

An aqueous *Carica papaya* Linn. extract ameliorates the expression of selected antioxidant and immune system-related genes in the milk somatic cells of dairy cows

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Abstract

This study evaluated the impact of a *Carica papaya* Linn. aqueous extract (CPAE) on the expression of selected genes related to the immune and antioxidant systems in cow milk somatic cells (MSCs) and on milk production traits. Forty dairy cows were divided into two groups (n = 20 each). The control group was injected with physiological saline, and the CPAE-treated group was injected with CPAE (250 µg/kg) weekly, beginning from one month before expected parturition until five months post-partum. Milk samples were collected on days 60, 90, 120 and 150 of lactation for the microbiological analysis and to determine the physico-chemical

composition of the milk. On day 150, blood and milk samples were used to determine the antioxidant status and isolate MSCs, respectively. Total RNA was isolated from the MSCs, and the expression levels of the β 1-defensin (GBD1), β 2-defensin (GBD2), bactenecin 7.5 (Bac7.5), bactenecin 5 (Bac5), hepcidin (HAMP), lysozyme (LZ), catalase (CAT), glutathione peroxidase (GSH-P_x) and glutathione S-transferase (GST) genes were measured via qRT-PCR using cyclophilin A (PPM) as a housekeeping gene. CPAE did not affect the milk yield or composition ($P>0.05$) but upregulate the expression of genes encoding GBD2, Bac5, Bac7.5, HAMP, LZ, CAT and GSH-P_x in MSCs ($P<0.05$). The natural microscopic organisms did not influence the levels of the transcripts. Notwithstanding, the nearness of GBD2, Bac5, Bac7.5, HAMP and LZ transcripts in drain cells got from without pathogen udders showed that these qualities were constitutively communicated. The GBD1 quality was not communicated, demonstrating that it is not constitutively communicated in drain cells and does not partake in the guard of the udder against natural microscopic organisms. These discoveries bolster the theory that GBD2, Bac5, Bac7.5, HAMP and LZ assume parts in keeping up the wellbeing of the dairy animals mammary organ. Besides, the present study affirmed the cancer prevention agent and immunostimulatory impact of CPAE and demonstrated that it may be utilized to minimize the occurrence of mastitis.