Sponsors

University of Minnesota
College of Veterinary Medicine

College of Agricultural, Food and Environmental Sciences

Extension Service

Swine Center

Editors
W. Christopher Scruton
Stephen Claas

Layout
David Brown

Logo Design
Ruth Cronje, and Jan Swanson;
based on the original design by Dr. Robert Dunlop

Cover Design
Shawn Welch

EFFECTS OF DIETARY ORGANIC OR INORGANIC SELENIUM FED TO REPRODUCING SOWS ON RESULTING RETENTION OF SELENIUM BY THE FETUS AND SELENIUM TRANSFER TO THE MILKS

Donald C. Mahan, and J. C. Peters
The Ohio State University, Columbus, Ohio 43210, USA

Introduction

Vitamin E and Se deficiencies have plagued the swine industry even when diets are fortified with vitamin E (to 100 IU/kg) and the approved Se level (0.30 ppm). Although both nutrients enhance the immunogenic capability of the animal, their efficacy in reducing the incidence of the deficiency in their progeny has been questioned. Recent research has shown that organic Se is retained better by market pigs than inorganic Se. Other research suggests that organic Se increases the milk Se of sows. This research will investigate the effects of inorganic or organic Se fed to sows on fetal and mammary transfer of Se over 4-parities.

Materials and Methods

A total of 15 sows/ treatment group were fed two sources of Se (sodium selenite or Sel-Plex ™) at 0.15 or 0.30 ppm Se for 4 parities. A fifth group was fed a non Se-fortified basal diet while another group was fed a diet with both Se sources each at 0.15 ppm Se. Five pigs from each sow treatment group in parity 4 were killed at birth for Se determination. In addition, sow colostrum and milk (weaning) was collected and analyzed for Se.

Results and Discussion

As the dietary level of Se increased, an increase ($P<0.01$) in neonatal liver Se resulted with a greater increase when organic Se was fed. Total Se in the neonate increased ($P<0.01$) when sows were fed either Se source, but the increase was approximately doubled when organic Se was fed (Figure 1, $P< 0.01$). Milk Se was greater ($P<0.01$) when organic Se was fed and continued elevated over the 4-parity period, but it was lower and declined with advancing parity when inorganic Se was fed (Figure 2, $P<0.01$). The diet with both Se sources responded similarly to the diet with 0.15 ppm organic Se.

Other sow reproductive and Se traits (i.e., litter size, serum GSH-Px,) plateaued ($P<0.01$) at the 0.15 ppm Se level, but Se retention in the fetus, transfer of Se to the colostrum and milk, and sow tissue Se concentrations continued to increase to the 0.30 ppm Se level when the organic, not when the inorganic Se source was fed.

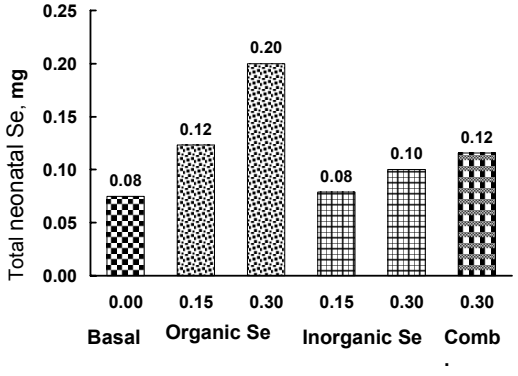

Figure 1. Total Se content in neonatal pigs (n = 5/ treatment group).

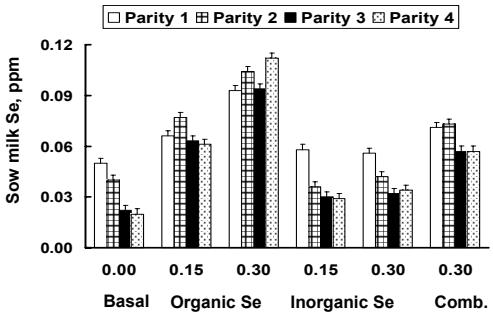

Figure 2. Milk Se content of sows fed Se sources and levels over 4 parities.

Reference

Mahan, D. C. 2000. Effect or organic and inorganic Se sources and levels on sow milk Se contents. *J. Anim. Sci.* 78:110-119.