



DO PIGS GET ENOUGH VITAMINS?

Elementary history lessons taught us that scurvy was a major risk in early ocean voyages.

Sea captains learned to prevent the problem in future trips by having the sailors consume things such as sauerkraut, lime juice, or citrus fruits.

In 1928, vitamin C, the key compound that prevents scurvy, was isolated. During the next 30-40 years, more and more vitamins were identified. And our approach to formulating animal diets became simpler.

Instead of adding things such as tankage, linseed meal, and corn distillers grains, we add now vitamin premixes. You would think that by now we'd have all the vitamins identified and the daily requirements pretty much figured out. In fact, by providing the vitamins listed in the NRC for Swine (1998) in the correct amounts, pigs will grow and reproduce normally.

But there is research, a lot of it,

demonstrating that higher amounts are beneficial. Here's a brief summary of several studies on selected vitamins.

Vitamin A

This vital nutrient affects bone growth, reproduction, and the health of cell membranes. A similar compound that is easily converted to vitamin A is beta carotene. In fact, this is the compound normally present in feedstuffs that helps the animal meet the vitamin A requirement.

Studies show that embryo survival and litter size is improved with extra amounts of vitamin A or beta carotene (vitamin A is less expensive). Some key points of the research:

- The effect is most pronounced in sows that have had at least two litters
- Injections (at weaning) work better than putting the same amount in the diet
- An effective injection dose of vitamin A seems to be 1 million IU.

A word of caution. Some vitamins can be toxic at high doses, and vitamin A is one of them — do not exceed 1 million IU per sow. Also, a lot of the research on vitamin A has been conducted with a special vitamin A injectable preparation. It is likely, but not certain, that commercially available injectable vitamin A would have similar effects.

Vitamin E

Like vitamin A, E is vital in maintaining cell membranes and it is available in both dietary and injectable forms. But the benefi-

cial effects of vitamin E are broader than that of vitamin A, and at least for the pig, vitamin E has no obvious toxic effects.

Recent research shows that vitamin E injections (1,000-2,000 IU) given to the sow at weaning can produce larger litters, heavier pigs at birth, and reduce pre-weaning mortality. Likewise, 60,000 IU of vitamin E/ton of feed can improve litter size by .8 pig compared to sows receiving the NRC recommended level of 15,000 IU/ton of feed.

The beneficial effects are due in part to enhanced immune function in the pigs and improved milking ability in the sows (vitamin E reduces the incidence of MMA). Young pigs benefit from extra vitamin E, as injections of 1,000 IU/pig at weaning improved growth rate in one trial. Vitamin E also improves pork quality and shelf life.

Because vitamin E is an antioxidant, when fed at high levels (180,000 IU/ton of feed), the muscle tissue also has higher levels of this natural preservative. The result: a slow-down in the

aging process of pork (less lipid oxidation and undesirable color changes). Extra vitamin E does not appear to overcome the quality problems associated with the porcine stress syndrome.

Biotin

Not long ago, no one bothered to include this vitamin in swine diets. In recent years, we've learned that biotin improves hoof health and reproductive efficiency.

Between 1977 and 1990, there have been reports of at least 18 experiments. Eleven experiments showed increases in the total number of pigs farrowed, 16 showed improvements in pigs born live, and 11 demonstrated increases in the number weaned.

The amount of biotin added in the feed ranged from 90 to 500 milligrams per ton. In another study with growing pigs, adding 200 milligrams of biotin/ton of feed appeared to maximize growth performance in young growing pigs, compared to that of lower and higher doses.

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