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Food Microbial Ecology

P1.28**Bacterial complexity of Italian Alpine butter and effect of the Malga-farm procedure on microbiota and diacetyl/acetoin accumulation****Guzzon R¹, Paolini M¹, Schiavon S¹, Mancini A¹, Roman Villega T¹, Larcher R¹, Franciosi E¹**¹Fondazione Edmund Mach, San Michele All'Adige, Italy

Bacteria can play different roles affecting flavors and food characteristics. Few studies have described the bacterial microbiota of butter. In the present paper, next-generation sequencing was used to determine bacterial diversity, together with aromatic characteristics, in raw cow milk butter processed by traditional fermentation, in fourteen small farms called "Malga", located in the Trentino province (Alpine region, North-East of Italy).

The physicochemical and aromatic characterization of traditional mountain butter (TMB) showed a low moisture level depending on the Malga producing the butter. Counts of lactic acid bacteria, Staphylococci, and coliforms, as well as diacetyl/acetoin concentrations exhibited changes according to the geographical origin of Malga and the residual humidity of butter. MiSeq Illumina data analysis revealed that the relative abundance of Lactococcus was higher in TMB samples with the highest values of acetoin (acetoin higher than 10 mg/kg).

The traditional mountain butter bacterial community was characterized by a "core dominance" of psychrotrophic genera, mainly Acinetobacter and Pseudomonas, but according to ANCOM analysis, a complex bacterial population emerged and specific bacterial genera were able to characterize the TMB bacteria community, with their high abundance, based on the Malga producing the butter.

P1.29**Survival of Listeria monocytogenes in modified fermented pepperoni formulations and process parameters****Heapes S¹, Kerry J², Duffy G¹**¹Teagasc Food Research Centre, Ashtown, Ireland, ²Food Packaging Group, School of Food & Nutritional Sciences, University College Cork, Cork, Ireland

In fermented meat such as pepperoni, the control of Listeria monocytogenes is supported by the addition of salt, sodium nitrite, acidic pH (after-fermentation), low water activity (after-drying), and often a mild heating step after fermentation. Due to consumer health considerations, there is a drive in the fermented meat sector to lower the concentrations of added salt and sodium nitrite. This may however lead to enhanced survival of L. monocytogenes in this high risk ready to eat product.

The aim of this study was to evaluate the survival of L. monocytogenes in standard and modified pepperoni formulations salt (2.5%, 1.4%), sodium nitrite (150ppm, 50ppm), and process parameters (final pH 4.8), heating (61°C, 40 min / 64°C, 20 min) and target aw (0.91/0.94) at end of drying period, with the aim of developing a healthier formulation without compromising safety.

L. monocytogenes (five strain cocktail) was inoculated (log₁₀6.00 CFU g⁻¹) into pepperoni batters of varying formulations / parameters as above. Pepperoni samples (n=3) were taken at pre-fermentation, post-fermentation, post-heating, mid-point (day 3-7), and at end-point of drying (target aw) around day 7-12. At each stage, the pepperoni were examined for weight, pH, aw, and L. monocytogenes by direct plate count (OCLA agar), and enrichment and plating.

In the standard formulation (salt, 2.5%; sodium nitrite, 150ppm; pH4.8; heat step after fermentation, 53.5°C, 61 min; and end point aw, 0.91) L. monocytogenes was reduced from a pre fermentation level of log₁₀6.14 CFU g⁻¹ to log₁₀ 1.37 CFU g⁻¹ at the drying endpoint. The inclusion of a heat step (61°C, 40 min) even with a lower salt (1.4%) and sodium nitrite (50 ppm) had a significant impact on L. monocytogenes with a > 6 log reduction from pre-fermentation (log₁₀ 6.50 CFU g⁻¹) to drying end-point, when L. monocytogenes was detectable by enrichment only. When salt in this same product was increased to 2.5% there was no detectable L. monocytogenes at the end-point. The inclusion of a higher heat step compensated for the lowering of salt levels (1.4%) and sodium nitrite (50ppm), but may impact on sensory attributes (fat appearance and colour) which would require further investigation.