41- HYGIENIC AND SANITARY REQUIREMENTS FOR RAW MILK AND PRODUCTION

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Introduction

The hygienic and sanitary quality of raw milk is crucial for the safety and technological suitability of dairy products, particularly cheeses. Implementing Good Manufacturing Practices (GMP) at the farm level and across the entire food supply chain is crucial for minimizing the risk and extent of microbiological contamination. This ensures the attainment of satisfactory hygienic standards, thereby safeguarding consumers from potential foodborne hazards linked to raw milk sheep dairy products.

Objective

This study investigating the relationships between key hygienic (Total Bacterial Count - TBC) and sanitary (Somatic Cell Count - SCC) parameters in ovine and caprine raw milk, and their consequential impact on milk's technological characteristics relevant for cheesemaking. Furthermore, this study aims to provide a detailed analysis of the food safety risks associated with small ruminant products, as well as the relevant mitigation strategies applicable throughout the dairy supply chain. Our focus is on highlighting the critical role of stringent quality controls from the farm through to final processing. We pay particular attention to the crucial role of strict quality controls, from the dairy farm to the final product.

Materials and methods

An overview of hygienic standard requirements will be presented. The analysis was based on a thorough consultation of existing literature and current legislation (Regulation EC 853/04), corroborated by two years of analytical data obtained from ovine and caprine bulk tank milk samples. The study specifically examined ovine (n=4,719 for TBC; n=9,987 for SCC) and caprine (n=518 for TBC; n=576 for SCC) milk samples. The milk coagulation properties were also evaluated in relation with the hygienic and sanitary parameters (lactodynamographic method was used as the reference method). In addition, details were shared about foodborne pathogens found in small ruminant dairy products, drawing upon epidemiological evidence from monitoring and surveillance plans, outbreak reports, and recent literature. Our research utilized predictive microbiology and risk assessment methodologies to evaluate the prevalence and survival of critical pathogens such as *Listeria monocytogenes* and Shiga-toxin producing *Escherichia coli* (STEC) throughout the entire cheese production process, from initial milking to the final product. We also examined the relevance of different critical factors affecting risk and assessed the efficacy of various proposed control measures in reducing risk using sensitivity and scenario analysis.

Results

The findings revealed a significant inverse relationship between elevated values of hygienic and sanitary parameters and the technological suitability of raw milk. High TBC values have consistently been associated with a worsening cheese-making properties, particularly with regard to the impact on coagulation time (RCT). Probabilistic risk assessments have quantified the risk for human listeriosis from raw sheep milk cheeses as extremely low at an average of $\sim 2\times10^{-14}$ per random portion for adults. In contrast, the risk of STEC infection has been estimated at an average of $\sim 4\times10^{-4}$ per random portion, representing a non-negligible risk.

Conclusion

Maintaining stringent hygienic and sanitary standards for ovine and caprine raw milk is of critical importance for ensuring both product safety and optimal technological performance in cheesemaking. High TBC and SCC milk values directly compromise milk quality, leading to adverse effects on coagulation properties and overall cheese yield. Several foodborne hazards can be associated to raw milk and dairy products from small ruminants. Among these, *Listeria monocytogenes* is often subjected to control plans, although the consumer risk for listeriosis, in type of cheese that does not support the microorganism's growth, appears significant only under specific conditions. In contrast, the risk of infection with STEC warrants careful consideration by both

farmers and manufacturers. Various measures, particularly those implemented on-farm, could be adopted to reduce the probability and magnitude of contamination, thereby limiting consumer exposure.