Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Particle Size Distribution Is an Indication of Wheat Bran Quality Attributes for Dairy Farmers in Tigray Region, Northern Ethiopia

Alemayehu Tadesse[1,3], Yayneshet Tesfay[2], Veerle Fievez[3]

[1] *Mekelle University, Animal, Rangeland and Wildlife Sciences, Ethiopia*
[2] *International Livestock Research Institute (ILRI), Ethiopia*
[3] *Ghent University, Animal Sciences and Aquatic Ecology (Lanupro), Belgium*

Abstract

This study was conducted to evaluate the relationship between farmers' preference and laboratory analysis for assessment of wheat bran quality parameters. A total of 30 smallholder dairy farmers were involved in the study. Five types of wheat bran were collected from five major wheat flour processing factories found in Tigray region (Ethiopia). Farmers scored the studied wheat bran types on a scale of 1 (not preferred) to 4 (highly preferred) for quality attributes including water holding capacity (WHC), swelling capacity (SC) and nutritive value. The laboratory analysis of wheat bran samples were conducted for physical parameters [geometric median particle size (D50), WHC, SC, water retention capacity (WRC) and bulk density (BD)], proximate and fibre components and *in vitro* digestibility. A difference ($p < 0.05$) in D50, WHC, SC, WRC and BD among the studied wheat bran types was ensured. Ranges of the monitored physical, chemical and digestibility parameters are given between brackets: D50 (909–1103 μm), WHC (2.14–2.90 g g^{-1}), crude protein (CP) (133–163 g kg^{-1} DM), ash free neutral detergent fibre (347–476 g kg^{-1} DM), non fibre carbohydrates (265–436 g kg^{-1} DM), effective rumen dry matter degradability (0.568–0.712 g g^{-1} DM) and effective rumen protein degradability (ERPD) (0.730–0.793 g g^{-1} DM). Farmers particularly relied on particle size distribution to make their appreciation and highly scored wheat bran types with coarse particle size for the quality attributes of WHC and SC, while, the wheat bran types with fine particle size distribution were generally better scored for their nutritive value. Farmers' scores for nutritive value of wheat bran were positively correlated with CP (r = 0.347; $p < 0.05$) and ERPD (r = 0.291; $p < 0.05$), whereas, there was a negative association with particle size (r = -0.553; $p < 0.05$). Farmers' scores for water holding capacity of wheat bran were positively correlated with particle size (r = 0.526; $p < 0.05$). Overall, the present findings revealed that particle size distribution is the predominant qualitative selection criteria for farmers to assess wheat bran quality (e.g. on the market) and this qualitative appreciation is to some extent related to chemical characteristics and rumen degradability.

Keywords: Nutritive value, particle size, water holding capacity, wheat bran

Contact Address: Alemayehu Tadesse, Mekelle University, Animal, Rangeland and Wildlife Sciences, Mekelle University Endayesus Campus, 231 Mekelle, Ethiopia, e-mail: alextmu@yahoo.com