and compare cost.
- Where on-farm formulations are used, take particular care in mixing to ensure proper distribution of the additive.
- Observe any special directions, particularly withdrawal requirements.

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Related MU Extension publications

- G2353, Antibiotics and Other Additives for Swine: Food Safety Considerations
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G2353>
- G2358, Preventing Sulfa Residues in Pork
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G2358>

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