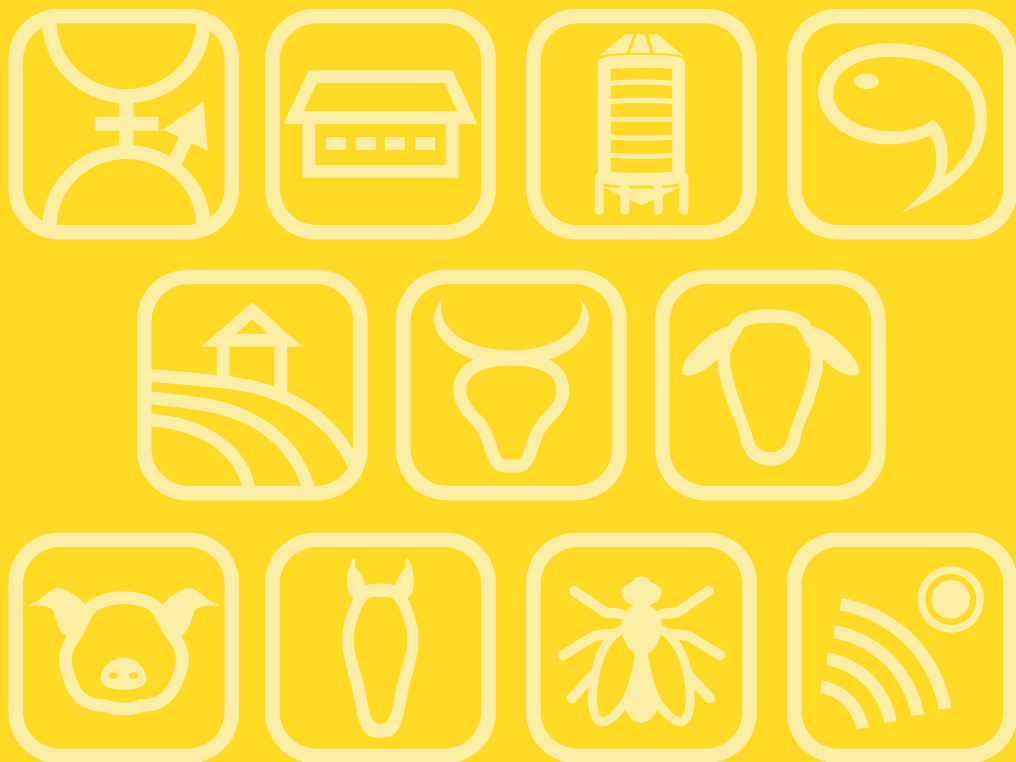


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Variability in chemical composition of barley rootlets from different malting plants

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Barley rootlets (BR) are the dried shoots and rootlets of sprouted grain generated in the malting process previous to beer brewing process. Although BR are used in ruminant feeding, information about their chemical composition is limited. This work aimed to analyze the variability in chemical composition of 10 samples of BR obtained from 3 Spanish malting plants in different periods. Samples were ground to pass a 1 mm screen and analyzed for dry matter (DM), ash, crude protein (CP), neutral detergent fiber (NDF), acid detergent fiber (ADF) and ether extract (EE). The DM content ranged from 94.7 to 96.7% (average 95.6%) and the ash content ranged from 5.43 to 7.10% (average 6.14%), whereas CP ranged from 25.1 to 39.3%, with average value of 31.4% (all values on DM basis). The average contents of NDF, ADF and EE were 48.6 (41.7 – 56.0%), 15.7 (11.4 – 20.5%) and 2.27 (1.65 – 2.75%), respectively. Coefficient of variation was high for CP (12.1%), ADF (15.2%) and EE (14.1%), but low for DM (0.62%). Both the DM and CP values of our samples were higher than those reported by Feedipedia ranging from 86.0 to 94.9% for DM (average 89.9%) and from 17.3 to 30.7 for CP (average 23.5% of DM). In contrast, ash, NDF, ADF and EE contents were similar to those in INRA-CIRAD-AFZ Tables (average 5.9, 44.6, 16.5 and 1.8% of DM, respectively). A negative linear correlation was observed between NDF and CP content ($r = -0.633$; $P = 0.049$). The results indicate high variability in chemical composition of BR showing differences in CP, ADF and EE content compared with available data. These variations may be due to differences in the composition of the barley grains used in different malting batches, as well as in the malting process performed at each malting plant.

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Poster 25

Ruminal fermentation and biohydrogenation in ewes fed with sainfoin pellets under water restriction

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Sainfoin (*Onobrychis viciifolia*), a Mediterranean legume forage, has a great interest as feed due to its content of condensed tannins (CT), which are known to be able to interfere in ruminal processes, affecting fermentation and lipid metabolism. The aim of this study was to characterize the rumen fermentation and biohydrogenation in two groups of adult Rasa Aragonesa ewes (60 ± 2.7 kg BW), under water restriction and parasitized, fed with straw plus 300 g of cereal-concentrate ($n=20$; CONTROL) or 300 g of sainfoin pellets ($n=20$; SAINFOIN) with 16.5 g CT/kg DM. The trial lasted 8 weeks, 4 of which under 40% water restriction. After that, the ewes were slaughtered and their ruminal content was extracted to analyse pH, volatile fatty acids (VFA), and fatty acid (FA) profile in the rumen. The SAINFOIN diet reduced the total VFA and the proportions butyric, isobutyric, valeric, and isovaleric acid ($P < 0.05$), increased the proportion of propionic acid ($P < 0.01$), and tended to increase the production of acetic acid ($P < 0.10$). Regarding the fatty acid profile, SAINFOIN ewes presented lower proportions of C18:0 and trans-monounsaturated FA ($P < 0.05$), suggesting a reduction of the ruminal biohydrogenation caused by the presence of sainfoin CT. Besides, SAINFOIN diet increased the proportion of polyunsaturated fatty acids (PUFA) $n3$ ($P < 0.001$), that could enhance the immune function, greatly reducing the PUFA $n6/n3$, and also led to a higher total conjugated linoleic acid percentage (CLA; $P < 0.001$) and its main FA, CLA $c9t11$. Although sainfoin supplementation reduced total VFA, the many findings in the ruminal FAs suggest promising improvements concerning the ruminal FA metabolism that could help these ewes to cope with different stresses.