



ANIMAL PHYSIOLOGY, HEALTH AND WELFARE – MICROBIOME

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Rumen protozoal communities produce a large amount of hydrogen as part of metabolism. Due to interspecies hydrogen transfer with their symbiotic partners (methanogens), protozoa play an important role in rumen methanogenesis. Therefore, in order to reduce ruminal methane emission, a thorough understanding of rumen protozoal community composition is very important. This study was aiming to monitor seven lactating Italian Simmental cows during different physiological stages, to observe possible modifications in their metabolically active rumen protozoal communities, based on 18S rRNA amplicon sequencing. The experiment was divided into 3 parts depending on different physiological stages of dairy cows: late lactation (248–332 DIM), dry period (8–51 days before calving), and postpartum (15–34 days after calving). Rumen fluid samples were collected using an oesophageal probe from each cow, maintained on a specific total mixed ration (TMR) at least for 10 days before collection. RNA extraction was done in duplicates and used as template for synthesis of cDNA, that was later amplified by PCR using specific primers for eukaryotic hypervariable V9 region of 18S rRNA gene, followed by sequencing using 300 bp paired-end Illumina Miseq platform. Furthermore, during each part of the experiment, the total number of protozoa in the rumen fluid samples was also counted manually using compound microscope. The physiological stages of dairy cows were found to have a clear effect on rumen protozoal community composition, with the most prominent effects observed on the relative abundance of following protozoal phyla (Ciliophora and Amoebozoa), and genera (Dasytricha, Eudiplodinium, Ostracodinium and Entamoeba). In conclusion, dry period resulted in higher protozoa number and an increase in abundance of ciliated protozoan populations. This study has potential future implications in microbial programming process, through controlled early life feeding managements to decrease hydrogen producing ciliated protozoans populations which play a key role in rumen methanogenesis, thereby improving health and production.

O036

Growth performance and gut microbiota in post-weaning piglets fed diets containing bakery/confectionary former food products as cereal substitute

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Former Foodstuffs (FFPs) are products that have lost their commercial value on the human consumption market, due to for example production errors. However, their nutritional value for animal feed purposes is not at all affected. Biscuits, bread, cereals, chocolate bars, pasta, savoury snacks and sweets leftovers from the food industry are all FFPs, high in energy content in the form of sugar, starch, oil or fat. For this reason, they can be considered an appealing alternative feed ingredient as valuable energy sources. This study aimed to investigate the effects of FFPs on growth performance and gut microbiota when they partially replace conventional cereal grains in post-weaning piglet's diets. After an adaptation period, 12 post-weaning piglets were housed for 16 days in individual pen and were fed two diets, including a standard wheat-barley-corn meal control diet and a diet containing 30% FFPs partially substituting for conventional cereals. The diets were isoenergetic and isonitrogenous and met NRC (2012) requirements. For the growth performance evaluation, individual feed intake and piglet's body weight (BW, kg) were recorded, while average daily gain (ADG kg/day), average daily feed intake (ADFI kg/day) and feed conversion ratio (FCR kg/kg) have been calculated. Stool samples have been collected for the next generation sequencing of the variable regions V3 and V4 of the 16S rRNA gene in order to characterise the faecal microbiota composition. At the end of the experiment, no differences in BW, ADG and ADFI have been observed between groups. Conversely, piglets on the FFP diet showed a better FCR ($p < .05$). The gut microbiota did not show differences in microbial taxa composition, while further investigations are necessary to clarify the effects of FFPs on gut bacterial abundance and biodiversity.

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O037

Administration of green tea and pomegranate extract in drinking water on broiler growth performance, total blood antioxidant activity and gut microbiota

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The plant-derived products as green tea extracts have been extensively used in poultry nutrition due to their antioxidant, anti-viral and anticoccidial properties. Furthermore, they have the capacity to lower cholesterol and reduce lipid peroxide level in plasma and meat, and improve the growth performance and meat quality of