

## Exploratory data assessment of fecal NIRS from small ruminants: toward a global model to Brazilian Northeastern rangelands

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### Track

#### 8. Agriculture and food

The nutrition of grazing ruminants on Brazilian Northeastern rangelands (Caatinga) is challenging. The Fecal NIR spectrum shows high linearity with dietary nutrients of grazing ruminants. However, it requires a database variability wide enough to encompass all field condition. Many species from Caatinga have been identified as endemical, may acting as a link points, raising the possibility to build a global model. This work is a first approximation to evaluate the feasibility to develop a global model of fecal NIRS to small ruminants on Brazilian Caatinga. Two 12-months on-field trials were carried out in Pernambuco (08°04'25''S, 37°15'52''W) and Paraíba (07°23'30''S, 36°31'59''W) States, where fecal samples were collected during six consecutive days a month, totalizing 360 and 315 fecal samples in both location, respectively. All sample was obtained from 24 h fecal bags. Samples were dried in forced air oven to 50oC and their diffuse reflectance spectra were obtained by using a NIR Perten® DA 7500 spectrometer (Perten Instruments, Hägersten, Sweden). The measurement was repeated twice for each. Multiple Scatter Correction (MSC) was applied to correct scattering effects. Samples were classified ( $P<0.05$ ) using Soft Independent Modeling of Class Analog (SIMCA) methods by using The Unscrambler® software (Camo Inc, Oslo, Norway). First, samples do not identified as membership of their own class were assigned as outliers and removed from the data set ( $n=38$ ). The dataset of Pernambuco State (PE) recognized 57% of samples from Paraíba State (PB) as inside of its principal component(PC) space ( $P<0.05$ ), while only 49% of the Pernambuco samples fell inside of

the Paraiba class boundaries. Analyzing by season, the data showed great similarity between sites, when in the dry season for both sides, Pernambuco recognized as a Paraiba membership (PE/PB, 76.75%) and Paraiba samples falling into Pernambuco PC space (PB/PE, 80.68%). During the transition season rainy/dry season the similarity was high (PE/PB 41.38, PB/PE 100.00%), reducing in the transition dry/rainy season (PE/PB 71.43%, PB/PE 52.54%). The greater dissimilarity was observed during the rainy season (PE/PB 17.91%, PB/PE 39.23%). The wide botanical diversity in PE state (26 families and 65 species), compared to PB state (12 families e 27 species), and the occurrence of ten common families between sites, may be reason of the PB variation had been recognized as PE class membership. The most of the common species are from shrubs and trees, predominant in the dry season, which explain the greater similarity during that season. During the transition season, mainly dry/rainy and rainy season, the high frequency of growing ephemeral grasses, probably was the variable that increased the dissimilarity of the data set. In conclusion, fecal NIR global model from Brazilian rangelands seems be potentially feasible, depending on how wide is the botanical composition of the area and when the samples are obtained, representing this last point the challenge toward a global model.

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