



NEWS TO USE

Injectable Vitamins A and E Enhances Gilt and Sow Productivity

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Introduction

Vitamins A and E are essential nutrients for reproduction and fetal growth and development. In 1985, Brief and Chew reported that injectable vitamin A was more effective than dietary vitamin A in improving embryo survival in vitamin A-deficient gilts. Injectable vitamin E prior to farrowing has been shown to improve vitamin E levels in colostrum (Chung and Mahan 1995) resulting in higher vitamin E levels in the nursing piglets. Chew, 1993 and Mahan and Vallet (1997) offer excellent reviews on the needs for vitamin A during conception and fetal development.

It appears that vitamin A administered prior to breeding enhances embryo survival. Coffey and Britt (1993) found that vitamin A injections prior to breeding improved number of pigs born live. Injecting gilts and sows with vitamin A prior to breeding has been shown to improve embryo survival resulting in increased litter size in some (Whaley et al., 1997; Darroch et al., 1998), but not all studies (Tokach et al., 1994; Pusateri et al., 1999). Tonn et al., 1994 found that injecting vitamin A at weaning increased the number of embryos recovered at 11.5 days after the onset of estrus (16.5 vs 10.8, P<.05), and percent embryo survival (78% vs 66%, P<.10).

Increasing dietary levels of vitamin A does not result in increased blood concentrations of retinol (Hoppe et al., 1992), suggesting that retinol is maintained at a relatively constant level in relationship to intake. Injection of a biologically available source of vitamin A offers an effective means to deliver larger quantities of vitamin A resulting in dramatic increases in circulating vitamin A levels (retinol and esters).

VITAL E+A – A proven, bioavailable source of injectable vitamins A and E.

Since vitamins A and E are both important nutrients during the critical time around breeding, **VITAL E+A** was specifically developed to provide bioavailable sources of vitamins A and E for use in gilts and sows. The product provides **200,000 I.U. vitamin A and 300 I.U. vitamin E per mL**. VITAL E+A has been tested and shown to be bioavailable in swine and cattle (Data on File, Stuart Products, Inc.).

The effectiveness of **VITAL E+A** was compared to a commercial vitamin A+D injectable formulation containing 500,000 I.U. vitamin A and 75,000 I.U. vitamin D per mL in a study conducted by Mahan, Ohio State University (unpublished). In the study, 9 gilts, averaging 250 lbs were maintained on a typical gilt developer ration prior to initiation of the study. Three gilts were randomly assigned to one of three treatments: control, VITAL E+A

E+A (5 mL), or Injectable A+D (2 mL). Each treated gilt received 1,000,000 I.U. vitamin A. Due to the different vitamin E levels in the products, the **VITAL E+A**-injected gilts received 1500 I.U. vitamin E, while the A+D-injected gilts received approximately 10 I.U. All animals received the appropriate treatment via a single intramuscular injection in the neck area. Animals were bled at times 0 and 24, 72, and 168 hours post-injection.

Figure 1 shows the vitamin A status of the three treatment groups. Vitamin A status was dramatically improved

during the first two post-injection times with VITAL E+A but not with the A+D injection. After 168 hours (7 days) there were no differences among the treatment groups. As expected, figure 2 shows the vitamin E status in the three treatment groups.

Figure 1. Vitamin A status in gilts injected with either VITAL E+A or Injectable A+D

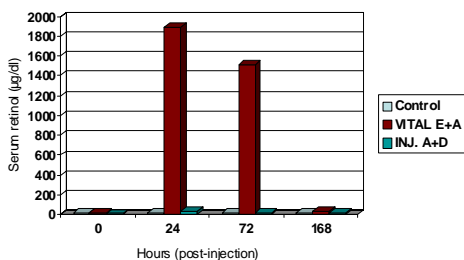
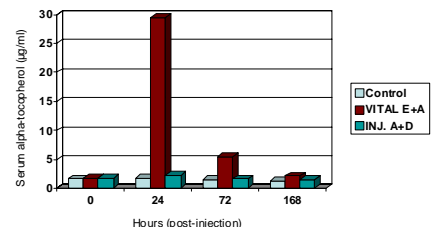


Figure 2. Vitamin E status in gilts injected with either VITAL E+A or Injectable A+D



Serum tocopherol remained dramatically higher in the VITAL E-A-injected pigs compared to the other treatments through the first 72 hours of the study. This study and others have demonstrated that injectable vitamin E and A products do not have equal bioavailability. In a study in cows, two competitive products did not enhance either vitamin A or vitamin E status post-injection (Data on file, Stuart Products, Inc.).

Field Demonstration with **VITAL E+A**

Parameter	VITAL E+A	Non-injected
Breeding Performance		
Number farrowed	251	267
% Repeat Services	12.7	15.6
% Bred by Day 7	82.2	72.9
Avg. Non-productive days	42.8 (-36.8%)	67.7
Farrowing Performance		
Avg. Pigs/litter	10.7 (+3.9%)	10.3
Avg. born live/litter	10.0	9.7
Farrowing rate	86.9 (+18.1%)	73.6
Weaning Performance		
Pigs weaned/female/year	23.3 (+2.3 pigs)	21.0

In a study conducted at a 725-sow herd, approximately 250 sows and gilts were assigned to one of two treatment groups according to parity. One group received a 5 ml subcutaneous injection of **VITAL E+A** (1,000,000 I.U. vitamin A and 1500 I.U. vitamin E) on either day of weaning for sows or approximately 7 days prior to expected estrus in gilts. The other group of approximately 250 sows and gilts served as controls. All other parameters remained equal. The trial was monitored through PigCHAMP. Results of the study are presented in Table One. As in other similar demonstrations, these data show that a strategic pre-breeding injection of vitamins A and E offers an economical means to increase breeding performance by reducing non-productive sow days and increasing pigs per liter.

Several demonstrations have been conducted showing the benefit of injecting gilts and sows with vitamins A and E prior to and at breeding. The overall mean of the studies improved number of pigs weaned per year by more than one pig per sow-year.

Recommendation for Using **VITAL E+A**

Gilts: 5 ml approx. 7 days before breeding; and 5 ml at breeding.
Sows: 5 ml at weaning; and 5 ml at breeding.

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