

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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Influence of prolonged vs. Instant use of Natuzyme® on *in vitro* fermentation of two ruminant's diets

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The influence of prolonged pre-treatment vs. Instant administration of Natuzyme® (Bioproton Co.) on *in vitro* gas production (GP, ml/200 mg DM), dry matter disappearance (IVDMD) methane production (MET, ml/200 mg DM) and fermentation efficiency as mg IVDMD per ml MET (FE) of various ruminant diets containing wheat straw (D1: 6.2% wheat straw, 39.4% corn silage) or alfalfa hay (D2: 21.3% alfalfa, 37.2% corn silage) at half time (t1/2) of gas production. Approximately 200 mg (DM) of each diet was weighted into a 125 ml serum bottle at 0.0 or 24 h prior to incubation (T1 and T2, respectively). Each bottle received 2.52 g/kg DM of the enzyme in an aqueous suspension to maintain same moisture content maintain same moisture content (40%), run=3 and n=3. The gas production procedure was followed by pipetting buffered rumen fluid into the bottles and incubated at 38.6 °C for desired intervals. In a pre-trial, pressure of gas was recorded at 2, 4, 6, 8, 10, 12, 24, 48, 72 and 96 h of incubation. Pressure data was converted to volume using an experimental curve and was modeled to estimate t1/2. Main trial incubation was continued until t1/2 and volumes of GP and ME, and residual DM was measured. Data were analyzed as 2×2 factorial arrangement in a completely randomized design. Results revealed that D2 comparing to D1, had higher GP (43.95 vs. 43.18) and Met (12.10 vs. 8.62) but less IVDMD (30.90 vs. 33.90) and FE (5.35 vs. 8.24) (P<0.05). In addition T1 compared to T2 had higher GP (47.43 vs. 36.70) and less IVDMD (30.90 vs. 33.90) (P<0.05) and Met and FE did not differ for T1 and T2. Although T2 in D1 decreased FE (6.44 vs. 10.46) and increased Met (10.38 vs. 6.85) comparing to T1 (P<0.05), situation was different for D2 and FE was higher for T2 in D2 (6.64 vs. 4.10) (P<0.05) while Met was not affected. Therefore it seems optimal Pre-treatment duration for Natuzyme® widely depends on diet type and forage content.

Relationship between chemical composition and rumen degradation characteristics of maize silages

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Several *in situ* studies have been conducted on maize silages to determine the effect of individual factors such as maturity stage, chop length and ensiling of maize crop on the rumen degradation of maize silages but the information on the relationship between chemical composition and *in situ* rumen degradation characteristics of maize silages remains scarce. The objective of this study was to determine and describe relationship between the chemical composition and the rumen degradation characteristics of dry matter (DM), organic matter (OM), crude protein (CP), starch and neutral detergent fibre (NDF) of maize silages. Seventy-five maize silage samples were selected, with a broad range in chemical composition and quality parameters. The samples were incubated in the rumen of three cows for 2, 4, 8, 16, 32, 72 and 336 h, using the nylon bag technique under uniform experimental conditions and protocols. The new database with *in situ* rumen degradation characteristics of DM, OM, CP, starch and NDF of the maize silages was obtained under uniform experimental conditions; same cows, same incubation protocol and same chemical analysis procedures. Regression equations were developed with significant predictors (P<0.05) describing strong, moderate and weak relationships between the chemical composition of maize silages and the washout content, rumen undegradable content, potentially rumen degradable content, fractional degradation rate and effective rumen degradability of DM, OM, CP, starch and NDF. The developed regression equations can be used for the rapid assessment and accurate estimation of rumen degradation characteristics of maize silages used in practice.