

P095 **Optimization of dietary phosphorus and calcium to maximize their utilization by growing pigs for sustainable farming.** E. Gonzalo*, M.-P. Létourneau-Montminy, C. Pomar, *Agriculture and Agri-Food Canada, Sherbrooke.*

The impact of dietary calcium (Ca) and P deficiency (depletion) on Ca and P efficiency during a recovery period (repletion) was studied in 60 male pigs (iBW 14.0 ± 1.6 kg, fBW 67.6 ± 6.1 kg) randomly assigned to one of the 4 treatment groups. Pigs were fed fulfilling the estimated nutrient requirements (INRA, 2005) with a control diet (C) or a low-P diet (L) providing 60% of the digestible P and total Ca of C diet during 2 feeding phases of 28 d (15-35 and 35-70 kg BW) in a cross-over design consisting in CC, CL, LC and LL groups. Total body and L2-L4 lumbar region bone mineral content (BMC) and density (BMD) was estimated at the beginning and at the end of each feeding phase by dual x-ray absorptiometry. During the 1st feeding phase pigs fed with C diet had 4 times higher BMC deposition (8.6 vs 2.1 g/d; $P < 0.001$) which resulted at the end of the period in higher ($P < 0.001$) total body BMC and BMD (53% and 15%, respectively) than L fed pigs. Also, L diet fed pigs tend to have lower ADG (698 vs. 751 g/d, $P = 0.057$) than C fed pigs. During the 2nd feeding period CC diets fed pigs had higher total body BMC and BMD (20% and 11% respectively, $P < 0.001$) and tend to have higher ADG (6%, $P = 0.08$) than LC pigs while Δ BMC was similar. When comparing CL fed pigs with those fed in the LC sequence, the latter tend to have lower feed conversion ratio (7%, $P = 0.06$), and a higher Δ BMC (48%, $P < 0.001$). Pigs fed LC compared to LL diet presented higher total body BMC and BMD (34% and 13% respectively, $P < 0.001$) at the end of the 2nd feeding period, due to a higher Δ BMC (21.6 vs 11.9 g/d, $P < 0.001$), and a lower FCR (5%, $P < 0.001$). Results showed that pigs fed the diet deficient in Ca and P from 15 to 35 kg followed by C diet from 35 to 70 kg, are not efficient enough to compensate the bone mineral deficit. Further research is needed to study if LC pigs would recover bone deficit with excess mineral in C diet during the 2nd feeding phase. The results also underline the need to study the consequences of this early P deficiency until slaughter.

Key Words: depletion-repletion, phosphorus, pigs