

## Abstract submission – DPP 2015

### **Donor human milk and bovine colostrum improve body growth and gut health relative to infant formula in preterm pigs**

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#### **Abstract:**

Mother's own milk as the optimal diet for preterm infants is often limited following preterm delivery. Infant formula (IF) predisposes to gut dysfunction and necrotizing enterocolitis (NEC), while donor human milk (DM) and bovine colostrum (BC) might work as dietary alternatives. Thus, we hypothesized that DM and BC improve growth, NEC resistance and expression of intestinal immune genes in the postnatal period. Methods: Forty-seven caesarean-delivered preterm pigs were fed increasing doses (3-15 mL/kg/3h) of three diets: IF (n=14), BC (n=18), or DM (n=15). Diarrhoea and weight gain were recorded daily, and the intestine was collected for analysis after 11 days. Results: Incidence of diarrhoea was low in BC pigs, relative to both HM and IF pigs ( $P<0.05$ ), with corresponding effects on weight gain (+30, -3, -12 g/day, respectively). BC pigs were constipated with high levels of colonic short-chain fatty acids ( $P<0.05$ , relative to the other groups). NEC incidence was lowest in DM pigs (40 vs. 67-79% in BC and IF,  $P<0.05$ ). Diet affected expression of 4 of 18 investigated genes. IF increased the expression of *TFF3*, *IL8*, and *MUC2* relative to the other diets; *TNF- $\alpha$* , *IL17* and  *$\beta$ -defensin* expression was higher in NEC-pigs ( $P<0.05$ ). Conclusion: The immature intestine is diet-sensitive, and IF induces diarrhoea and NEC with few alterations in immune gene expression. BC and HM show better intestinal health and growth, although neither diet supports optimal health beyond the first week after preterm birth. Careful adjustment of timing, volume, and diet are required to support health in preterm neonates.