The effect of high-fat diet on the composition of the gut microbiota in cloned and non-cloned pigs of lean and obese phenotype - DTU Orbit (19/01/2019)

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The aim of this study was to investigate the effect of high-fat-high-energy diet on cloned and non-cloned domestic pigs of both lean and obese phenotype and to evaluate if the lean cloned pigs had a lower inter-individual variation as compared with non-cloned pigs. The microbiota of colon and terminal ileum was investigated in cloned and non-cloned pigs that received a high-fat-high-energy diet with either restricted or ad libitum access to feed, resulting in lean and obese phenotypes, respectively. The fecal microbiota of lean pigs was investigated by terminal restriction fragment length polymorphism (T-RFLP). The intestinal microbiota of lean and obese cloned and non-cloned pigs was analyzed by quantitative real time PCR and a novel high-throughput qPCR platform (Fluidigm). Principal component analysis (PCA) of the T-RFLP profiles revealed that lean cloned and non-cloned pigs had a different overall composition of their gut microbiota. The colon of lean cloned pigs contained relatively more bacteria belonging to the phylum Firmicutes and less from the phylum Bacteroidetes than obese cloned pigs as estimated by qPCR. Fluidigm qPCR results revealed differences in specific bacterial groups in the gut microbiota of both lean and obese pigs. Our results suggest that high-fat-high-energy diet is associated with changes in the gut microbiota even in the absence of obesity. Overall, the cloned pigs had a different gut microbiota from that of non-cloned pigs. To our knowledge this is the first study to investigate the gut microbiota of cloned domestic pigs of lean and obese phenotype.

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