

Abstract no.: 41665

Abstract title: ¹H-NMR metabolomic study of Large White and Meishan pigs in late gestation: part 2- sow endometrium

Author: Imbert, A., Duprat, N., Marty-Gasset, N., Gress, L., Canlet, C., Billon, Y., Vialaneix, N., Bonnefont, C.M.D., Bonnet, A., Liaubet, L.

Preferred presentation: Poster

Preferred session: 25: Omics and integrative analyses towards understanding inter-organ cross-talk and whole body physiology of livestock

Abstract text: The risk of piglet mortality is highest in the first few days after birth. Therefore, late gestation development is of high importance for piglet survival. The endometrium is the maternal tissue that is in direct contact with the placenta of each fetus and thus is the matrix for feto-maternal interactions. To better understand the relationship between fetal development and piglet maturity, endometrial tissues from Large White (LW) sows, with high piglet mortality, were compared to that from Meishan (MS) sows, a breed with less neonatal mortality. 224 endometrial samples were collected from 28 sows (14 LW and 14 MS) at 90 or 110 days of gestation (dg, birth at 114 days), each sample being in direct contact with each of the 224 placentas. Hydrophilic metabolites were extracted and ¹H-NMR spectra were acquired. Raw spectra were processed using the ASICS R package to identify and quantify 46 metabolites. A multivariate analysis revealed a main effect of gestational age (13.1% on 1st axis). Mixed models were used to identify 21 metabolites with differential concentrations between the two following conditions, day of gestation and genotype, their interaction, and with the sow as a random effect (one model fitted to each metabolite independently followed by a correction for multiple testing, FDR < 0.05). As expected, fructose was more abundant at 90 dg than at 110 dg. Conversely, L-glutathione-reduced was more concentrated at 110 dg than at 90 dg and more concentrated in MS than in LW sows. Citrate and L-glycine were more concentrated in MS sows than in LW sows at both stages of gestation. A more detailed biological interpretation of the metabolomic data is in progress. This research was part of the ANR-20-CE20-0020-01 project COLOcATION.