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## Faecal Inoculum as Alternative Microbial Source for *in vitro* Rumen Fermentation Techniques

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### Abstract

*In vitro* techniques are simple method to determine feed value and most common source of microorganisms are fresh rumen liquor from fistulated animals. However, there is need to use alternative inoculum due to the costly management of fistulated animals, surgical procedure is an highly invasive technique which many countries has restricted its use accounting to animal's welfare issues. Hence, the objective of the present study was to evaluate the degradability of dry matter (DDM), crude protein (DCP) and neutral detergent fiber (DNDF) of three substrates on *in vitro* and *in situ* assays. Experiment was conducted at Laboratory of Animal Nutrition, CENA / USP - Brazil. Four adult fistulated Santa Ines animals were selected as inoculum donors of rumen liquor and fecal inoculum and animals were supplemented with 70:30 ratio of roughage: concentrate. Disappearance percentage of DM, CP and NDF were calculated in terms of weight difference between weighing before and after incubation *in situ* (rumen inoculum) and *in vitro* (fecal inoculum). The study was investigated in a completely randomised design for 24h and 48h incubation with a 3 × 2 factorial arrangement (feeds (100% concentrate, (70:30) maintenance ration and 100% Tifton hay) and two inoculants (rumen and fecal). Treatment means were compared by Tukey test at 5% probability and correlation analysis was performed. There was interaction effect on substrate × inoculum for DDM ( $p < 0.01$ ), DCP ( $p < 0.01$ ) and DNDF ( $p = 0.05$ ). On average, substrates incubated *in situ* resulted in greater potential degradation ( $p < 0.05$ ) compared to *in vitro* incubation for DDM (63.36 × 40.67), DCP (67.78 × 44.63) and DNDF (56.06 × 31.99) with regardless of incubation time. Among the three substrates tested, concentrate had higher DDM values (88.16 and 57.36), DCP (85.38 and 52.04) and DNDF (88.07 and 60.39) followed by maintenance ration (57.30 and 39.10, 70.45 and 64.93; 54.12 and 34.43) and Tifton hay (44.62 and 25.55, 47.52 and 16.91, 27.98 and 1.14) incubated *in situ* or *in vitro* respectively. Our study concludes that although fecal inoculum showed lower degradability of feed constituents, it may be used as alternative microbial source for *in vitro* techniques.

**Keywords:** Alternative inoculum, degradation, faeces