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Exploring the Bacterial Communities During the Artisanal Production of Uncooked Pressed Cheese From Raw Bovine Milk

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INTRODUCTION

Microorganisms are essential in cheese-making processes, especially in artisanal raw milk uncooked pressed cheese (UPC). The bacterial ecosystems can be impacted by cheesemaking practices (1)

OBJECTIVE

Characterise the bacterial microbiota of a raw milk UPC throughout the cheese-making and ripening processes, focusing on contact surfaces

RESULTS

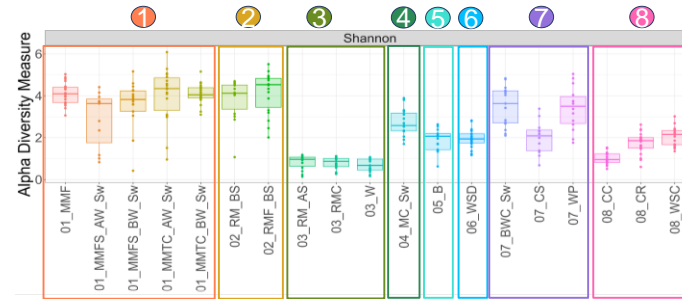


Figure 1. Alpha diversity: Shannon index for all sample types ordered along the cheesemaking continuum

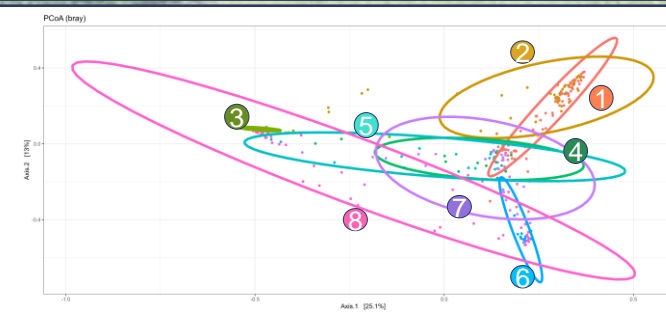


Figure 2. Beta diversity: Bray-Curtis distances among cheese-making production steps



Figure 3. Relative abundance of sequences corresponding to bacteria at genus level of every sample types at sequential processing steps along cheesemaking.

DISCUSSION and CONCLUSIONS

- Starter culture addition reduced bacterial diversity in cheese production (Fig. 1, step 3)
- Cheese washing (step 7) is a step where bacterial communities in both the upstream and downstream steps overlap (Fig. 2)
- Bacterial communities composition shifts throughout production (Fig. 3): raw milk dominated by high bacterial diversity, starter culture introduction leads to higher abundance of *Streptococcus* and *Lactobacillus* then ripening sees increased abundance of *Corynebacterium* and *Brevibacterium*. Further analyses should be done to elucidate the precise role of contact surfaces microbiota in the cheese production process.

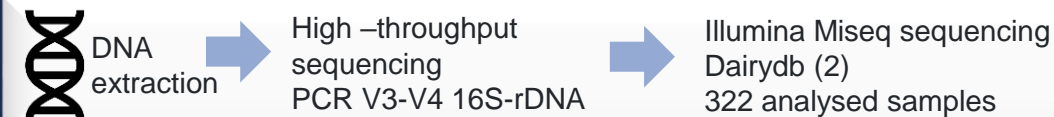
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MATERIALS AND METHODS

20 farms producing a PDO artisanal UPC sampled in summer 2023 in French mountains: 8 production steps with 16 sampling points



1) Lecadé, C., Orieux, et al., (2024). Deciphering microbial communities of three Savoyard raw milk cheeses along ripening and regarding the cheese process. *International Journal of Food Microbiology*, 418, 110712. <https://doi.org/10.1016/j.ijfoodmicro.2024.110712>

2) Meola, M., Rifa, et al., (2019). DAIRYdb: A manually curated reference database for improved taxonomy annotation of 16S rRNA gene sequences from dairy products. *BMC Genomics*, 20(1), 560. <https://doi.org/10.1186/s12864-019-5914-8>

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