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Ketosis-related Biochemical Changes in Crossbred (Tarentaise X Egyptian Baladi) Dual-Purpose Cows and its Effect on The Subsequent Fertility

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[Introduction] Crossbreeding of native cows with high producing foreign pure breeds such as Tarentaise cows is of an increasing importance in subtropical countries as these crossbreds are more adaptive to the different climatic conditions. Egyptian Baladi cows had been originally used for draft agricultural work and meat production, however, nowadays they are mainly kept for both milk and beef production. Because of higher productivity, the incidence of some metabolic disorders such as ketosis in crossbred cows is higher than that in native breeds. Up to our knowledge, no reports are available about biochemical changes due to ketosis in crossbred (Tarentaise X Egyptian Baladi) cows. The aims of this study were to evaluate such changes in order to develop better understanding and likely to predict the possible occurrence of ketosis in dual-purpose crossbred cows. **[Materials and Methods]** In this study, out of 120 examined (Tarentaise X Egyptian Baladi) crossbred cows a total of 50 were clinically classified into two groups; ketosis (n=30), and healthy control (n=20) groups based on the ketone bodies level in urine at one week before the expected calving day using Medi-Test Comb-10

Glucose/Ketone kits, where the level of ketone bodies was distinguished as; none (–), traces (+/–), positive (+) and strongly positive (++/+++). In addition, ketosis group cows developed signs of reduced appetite, decrease in milk production, and acetone odor on breath. Automatic milking was used for the used cows after short-term calf removal after 72 hours. The concentrations of glucose, cholesterol, triglycerides, NEFA, calcium, phosphorus, sodium, potassium, albumin, total proteins, and urea were detected in blood at 1-week prepartum, partum "calving day", 1-week and 2-weeks postpartum. To evaluate the cows' fertility, both the days to first estrus (mean ±SEM) and the number of services per conception (mean ±SEM) were evaluated in both groups. **[Results]** The ketosis group showed significantly low glucose, low cholesterol, high NEFA, and low calcium levels in all time points in comparison to control group ($P<0.05$). Plasma glucose, serum triglycerides, and calcium levels significantly decreased in partum and postpartum time-points compared to those in prepartum time point in both groups. There were either no or slight changes in the levels of other investigated parameters throughout the sampling period. However, the mean serum NEFA level (mEq/L) showed significant increase ($P<0.05$) among all time points with a value of more than 5 times in 2-weeks postpartum in comparison to 1-week prepartum only in ketosis cows with values of 3.22 ±0.13 and 0.63 ±0.03, respectively. Moreover, ketosis negatively affected the reproductive performance where ketosis group showed significant increase ($P<0.05$) in the days to first estrus (mean ±SEM) from 37.95± 1.16 to 79.00± 2.20, and significant increase ($P<0.05$) in the number of services per conception (mean ±SEM) from 1.2 ±0.09 to 1.8 ±0.09. **In conclusion,** ketosis negatively affected the reproductive performance of dual-purpose crossbred cows. Moreover, both low plasma glucose level and high serum NEFA levels were the most prominent biochemical changes in crossbred cows with ketosis. It is recommended that crossbred cows should receive adequate amount of high quality forage during transition period to avoid ketosis and prevent the subsequent fertility disorders.

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[GO-3] Ketosis-related biochemical changes in crossbred (Tarentaise X Egyptian Baladi) dual-purpose cows and its effect on the subsequent fertility

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【 Introduction】 This study aimed to evaluate blood biochemical changes in order to develop better understanding to be able to predict the possible occurrence of ketosis in dual-purpose crossbred cows.【 Materials and Methods】 Fifty crossbred (Tarentaise X Egyptian Baladi) cows were classified into ketosis (n＝30) and control (n＝20) groups based on the ketone bodies level in urine at 1 week prepartum. Blood biochemical parameters were determined at 1-week prepartum, on day of calving, 1-week and 2-weeks postpartum. Days to first estrus (mean± SEM) and the number of services per conception were evaluated. 【 Results】 Ketosis group showed lower glucose, lower cholesterol, higher NEFA, and lower calcium levels in all time points than control group (P＜0.05). Serum NEFA level (μ Eq/L) showed an increase (P＜0.05) with a value of more than 5 times in 2-weeks postpartum in comparison to 1-week prepartum only in ketosis cows with values of 3216.3±130.0 and 632.0±33.3, respectively. Moreover, ketosis group showed an increase (P＜0.05) in the days to first estrus from 38.0±1.2 to 79.0±2.2, and an increase (P＜0.05) in the number of services per conception from 1.2±0.1 to 1.8±0.1. 【 Conclusions】 Low plasma glucose level and high serum NEFA levels were the most prominent biochemical changes and ketosis negatively affected the reproductive performance in dual-purpose crossbred cows with ketosis.
