



Tropentag, October 7-9, 2008, Hohenheim

“Competition for Resources in a Changing World:
New Drive for Rural Development”

Moringa oleifera* Seed Fractions and the Inhibition of Proteolytic Activity *in vitro

BLASIUS NCHE AZUHNWI, ELLEN HOFFMANN, KLAUS BECKER

University of Hohenheim, Institute of Animal Production in the Tropics and Subtropics, Germany

Abstract

The seed of *Moringa oleifera* Lam, a multipurpose tropical tree, is believed to harbour potential to overcome the excessive breakdown of proteins in the rumen for a ‘protein sparing effect’ of the seed extract was reported *in vitro*. To avoid laborious processing and associated yield losses during extraction, this study aimed at characterising the whole *Moringa* seed and its various fractions for example: kernel, defatted kernel, defatted seed and shell, with respect to rumen proteolysis *in vitro*, on a standard substrate background representing a concentrate rich diet. The bioactivity of seed fractions, included at 18 % (w/w), was investigated in 12 h batch incubation, with regular sampling and determination of general parameters (gas production and SCFA yield) and protein specific parameters (iso-SCFA, soluble protein concentration, protein degradation rates and ammonium). While all tested fractions had some impact on fermentation parameters; the defatted kernel stood out as fraction with highest efficacy. It significantly ($p < 0.001$) reduced iso-SCFA yields to 45 % and ammonium ($p < 0.05$) to 80 % compared to control. Soluble protein concentration at 12 h were significantly ($p < 0.001$) increased to 325 % while protein degradation rates were significantly ($p < 0.001$) reduced to 20 % compared to control. The effects produced by defatted kernel were similar to those obtained from monensin, a feedlot antibiotic used in this study as a positive control. When dosages of other *Moringa* seed fractions were increased to obtain equivalent amounts to 18 % (w/w) inclusion of defatted kernel, similar effects to defatted kernel were obtained for rumen fermentation parameters. These results suggest that *Moringa* seed fractions when included in *vivo* diets could improve nitrogen utilisation, decrease the input cost by sparing protein in the diet thereby enhancing animal productivity. As a potential alternative to antibiotic feed additives previously applied in intensive livestock production systems; the tropical *Moringa* plant could become an export item from developing countries in future.

Keywords: *Moringa* seed fractions, proteolysis, rumen fermentation