Abstract

Increased mortality attributed to a vitamin D induced hypocalcemia in pigs has prompted research of new procedures to supplement vitamin D. The current objective was to assess efficacy of a single oral mega dose of vitamin D at birth on serum 25-OH D concentrations and bone mineral content and bone ash at weaning. Within litters (n=51), half of the pigs were either not dosed (Ctl, n=296) or given a single 1 mL dose of 40,000 IU vitamin D3 at birth. In 2011 gestation and lactation diets were formulated at 1,750 IU D3/kg for 5 d before weaning and at 2,750 IU D3/kg for a 35 d nursery trial. Blood and bone tissue were collected at weaning from 29 pigs (17 treatment). Serum 25-OH D concentrations were approximately 3 X lower in Ctl vs +D pigs (P < 0.001) in Cox vs bone ash, (P= 0.265). In a previous experiment (Crenshaw et al., 2009. JAS 87:(E-Suppl 2)510), femurs and fibulas were scanned by DXA and then excised (200 C) after drying and fat extraction. DXA scans of excised bones accurately predicted both the femur and fibula ash content. Femur, however, provided a more accurate prediction of whole bone mass. Serum 25-OH D concentrations were correlated with BMC in the lower ranges and underestimated pig BMC in the upper ranges. Thus, the femur may reliably predict BMC in young pigs.

Vitamin D Treatments

Pigs were either not dosed (Ctl, n=196) or were given a single 1 mL dose of 40,000 IU vitamin D3 (CAD, n=301) at birth. Pig treatments were applied within litters (n=15 litters).

Bone Ash from Pigs at Weaning

An oral dose of vitamin D at birth increased serum 25-OH D at weaning but failed to alter bone mineral density in pigs. Whole body DXA scans of pigs were scanned on rice bags to simulate soft tissue. The femur was scanned with the head of the femur at the horizontal plane of the rice bag. Femur were aligned on the table or rice bag to simulate whole pig scans. Adapted from Hagen. 2012.

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