Book of Abstracts of the 64th Annual Meeting of the European Federation of Animal Science

Book of abstracts No. 19 (2013)
Nantes, France
26 - 30 August 2013

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Nutritional evaluation of several extruded linseed product by *in vitro* gas production technique

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The present study was conducted to determine effect of different processing and extrusion method on *in vitro* digestibility of organic matter (DOM), metabolizable energy (ME) and net energy for lactation (NEL) values. Commercial products containing extruded linseed including Nutex Compact® (containing 56% extruded linseed) and LINOMAX®, and a pure extruded linseed (155-160 °C for 15-20 s) sample were evaluated. Samples grounded to pass through a 1-mm screen and subjected to *in vitro* gas production technique. Mixed rumen micro-biota obtained from four ruminally fistulated Holstein steers (420±13 kg, body weight) fed twice daily a diet containing 5.8 kg alfalfa hay and 3.0 kg concentrate mixture). Approximately 200 mg of each sample was weighed into a 125 ml flask (n=9) and then 50 ml rumen fluid-buffer mixture (in a 1:2 ratio) added into each bottle under CO_2 flush, followed by incubation in a water bath at 38.6 °C. Gas volume was recorded at 24 h of incubation. Metabolizable energy (ME), NE_L and DOM values of the samples were calculated using following equations: ME (MJ/kg DM) = 1.56 + 0.1390 GP + 0.0074 XP + 0.0178 XL; NE_L (MJ/kg DM) = 0.1010 GP + 0.0051 XP + 0.011 XL; DOM (g/kg DM) = 14.88 + 0.8893 GP + 0.0448 XP + 0.0651XA. Where GP is net gas produced after 24 h of incubation (ml/0.2 g DM), and XP, XL and XA are crude protein, crud fat and ash content of the feed (g/kg DM), respectively. The results showed that gas production for Nutex Compact®, LINOMAX® and pure extruded linseed samples at 24 hours were 21.4^a, 14.8^b and 12.7^c ml/0.2 g; respectively (P<0.05). The DOM of samples were 49.06^a, 39.6^b and $31.28\%^c$; respectively. The ME contents were 10.47^a, 10.62^a and 9.11^b MJ/kg DM, respectively and the NE_L contents were 5.97^a, 5.92^a and 4.87^b MJ/kg DM, respectively (P<0.05)

Use of electronic nose for corn silage screening

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Corn silages were randomly collected in the Po valley during the year 2012. Samples were taken from 18 concrete wall bunkers and from 3 different positions of freshly cut face: core or C, (1 meter high from the bottom), side or S (1.5 meter high from the bottom, 0.3 meter from the walls) and top or T (0.5 meter from the top). Collected samples were stored at 4 °C and subjected within 24 h to electronic nose analysis (Pen3 – Airsense AnalyticsGmbH, Schwerin, Germany) equipped with metal oxide semiconductor sensors (W1C, W3C, W6S, W5C, W1S, W1W, W2S, W2W, W3S). Each sample was weighed (20 g) into airtight glass jar, then jars were closed and let it stand at room temperature for 30 minutes to allow for headspace equilibrium. After reaching equilibrium, the headspace gas was pumped to sensors of the electronic nose (flow rate 400 ml/min). The measurement phase lasted 60 seconds with data collection interval of 1 second. A stand-by phase (320 seconds) was observed between each sample reading to allow for a cleaning of the system. Only one reading (at 59 second) for each sensor entered a data matrix of 54 rows (silage samples) and 9 columns (sensors). A correlation matrix was obtained from collected data and a principal component analysis (PCA) was performed using the FACTOR procedure of SAS. The PRIN method with Kaiser's criterion (eigenvalue≥1.00) and the orthogonal Varimax rotation were used to extract latent constructs and to produce loading vectors and sample scores. Three principal components (PC) were extracted: PC1 (W1C, W3C, W5C, W1S, W2S, W2W; eigenvalue=5.60), PC2 (W6S, W3S; eigenvalue=1.75), PC3 (W1W; eigenvalue=1.00). The PC1 allowed for clustering the silage samples into two populations being C and S+T, whereas the PC2 and PC3 tended to discriminate between S and T samples. Results suggest electronic nose could be a valuable laboratory tool for discriminating corn silages exposed to different preservation processes.