Activated CD4^{+}^ and CD8^{+}^ T Cells In Neonatal Calves Fed *Morinda Citrifolia* (Noni).

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Developmental immaturity of the immune system renders neonatal calves vulnerable to high rates of morbidity and mortality. Ingesting colostrum containing maternal immunoglobulins, leukocytes and cytokines is the calf's best defence in ensuring its health and survival. Juice made from the *Morinda citrifolia* fruit (noni) reportedly has immune enhancing effects, including anti-inflammatory and inhibition of tumorigenesis. The objective of this study was to evaluate the immune modulating effects of feeding neonatal calves noni puree by measuring lymphocyte proliferation and CD25 expression on CD4^{+}^, CD8^{+}^ and γδ T cells. Eighteen newborn Holstein bull calves were acquired in pairs from local dairies. All calves received 4.0 L of pooled colostrum by 12 h of age and were confirmed to have adequate passive transfer (1200 mg/dL IgG) at 24 h of age. The calves were divided into two groups. Group 1 comprised of control calves, while group 2 received 30 mL of noni puree twice daily in milk replacer. Day 0 samples were obtained between 36 and 48 h of age and before the first feeding of puree. Peripheral blood mononuclear cells were collected and isolated from each calf on days 0, 3, 7, and 14. To measure lymphocyte proliferation, a mitogen induced Lymphocyte Blastogenesis Test (LBT) was performed. Mitogen induced activation of CD4^{+}^, CD8^{+}^ and γδ T cells was evaluated by the up-regulation of the IL-2 receptor, CD25, on these cells with two-color flow cytometry. For both tests concanavalin A (ConA) and phytohemagglutinin were used as global mitogens. Results showed a significant increase in CD25 expression on $CD8^+$ T cells in noni puree fed calves on day 3 of the study or approximately 5 days postpartum. Similarly, CD25 expression on CD4^{+}^ T cells was also higher in noni puree fed calves on day 3. Both findings were in response to ConA stimulation, whereas the LBT did not show a significant difference between the two groups in their response to either mitogen. The precise mechanism and impact on long term health are not explained by the current study and are important areas deserving further study.