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Effect of Feed Diets on Milk Production and Yogurt Quality

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Abstract

Cost reducing diets (CRD) were tested on 56 Awassi ewes in Syria, at the International Center for Agricultural Research in the Dry Areas to counterbalance high and increasing feeding costs faced by farmers during the milk production period in Middle Eastern countries. Milk production and yogurt firmness produced under the traditional diet used by farmers (control) was contrasted with production under 6 CRD that included barley, ammoniated wheat straw and other unconventional locally available feedstuffs: molasses cotton seed cake, wheat bran and sugar beet pulp. Animals in all CRD treatments were kept on grazing as a basal diet, supplemented with the same level of crude protein (229 g) and energy (18MJ). Under the traditional feeding ewes received less protein (190 g/d) and similar energy levels as in the CRD. Milk production of ewes under 5 out of the 6 CRD was 48 % higher than that of control ewes. One CRD containing 34 % molasses caused a decrease in milk production. Texture profile analysis (TPA) on a set type of yogurt showed an effect of diets on hardness which reflects on yogurt firmness ($p < 0.001$), an important characteristic of yogurt pricing in the Middle East. In 4 out of 6 CRD, hardness increased from 6–23 % over the control group, whereas in two CRD diets, including the molasses-CRD, the hardness declined from 9 to 10 %. A trend to increase hardness as the milking period advances, was observed in three CRD and the control ($p < 0.05$). Organoleptic and visual characteristics affecting yogurt price (texture, smell, taste and appearance) were assessed by local dairy product middlemen in yogurt produced under all diets. The sensory data analysis using a link to a cumulative logits revealed that texture, smell and taste were positively improved by the CRD over the control. A lesser effect on appearance was observed and a decrease in this trait recorded in yogurt produced under the molasses-CRD. The proposed CRD containing the tested byproducts and urea treated wheat straw are apparently options for resource-poor small-scale farmers in the Middle Eastern region to increase their productivity and income without affecting the main quality components of yogurt.

Keywords: Feed costs, milking ewes, Syria, yogurt