Tropentag, October 5-7, 2011, Bonn

"Development on the margin"

Effect of Supplementation with Agro-industrial By-products on Mineral Content in Awassi Sheep Milk

Muhi El-Dine Hilali[1], Luis lñiguez[1], Barbara Rischkowsky[1], Helmut Mayer[2], Matthias Schreiner[2]

[1] *International Centre for Agricultural Research in the Dry Areas (ICARDA), Syria*
[2] *University of Natural Resources and Life Sciences (BOKU), Department of Food Sciences and Technology, Austria*

Abstract

Resource-poor dairy sheep farmers in Middle Eastern countries face high feeding costs in particular during the milk production period. The conventional supplementary feeds used by farmers (control) are based on barley, wheat bran and barley straw and are often unbalanced in energy and protein contents. It has already been demonstrated that locally available feeds like cotton seed cake (CSC), molasses, sugar beet pulp (SBP) and urea-treated wheat straw (UTS) can be utilised to design balanced cost-optimised diets (COD). However, the changed feeding regimes may affect mineral content. This paper examines the effects of CODs on the Awassi sheep milk content of calcium, phosphorus, sodium, potassium and magnesium that play an important role in human bone health.

Five CODs were compared with a control diet at the International Center for Agricultural Research in the Dry Areas, Aleppo, Syria. Forty-eight Awassi ewes were randomly assigned to the six groups. Animals in all COD treatments were kept on grazing as a basal diet, supplemented with the same level of crude protein ($229\,g\,d^{-1}$ and energy ($18\,MJ\,d^{-1}$). The control group received less protein ($190\,g\,d^{-1}$) and similar energy levels as the COD groups. Milk samples were collected once every two weeks from April to July.

Diet affected significantly the milk content of minerals. In two out of five CODs, the milk content of calcium was increased by 5-6% compared to the control diet. The CSC and UTS -CODs resulted in a decrease in the content of phosphorus by 3-5%. Also, the content of magnesium decreased by 3-7% in three CODs compared to the control diet. The potassium increased by 7% in one COD, while the content of sodium decreased by 8-12% in three CODs. The mineral content changed by the advance of milking season. The content of calcium and potassium was decreased with the advance of lactation while the content of phosphorus, magnesium and sodium increased with the advance of lactation.

Diets can affect the content of minerals in milk which can make an important contribution to the human daily intake, especially calcium that has a benefit on osteoporosis and on traits of the metabolic syndrome.

Keywords: Agro-industrial by-products, Awassi sheep milk, minerals

Contact Address: Muhi El-Dine Hilali, International Center for Agricultural Research in the Dry Areas (ICARDA), Diversification and Sustainable Intensification of Production Systems, Aleppo, Syria, e-mail: m.hilali@cgiar.org