Feeding Supplemental Vitamin D₃ Improves Pork Longissimus Muscle Quality

Department of Animal Sciences, Auburn University, AL 36849

Abstract

Pigs fed 80,000 IU/kg supplemental vitamin D₃ for four weeks showed increased plasma concentrations of 25-hydroxyvitamin D₃ (25OHD) compared to pigs fed the 40 diet. Pigs fed 80 diet had lower (P<0.01) cholesterol and triglyceride concentrations than pigs fed the CON diet. Moreover, pigs on the 80 diet had greater (P<0.05) pelvic bone mineral density than pigs fed the 40 or CON diet.

Introduction

One of the most important processing steps in pork processing is waterholding capacity (WHC). The waterholding capacity of pork longissimus muscle is determined using the Carver Press method (Grau and Hamm, 1953). A 0.5 g sample of longissimus muscle was placed between two pieces of desiccated filter paper. The sample and filter paper were placed between two sheets of hard clear plastic and pressed at 500 psi for one minute. The procedure was according to the methods of Solomon and Dunn (1988). Microscopic photographs were taken with a Nikon Eclipse E800 microscope fitted with a 100W mercury lamp.

Materials and Methods

Sensory evaluation of boneless top loin chops was conducted by a six-member trained sensory panel made up of meat science faculty and graduate students. Chops were served in a random order, and panel members were blinded to diet treatments. Results for performance and carcass measurements can be found in Table 1. Feeding pigs supplemental vitamin D₃ at the 80 concentration tended to decrease (P = 0.08) cook loss compared to the 40 diet. Feeding pigs supplemental vitamin D₃ at the 80 concentration tended to decrease (P = 0.08) cook loss compared to the 40 diet. Cook loss was measured as the percent of pre-cooked weight lost during cooking and averaged across the two chops for each pig.

Discussion

Vitamin D₃ is required for the regulation of plasma calcium and phosphorus concentrations necessary to maintain healthy bone structure in humans and pigs (Engstrom et al., 1986). According to NRC (1998), the safe upper limit for dietary vitamin D₃ intake for pigs is 33,000 IU/kg for less than 60 days and 2,200 IU/kg for more than 60 days. Results from the present study were formulated to contain 0 IU/kg of added vitamin D₃ to the base diet (CON), 40,000 IU/kg of added vitamin D₃ (40), and 80,000 IU/kg of added vitamin D₃.

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Results

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