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Effect of Diet Type on Milk Yield and Composition of Local and Exotic Cattle Breeds Kept in the Coastal Region of Peru

KARIN BARTL¹, MIRIAM GARCIA², CARLOS A. GOMEZ², HANS-RUDOLF WETTSTEIN¹, MICHAEL KREUZER¹, HANS-DIETER HESS³

¹*ETH Zurich, Institute of Animal Science, Switzerland*

²*Universidad Nacional Agraria La Molina, Peru*

³*Agroscope Liebefeld-Posieux, Swiss Federal Research Station for Animal Production and Dairy Products (ALP), Switzerland*

Abstract

The dominant cattle genotypes used by smallholder farmers in the Central Peruvian Andes are the local “Criollo” and Criollo x Brown-Swiss (BS) crossbreds, with an often dominating proportion of BS genes. The response of the two genotypes to three diets with contrasting quality on milk yield and composition was determined in six Criollo and six (almost purebred) BS cows kept in the Peruvian coastal lowlands. Diets represented the quality of typical highland dry-season forage (D), typical highland rainy-season forage (R) and a diet optimised to meet the cows’ requirements (O). The diets consisted of different roughages which contained, per kg of dry matter (DM) 40, 76 and 133 g of crude protein, 716, 680 and 519 g of fibre (NDF), and 4.0, 5.4 and 4.8 MJ of net energy lactation (NEL), respectively. Only diet O was complemented with a fixed amount of concentrate. The cows received the roughages ad libitum in a changeover arrangement. The mean yields of energy-corrected milk (ECM, kg/head/day) with diets D, R and O were 1.99, 4.05 and 4.66 for the Criollo and 4.02, 7.01 and 8.77 for the BS cows (effects of breed and diet type; $p < 0.001$). Fat content was not affected by diet type and was lower in the milk of BS (4.63 %) than in the milk of Criollo (5.01 %) cows. In contrast, content of protein was affected by diet quality but not by breed, whereas lactose content was affected by diet quality and by breed. In general, BS cows presented higher absolute increases in ECM production due to improved nutrition than Criollo cows, particularly when switching to diet O (increases of 4.44 and 2.32 kg for BS and Criollo, respectively). However, the relative responses to the different diets were comparable among breeds. This indicates that Peruvian Criollo cows (*Bos taurus*) have the genetic potential to respond to nutritional improvements which contrasts with observations made in a previous study with Boran cows (*Bos indicus*) in Ethiopia.

Keywords: Criollo cattle, dairy production, dry season feeding, milk composition, Peru