



Tropentag, September 17-19, 2014, Prague, Czech Republic

“Bridging the gap between increasing knowledge and decreasing resources”

Early Stage Identification of Rumen Microorganisms from Selected Nigerian Breeds of Cattle

O. I. ADEYOSOYE¹, A. K. AKINTOKUN², OLANIKE ABIOLA-OLAGUNJU³, K. D. AFOLABI⁴, ELIZABETH OMOKOSHI JOEL⁵

¹*Obafemi Awolowo University, Dept. of Animal Sciences, Nigeria*

²*Federal University of Agriculture, Abeokuta, Dept. of Microbiology, Nigeria*

³*Olabisi Onabanjo University, Ayetoro Campus, Dept. of Home and Hotel Management, Nigeria*

⁴*Rubber Research Institute of Nigeria, Research Outreach, Nigeria*

⁵*University of Ibadan, Dept. of Animal Science, Nigeria*

Abstract

The kinetics of fermentative activities in the rumen justified the need for microbial assessment of members of rumen community during early stage of fermentation in selected breeds of cattle commonly raised or found in Nigeria. A total of four breeds of cattle was selected for this study comprising of both male and female species of Bunaji (White Fulani), Futumi (Keteku), Bokolo (N'dama) and Djeli (Sokoto Gudali). Total heterophilic bacteria (THB) on nutrient agar ranged between 9.1×10^8 cfu g⁻¹ - 125×10^{11} cfu g⁻¹ with the highest count recorded for male Djeli (Dm) and the least count for female Djeli (Df), respectively. Total heterophilic fungi (THF) on malt extract agar recorded the highest count (6.0×10^5 spores g⁻¹) for female Bunaji (Bf) and no growth was observed for female Bokolo (Bkf). The rumen pH ranged between 5.65 and 6.90 for female Futumi (Ff) and male Bunaji (Bm), respectively. Significant difference ($p < 0.05$) was observed for pH and total microbial counts based on sex. Standard methods of colonial and biochemical assessments led to the isolation, characterisation and identification of bacterial species of the genera: *Klebsiella*, *Proteus*, *Pseudomonas* and *Shigella*. *Klebsiella edwardsii* had the highest occurrence (24.24%). *Proteus morganella*, *Shigella dysenteriae* and *Shigella sonnei* occurred least (3.03%). Fungal species of the group: *Aspergillus*, *Botrytis*, *Cladosporium*, *Cephalosporium*, *Paecilomyces*, *Penicillium*, *Pullularia*, *Rhizoctonia* and *Trichophyton* were also isolated and identified. *Aspergillus glaucus* and *Pullularia pullulans* both had the highest occurrence (17%) while *A. fumigatus*, *A. niger*, *Botrytis* spp., *Cladosporium herbarium*, *Penicillium camemberti*, *Trichophyton mentagrophytes*, *T. rubrum* and *Rhizoctonia solani* occurred least at the level of 5%. In conclusion, breed as a factor was found to have significant effects on the percentage occurrence, type and total load of rumen bacteria and fungi at the early stage of fermentation. The use of fistulated animals is recommended for microbial screening at different stages of fermentation without the need to sacrifice the animals.

Keywords: Conventional methods, fermentation, Nigerian cattle breeds,