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Feeding dairy ewes with a diet containing agri-food co-products: Implications on rumen metabolism

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Feeding a mixture of agri-food co-products as ingredients of a concentrate feed in replacement of soybean meal and corn grain is considered an interesting strategy in dairy ewes to improve dietary sustainability. This study aimed to assess the effect of such dietary replacement on volatile fatty acids (VFA), fatty acids (FA) concentrations, microbiota composition, and methane production from the rumen fluid of grazing dairy ewes. A total of 24 dairy ewes were allotted to CTRL (concentrate based on a mixture of barley, corn and soybean meal) or EXP (concentrate based on a mixture of olive pomace, tomato peels, distillers, wheat bran, and rice husk) groups, balanced for milk yield (1.1 ± 0.5 kg) and days in milk (82.3 ± 31.7). The trial lasted six weeks, and samples of rumen fluid were collected at the beginning and the end of the trial. Total VFA and methane productions were similar between the two groups, indicating similar fermentation patterns of the two diets despite EXP having a higher content of fibre. The presence of co-products in the EXP diet also provided a greater amount of PUFA, which determined a different biohydrogenation pattern that, in turn, resulted in higher overall concentrations of C18:1 trans-FA and a lower content of PUFA in rumen liquor. Rumen microbial community was also characterized by high-throughput sequencing of 16S rRNA gene.

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Utilization of orange peels as a high value secondary feedstuff for dairy sheep

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In a worldwide context of increasing demand for animal-derived products, speculations of the feed market and climatic risks, sheep farming faces the daily challenge of ensuring its sustainability, while food by-products arise as alternative feeds, due to their nutritional value and wide availability. The aim of the present study was to evaluate the use of orange peels from a Greek orange juice industry as a high value secondary feedstuff for dairy sheep, within a circular economy approach. Enzymatically hydrolyzed (processed) and unprocessed orange peels were introduced to 2 groups (n=12/group) of dairy ewes of Chios breed at 11% DM inclusion levels (groups P & U), while group C of 12 ewes served as controls. All rations were isoenergetic and isonitrogenous and ewes were individually fed for 84 days. Milk production and composition were measured biweekly. Although fat corrected milk yield was significantly higher ($p < 0.05$) between U and C treatments on Day 14 only, at most samplings milk fat of U group was significantly higher ($p < 0.05$) than the C and milk protein was higher at all samplings for U group ($p > 0.05$). It appears that unprocessed orange peel feed could increase acetic acid production in the rumen, thus increasing milk fat content. In conclusion, orange peels could potentially be a promising secondary feedstuff that can be used as a sustainable alternative ingredient for dairy sheep nutrition. Acknowledgement: EU PRIMA Program (grant agreement n°2013).