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Formic acid inactivation of Caprine Arthritis Encephalitis virus in colostrum

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Caprine Arthritis-Encephalitis Virus (CAEV) is a lentivirus which causes synovitis, arthritis and mastitis in adult goats and encephalomyelitis in kid goats. The primary route of CAEV transmission in goats is from dam to kid through ingestion of colostrum/milk containing CAEV. Traditionally, prevention of CAEV transmission for eradication protocols include removal of kids from infected dams prior to consumption of colostrum, and the administration of heat inactivated colostrum/milk or feeding colostrum replacers and segregation. However, heat inactivation of colostrum/milk can be time consuming and not available for environments without electricity or heat source. Formic Acid historically has been used in dairy calves for room temperature stabilization of milk and for its antimicrobial properties without detrimental effects on passive transfer of essential immunological components or nutritional elements of colostrum and/or milk. The objective of this study was to evaluate the utility of Formic Acid (FA) to inactivate CAEV in colostrum. Cell free colostrum was spiked with CAEV (10^5 TCID₅₀), then treated with varying amounts of formic acid (8% solution) to acidify colostrum to a pH of 3, 4, 4.5, and 5, for 15 or 30 minutes. pH was returned to 7.5 with NaOH (5N). Residual viral particles (TCID₅₀) were enumerated utilizing the virus titration assay on goat synovial membrane cells. Acidification of CAEV spiked colostrum to a pH of 3 and 4 after a 15 and 30 min resulted in a 99.99% of reduction of infectious virus particles, Acidification of spiked colostrum to a pH 4.5 and 5 did not significantly reduce the virus infectivity in compare with the non-acidified colostrum. Preliminary results demonstrate that acidification of Colostrum spiked with CAEV to a pH of 4 or less for a minimum of 15 minutes results in effective in inactivation of CAEV. Future studies include *in vivo* efficacy studies.