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Extra Vitamin E Helps Young Pigs Survive Weaning

Producers frequently stumped by the sudden death of a seemingly healthy and rapidly growing young pig should consider the lack of vitamin E as a suspect, says Don Mahan, animal scientist, The Ohio State University.

Vitamin E serves as an antioxidant in pigs, protecting cell tissue from damage from free radicals generated during metabolism. If a pig is vitamin E deficient, muscle, liver and other tissue will begin to break down and can result in the animal's death.

"When a pig is born, it's already deficient in vitamin E because a minimal amount of the fat-soluble products that contain vitamin E can transfer through the placenta of the sow during pregnancy," Mahan says. "After birth, the young pigs get their vitamin E from the colostrum and milk of the sow. If the sow has low body stores or is fed low dietary levels of vitamin E, then the young pig also will be low in vitamin E when it is removed from the sow during weaning."

The blood and tissue vitamin E concentrations of pigs decline fairly dramatically during weaning, so that is the phase where a pig is most susceptible to vitamin E deficiency problems, he says. About two percent of young pigs die during this postweaning period because of low levels of vitamin E received from the sow or selenium element. The selenium element serves a similar purpose as vitamin E in a pig's body.

Mahan and other researchers at The Ohio State University have studied the effects of vitamin E and selenium deficiencies in pigs for nearly ten years. He, Ohio State postdoctoral student Ivan Moreira, and Ohio State graduate research associates San Ching and Ted Wiseman, recently began looking at ways to correct low vitamin E levels in weaned pigs. Wiseman presented the results of their research at the American Society of Animal Science and American Dairy Science Association Midwest Sectional meeting in Des Moines, Iowa, March 15-17, 1999.

"We decided to correct the problem by adding vitamin E to the diets or drinking water of two-week-old weaned pigs," Mahan says. "Previous research showed that when vitamin E is added to a diet, the serum values of vitamin E in a pig's blood did not increase much until a couple weeks after weaning. So we decided to add various grades of vitamin E up to some very high levels to see what amount of vitamin E added to the diet or drinking water would raise vitamin E blood serum up to its necessary level within a pig."

The National Research Council recommends a pig's diet contain 16 international units (IU) of vitamin E per kilogram (kg) of diet. The dietary levels the Ohio State researchers studied were 0, 20, 40, 60, 80, 100, 150, and 200 IU per kg of feed. They found it took almost 80 IU per kg of vitamin E in the weaned pigs' diets to get blood serum values that would prevent a deficiency.

"We looked at drinking water because even though a pig may not be eating well, generally it will always consume water," he says. "The diet and drinking water values we found that resulted in appropriate vitamin E blood serum levels were both much higher than what the NRC has established for dietary requirements."

Feed companies could use this information to increase the amount of vitamin E added to their products, Mahan says. It could help veterinarians who recommend injections and suggest feed requirements to producers. Producers also could add vitamin E to the drinking water of their young pigs if they suspect a vitamin E deficiency.

All grains fed to pigs generally have a low vitamin E content, so finding animals low in vitamin E can be common, he says. Vitamin E is found in the oil of feed crops, so soybeans generally have higher levels of the vitamin. But, vitamin E can be destroyed easily when exposed to air, reducing effective levels in feeds. The Ohio State University research was partially sponsored by BASF, a vitamin manufacturer.