



EMCELLE[®] TOCOPHEROL (*d-alpha-tocopherol*) COMPARED TO SYNTHETIC VITAMIN E FOR TURKEY BREEDER HENS AND PROGENY

E. Kane and R. L. Stuart
Stuart Products, Inc.
Bedford, Texas

Abstract

EMCELLE[®] TOCOPHEROL (*d-alpha-tocopherol*) when supplemented in drinking water improved vitamin E status of breeders, fertile eggs and poults when compared to a similar I.U. intake of synthetic vitamin E (dl-alpha-tocopheryl acetate) added to feed. Due to the unstable form of vitamin E in EMCELLE TOCOPHEROL, the only route of administration is via drinking water.

Introduction

Vitamin E has been shown to be necessary for optimum fertility and hatchability of fertile eggs, thus breeder rations typically are supplemented with two to four times more vitamin E than layer rations; however, feeding incrementally higher levels of synthetic vitamin E acetate did not improve vitamin E status of poults during the first 10 days post-hatch (Soto-Salanova, 1995). The water supplementation of micellized, nonesterified vitamin E (**EMCELLE TOCOPHEROL**) has been shown to be more efficiently utilized than synthetic vitamin E-acetate in poults and chicks (Soto-Salanova, 1995, Waibel et al, 1994, Maurice and Lightsey, 2002). The purpose of this study was to compare two sources of vitamin E on vitamin E utilization by turkey breeders and their hatchlings.

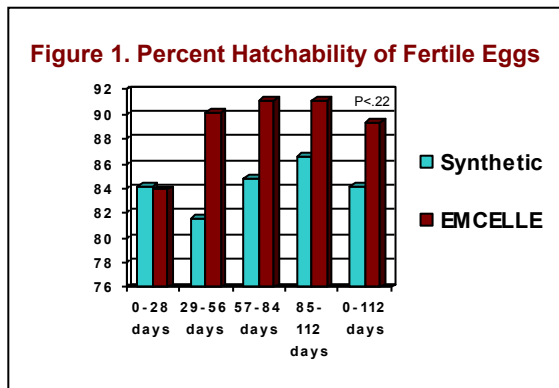
Study Design

To measure the utilization of two sources of vitamin E in breeder hens and progeny, a 112-day study was conducted at the University of Minnesota. Eighty Nicholas breeder turkey hens, two groups of 20 hens per pen, were fed either 60 I.U. synthetic vitamin E acetate (dl-alpha-tocopheryl acetate) per kg feed or 30 I.U. micellized d-alpha-tocopherol (EMCELLE TOCOPHEROL) per liter drinking water beginning at 35 weeks of age. Eggs were collected during four 28-day periods during the study. At the end of the laying study, alpha-tocopherol was measured in breeder serum, liver, heart, breast and egg yolks. Percent egg production, fertility, and hatchability were reported for each 28-day period and totals for the 112-day study.

Eggs hatched during the 3rd period were used in an 8-day progeny study to measure effectiveness of the two sources of vitamin E in poults from each of the two treatments fed to hens, resulting in four treatment groups. To measure efficacy of the two sources of vitamin E, poult serum and livers were analyzed for alpha-tocopherol at hatch and 8 days of age.

Results and Discussion

Percent egg production and fertility were not significantly different in the study. Hatchability of eggs from EMCELLE-supplemented hens was improved 6.1% ($P < .22$) compared to those hens fed synthetic vitamin E acetate (Figure 1). In addition,



EMCELLE-supplemented hens had higher egg yolk-tocopherol than those fed synthetic vitamin E acetate which reflected in higher serum and liver-tocopherol levels in poults at hatch (Figure 2).

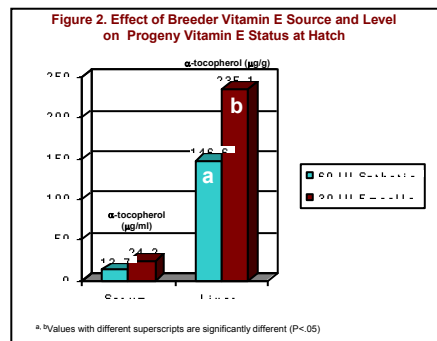


Table 1. Effect of Breeder and Progeny Vitamin E Source on Progeny Vitamin E Status

Poult Treatment	Breeder Treatment	
	60 I.U. Synthetic	30 I.U. Emcelle
	Serum α -tocopherol (μ g/ml)	
60 I.U. Synthetic/ kg diet	2.66 ^a	4.91 ^b
30 I.U. Emcelle/ liter water	6.78 ^c	8.86 ^d
^{a,b,c,d} Means with different superscripts are significantly different (P<0.05)		

The progeny phase of the study involved feeding poult from the two hen treatments either 60 I.U. synthetic vitamin E acetate per kg feed or 30 I.U. EMCELLE TOCOPHEROL per liter water for eight days. This resulted in four different treatment combinations.

EMCELLE was more efficiently utilized and transferred in poult compared to synthetic vitamin E acetate (Table 1). The treatment combination that resulted in the highest vitamin E status was when both the hens and poult had received vitamin E from EMCELLE TOCOPHEROL and the treatment combination that resulted in the lowest vitamin E status was when both hens and poult had received vitamin E from synthetic vitamin E acetate in the feed (8.86 vs. 2.66 μ g alpha-tocopherol per ml). Soto-Salanova, 1995 found that poult fed EMCELLE from day 3 through day 10 had higher serum and tissue tocopherol compared to poult fed various levels of synthetic E up to 115 I.U. per kg diet.

Water administered EMCELLE TOCOPHEROL (micellized, non-esterified natural vitamin E) was better utilized by breeder hens and their progeny when compared to an equal intake of synthetic vitamin E acetate. This study showed the effectiveness of **EMCELLE[®] TOCOPHEROL** for breeder hens to enhance hatchability, egg yolk vitamin E content, and vitamin E status of poult at hatch.

Recommendations

For breeders, supplement **EMCELLE TOCOPHEROL** in drinking water at 50 I.U. per liter starting two to four weeks prior to egg collection and throughout the laying cycle. Based on a 6.1% improved hatchability, the value of extra poult equates to more than \$3.00 return per dollar invested.

For poult, supplement **EMCELLE TOCOPHEROL** at 50-100 I.U. per liter drinking water from day 3 through day 14. Previous research has shown that improved vitamin E status improve immune status in young poult.

To Place an Order

Telephone (800) 747-4538 or (817) 590-2907; or mail original or confirming orders and inquiries to STUART PRODUCTS, INC., 112 Bedford Road, Bedford, Texas 76022.

E-mail: RobStuart@Stuartproducts.com. Website: www.Stuartproducts.com

References

- Maurice D. and S. Lightsey, 2002. Comparative efficacy of liquid vitamin E products in chicks. Unpublished.
- Soto-Salanova, M. 1995. Vitamin E in young turkeys: A reassessment of the requirement. Dissertation. Iowa State University, Ames, Iowa.
- Soto-Salanova, M. and J. Sell. 1996. Efficacy of dietary and injected vitamin E for poult. J. Poultry Sci. 75:1393-1403
- Waibel, P., L. Felice, J. Brannon, F. Chen and M. Chen. 1994. Vitamin E forms for turkeys. J. Appl. Poult. Res. 3:261.

