

**Synergistic effects of microwave heating and lactoperoxidase system on the destruction of food-borne pathogen *Salmonella enterica* Hadar and total flora of raw milk**

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Short title: **Microwave heating and destruction of *Salmonella* in raw milk.**

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## Summary

The experiments reported in this research paper aimed to study the effectiveness of a novel technology for the destruction of microorganisms in raw milk. In fact, undesirable changes can be observed in the sensory and physicochemical characteristics of the ultra-high temperature treatment of milk. Therefore, we studied a possible synergistic effect using a combination of microwave preheating (15 s, 360 W, 2.45 GHz) and the lactoperoxidase system (**LPS**) on the inactivation of total flora of raw milk and a food-borne pathogen *Salmonella enterica* Hadar (*S. enterica* Hadar).

Our results demonstrated that the combination of microwave preheating and LPS was found to be more effective than the lactoperoxidase system or microwave heating alone.

A significant difference was observed for total plate count for total flora of milk and *S. Enterica* Hadar between microwave heating, LPS and the combination of both systems.

The synergistic effects of microwave preheating and LPS treatment decreased the microbial count for total flora of raw milk to 75.60% compared to the raw milk control, and a complete inhibition of the activity of *S. enterica* Hadar. Moreover, monitoring of the synergistic impact at 4°C showed that the number of bacteria remains constant during 24 hours with the absence of *S. enterica* Hadar during the 36 hours of monitoring. The results will provide new insights to ensure the safety of dairy products by inactivating microorganisms of public health concern while preserving the quality of the product.