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## Reducing Raw Bovine Milk Spoilage through the Lactoperoxidase System in the Western Highlands of Cameroon

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### Abstract

The development of the Cameroonian dairy production got stuck, as milk production is concentrated in regions that are often far from consumers and processing plants. Large quantities of milk are lost through spoilage and poor collection systems. Moreover, refrigeration facilities are widely absent in rural dairy farms. The use of chemical methods for milk preservation such as the lactoperoxidase system (LPS) might offer a solution.

We studied the effects of the LPS on raw bovine milk in three villages in the Western Highlands of Cameroon during the rainy season. Milk collection was done 10 times, using bulk milk from 14–32 farmers. The LPS was activated by addition of 10 ppm thiocyanate and 8.5 ppm peroxide to milk, followed by thorough mixing. Part of the milk was left untreated (control). Treated and control samples were kept under three storage conditions: ambient temperature, water bath and refrigeration. Samples were monitored for spoilage at hourly intervals, except for those in the refrigerator, which were monitored six hourly. Microbial population was also estimated at intervals, using the standard plate count method.

The average increase in shelf life of treated milk with respect to the control milk was +7.1 (SD 2.4) hours under ambient temperatures, +8.1 (SD 3.0) hours in a water bath and +46.2 (SD 21.2) hours in the refrigerator. The LPS reduced microbial counts (cfu ml<sup>-1</sup>) from  $5.24 \times 10^6$  to  $1.47 \times 10^6$  after 3 hours and from  $5.12 \times 10^8$  to  $3.36 \times 10^7$  after 8 hours under ambient temperatures.

We concluded that treatment could enable the farmer sell his milk in far-off markets. Also, treated evening milk could remain in good condition for the next day's use without refrigeration. Enabling storage of milk allows the farmer to increase milk quantity by milking twice a day instead of once while not changing the transport frequency. Dosage of LPS in the field is easy, as FAO provides small-prepared quantities of the activator. Treatment alone will not be enough to develop the dairy production, but should go along with adequate improvements in cattle management.

**Keywords:** Cameroon, lactoperoxidase system, raw milk, spoilage