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Ruminal and post-ruminal disappearance of dry matter and crude protein of coffee pulp using in situ mobile bag technique

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Ruminal and post-ruminal dry matter (DM) and crude protein (CPO) disappearance of coffee pulp (wet extracted coffee bean residual) were determined by in situ mobile bag technique. Samples were analyzed for total N, acid detergent insoluble nitrogen (ADIN), neutral detergent fibre (NDF), ether extract (EE) and ash. Four Holstein steers (395±13 kg) fitted with ruminal fistulae and T-shaped intestinal cannulae were used. Approximately 1.2 g of sample (DM) was placed in polyester bag (3 x 6 cm, pore size of 48 µm, 18 bags per sample), then incubated in the rumen for 12 h. After removal from the rumen, bags were washed and those used for post-ruminal disappearance (9 bags) were inserted into the small intestine via the intestinal cannulae, then removed from the voided feces and rinsed in running water. Nitrogen concentration of pre-incubated and incubated samples was determined. The results indicated that coffee pulp contained low concentration of CP and high densities of structural carbohydrates (CP= 115, NDF=745, EE=110, ADIN=16 and ash=22, g/kg-1). Mean ruminal DM and CP disappearance of coffee pulp was 0.09±0.01 and 0.12±0.08, respectively. Post-ruminal disappearance of DM and CP of ruminal-undegraded sample was 0.06±0.01 and 0.03±0.01, respectively.

Keywords: coffee pulp

Effect of close-up fat plus wheat grain supplementation on first 90 days milk production of Holstein dairy cows.

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Effect of dry dairy cow nutritional status on first 90 days milk production was evaluated in high producing lactating Holstein cows. Data of 4 herds with average 98 milking cows were used. All cows were dried off 40-50 days before calving and moved to the close-up dry herd around 25 days before calving. Close-up dry ration (DM basis) was consisted of 2.2 kg alfalfa hay, 6.1 kg corn silage, 1.9 kg wheat straw and 5.2 kg concentrate (CP: 179 g/kg; ME: 13.1 MJ/kg). In 2 herds, the close-up ration was supplemented with 0.2 kg palm fat (99.5% fat) and 0.5 kg wheat grain. After parturition, all cows were fed a ration (as DM) based on 24% alfalfa hay, 14% corn silage and 60% concentrate (CP: 180 g/kg; ME: 12.2 MJ/kg DM). Weekly milk production was recorded. Data were analyzed using GLM procedure of SAS. First 90 days milk yield was significantly influenced by close-up fat+grain supplementation ($p < 0.05$). Milk yield of fat+grain supplemented and non-supplemented cows was 42.6 and 40.7 kg/d/head, respectively. Therefore, relationship between close-up period fat and wheat grain supplementation and milk production in the first 90 days was a critical point.

Keywords: dry cows, fat

The effect of rumen pH on ruminal lag time of protein degradation of various feeds

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Samples of alfalfa hay, barley grain, soybean meal and fish meal were incubated in the rumen of four holstein steers (300±15 kg, body weight). animals fed diets containing different concentrate:alfalfa hay ratios as 60:40, 70:30, 80:20 and 90:10 in a latin square design. ground (2 mm) samples (5 g dm) were placed in artificial silk bags (10×20 cm, 50 µm pore size) and incubated in the rumen for 0.0, 2, 4, 8, 16, 24, 48, 72 and 96 h (n=8). data of protein degradation were adjusted to a logarithmic model of $[l = ((\ln(d_0) - \ln(d_i)) / -kd)]$; where l = lag time, d_0 = potentially degradable residues, d_i = potentially degradable fraction of protein and kd = fractional rate constant of degeration (/h). minimum daily ruminal ph decreased from 6.40 to 5.34 when level of concentrate was increased. there was a significant difference when ruminal degradation lag time of protein of various feeds was considered. ruminal degradation lag time of protein of alfalfa and soybean meal was markedly increased when rumen ph declined. therefore, it was concluded that the ruminal degradation lag time of protein of the feed samples evaluated in the present study was influenced by the rumen ph.

Keywords: rumen ph, lag time

The Effect of Fluctuations in Rumen pH on *Ruminococcus flavefaciens* populations in rumen fluid as Determined by Real-Time PCR

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The effect of rumen ph on fibrolytic bacteria was studied. four Holstein steers (300±15 kg, body weight) with rumen fistulae were fed experimental diets (7 kg of dm/d) differing in their concentrate (155 g cp/kg dm) to alfalfa hay ratios (60:40, 70:30, 80:20, and 90:10) in a 4×4 latin square design (28 day periods). steer were fed the experimental diets as a total mixed ration. the samples of rumen fluid were taken before the morning feed, and 4 h post-feeding. *r. flavefaciens* dna concentration was measured by real time pcr relative to total bacteria amplification (δδct).the primer sets used in the present study were forward: cgaacggagataatttgagttacttagg and reverse: cggctctgtatgtatgaggtattacc. cycling conditions were 95 °c for 5 min, forty cycles of 95 °c for 15 sec, 61 °c for 1 min and 72 °c for 30 sec; data are express relative to quantification of the total bacterial population. data were analyzed using the glm procedure of sas. the results of the present study demonstrated that increasing the inclusion of concentrate in the diets caused a decrease in rumen ph and the population of *r. plavefaciens* in the free rumen fluid.

Keywords: rumen ph, fibrolytic bacteria.