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Ultrasound processing of fresh and frozen semi-skimmed sheep milk and its effects on microbiological and physical-chemical quality

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The objective of this study was to evaluate the effect of ultrasound treatment on the microbiological quality, protein and free amino acid profiles of fresh and frozen stored semi-skimmed sheep milk during seven days of shelf life. Milk was treated as fresh or frozen stored before processing up to one, three and six months. Output power time and pulse time were the parameters combined to design four different ultrasound (US) treatments: power 78 W and duration 6 min (US1); power 78 W and duration 8 min (US2); power 104 W and duration 4 min (US3) power 104 W and duration 6 min (US4). Pulse duration was of 4 seconds for each treatment. Sample US1 was discarded due to non effectiveness of US treatment, while other samples showed interesting results. The fresh semi-skimmed sheep milk US4 had similar microbial contamination after processing than high temperature short time pasteurization (HTST) semi-skimmed sheep milk. Other studies evaluating the microbial inactivation of total

aerobic mesophilic bacteria by high intensity ultrasound in dairy products encountered similar results, suggesting that US technology was as effective as HTST for inactivation of microorganisms. Also, it was verified a frost effect on microorganisms in all samples which were frozen before processing. The lactic bacteria, in US4, as well as in HTST, were not detected in defrosted semi-skimmed sheep milk. Although, this group had a successful growth in US2 and US3 even in fresh and frozen period. No relevant change was reported on amino acid profile, proving that this technology could be used in milk to produce dairy products such as cheeses, maintaining the product quality. The study showed promising results: the ultrasound treatment inactivated or eliminated the studied contaminant bacteria in semi-skimmed sheep milk, while maintained acceptable amount of lactic bacteria, which could be advantageous for dairy products manufacturing.

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