



I-INTERNATIONAL MEETING OF ANIMAL SCIENCE IN SEMI-ARID REGIONS

Universidade Federal do Agreste de Pernambuco – UFape
July 03rd to 05th, 2024, Garanhuns-PE

Area of work: Nutrition and production of ruminants

Título: Fractionation of nitrogen compounds in legumes available for feeding small ruminants in the semi-arid region

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Over the years, methods for evaluating feed for small ruminants have been extensively modified to precisely determine the nutritional values of various foods, allowing their use in the diets of these animals. Among these methods is the CNCPS (Cornell Net Carbohydrate and Protein System), developed based on mechanistic concepts such as the dynamics of nutrients in the gastrointestinal tract of ruminants. Thus, the aim of this study was to evaluate the protein fractionation of Fabaceae species, including cunhã, gliricídia, and jureminha, used in feeding ruminants in the Brazilian semi-arid region. Collections were carried out randomly at the experimental farm of the Federal Rural University of Pernambuco, with four replicates per species, each replicate consisting of a sample of at least three plants. For all species, leaves and stems with a maximum diameter of 5 mm were considered, identified, and sent to the Animal Nutrition Laboratory at the Federal University of Agreste of Pernambuco. The samples were pre-dried in a forced ventilation oven at 55°C for up to 72 hours, then ground in a knife mill (Willye type) with 1 mm sieve openings. Initially, the plants were characterized for their chemical composition: dry matter, protein, neutral detergent fiber, and acid detergent fiber. In the crude protein fractionation, fraction A was obtained after treating one gram of the sample with 100 mL of distilled water for 30 minutes, then adding 20 mL of 10% trichloroacetic acid (TCA) solution and letting it stand for another 30 minutes. It was then filtered through fast-filtering filter paper, and the nitrogen content of the residue was determined. Fraction A was calculated as the difference between the total N content and the TCA-insoluble N. Fraction B1+B2 was obtained using the expression: $B1+B2 = 100 - (A + B3 + C)$; on the other hand, fraction B3 was obtained by the difference between neutral detergent insoluble protein (PIDN) and acid detergent insoluble protein (PIDA), and fraction C was considered as PIDA. Regarding protein fractionation, there was a significant difference ($P < 0.05$), with cunhã showing higher levels of protein fraction A (30.10 g/kg MS), which favors the availability of rapidly degradable proteins in the rumen. Fraction B1+B2 also showed a significant difference ($P < 0.05$), with gliricídia and jureminha presenting higher concentrations of protein fraction B1 + B2, 69.57 and 67.44 g/kg CP, respectively. Fraction C was higher in jureminha ($P < 0.05$) and lower in cunhã and gliricídia, representing the indigestible protein fraction and therefore less available for ruminal digestion. Cunhã has the potential to constitute part of the protein in diets formulated for small ruminants, optimizing animal nutrition.

Keywords: chemical-bromatological composition, Fabaceae, forage cultivation, ruminant nutrition, protein.

Financial support: CNPq, CAPES.