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Effect of stoned olive oil cake on rumen bacterial community: preliminary results of an *in vitro* study

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Understanding the effect of diet on the biohydrogenation (BH) process is important to optimize the production of healthful food from ruminant livestock. From literature, it is well known that the availability of C18:1 trans11 (vaccenic acid, VA) and C18:2 cis9 trans11 (rumenic acid) in ruminant products is limited as consequence of their hydrogenation to C18:0 (stearic acid) by rumen microbial activity. Rumen fermentation can be modulated by presence in feeds of bioactive molecules that are able to affect the structure and diversity of rumen microbial populations. In an *in vitro* trial the effect of stoned virgin olive cake (SVOC), rich in polyphenols, that are potentially able to interfere with rumen fermentation involved in BH processes and methane production, has been investigated. The inclusion of SVOC in feeds at the level of 50 g/kg and 90 g/kg induced changes in fatty acid profile and in microbial populations; in particular, the contemporary disappear of a band (DGGE) related to *Butyrivibrio proteoclasticus* and the accumulation of VA (+50%) has been observed. Moreover, a depression of other microbial groups mainly related to the orders Clostridiales and Neisseriales has been detected.

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Influence of dietary crude protein and rumen protected conjugated linoleic acid on rumination activity, feed intake and rumen fluid parameters in lactating cows

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This trial compared the effects of dietary protein level and rumen protected conjugated linoleic acid (rpCLA) on dry matter intake (DMI), rumination activity, rumen fluid parameters and milk yield. Twenty Holstein-Friesian cows, homogeneous for parity, body weight, body condition score, DIM, and milk yield, housed in pens of 5 were fed 4 diets containing 15% (CP15) or 12% CP (CP12) supplemented or not with 80 g/d of rpCLA, following a 4×4 Latin Square design. Each period lasted 2 weeks for adaptation and one for experimental measurements. The CP12 diet was formulated from CP15 by replacing soybean with barley meal, and they contained similar NDF content (37% DM). Dry matter intake, rumination activity, and milk yield were daily monitored. Rumen fluid was analysed for pH, volatile fatty acids (VFA) and ammonia N (N-NH3), milk was analyzed for proximate composition. Data were averaged by group of cows and analyzed with a general linear model considering period, dietary treatment and group as sources of variation. The reduction of dietary CP content did not influence DMI, increased rumination activity from 16.8 to 19.8 min/kg DMI (+18%; P=0.009), increased rumen fluid pH (P=0.034), decreased rumen fluid N-NH3 (P<0.001), did not influence milk yield (P=0.072) and milk fat content (P=0.896), but slightly reduced milk protein from 3.53 to 3.36% (P=0.026). Addition of rpCLA reduced DMI from 21.4 to 19.6 kg/d (P=0.018), did not affect rumination activity, rumen fluid pH and N-NH3, and VFA contents, milk yield and milk protein content but reduced milk fat content (P=0.003). It was shown that when a reduction of rumen degradable N is applied feed degradation in the rumen would be supported by a compensative increase of rumination activity. The effect of rpCLA on DMI could reflect a reduced energy requirement for milk fat synthesis induced by these bioactive molecules.

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Use of different approaches to calculate the rate of neutral detergent fibre digestion and implication on estimate of neutral detergent fibre digested in rumen

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The rate of NDF digestion (kd, /h) should be considered in nutritional dynamic models for a correct nutritional estimate of feeds used in diet formulation. A first-order mathematical model is used to calculate kd. Generally, inputs required are NDF, lignin and NDF digestibility (NDFD) measured at different rumen incubation times. These parameters are needed to calculate available NDF at time 0 and at each incubation time and indigestible NDF (iNDF, calculated as 2.4 times lignin content of NDF). We previously showed how different calculation procedures (3h fixed *vs* estimated Lag, single *vs* multiple time-point calculations or estimated *vs* measured iNDF) strongly influence kd estimate, suggesting the best way to compute kd valuation is through the use of a multiple time-point calculation with estimated Lag and measured iNDF. In the current work, five different mathematical approaches were used to calculate kd in 4 feeds (*i.e.*, corn silage,