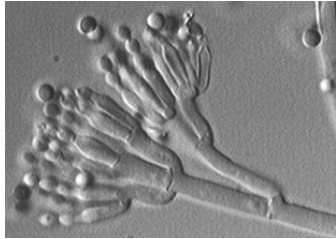


Microbiote à la surface des fromages

Arias E., Haldemann J., Sartori C., Fehér N.
 Agroscope, Liebefeld, Suisse; www.agroscope.ch

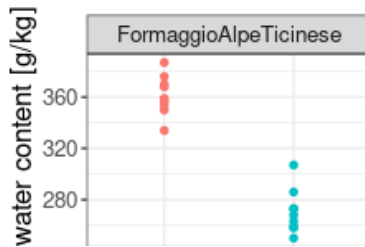
Diversité de champignons



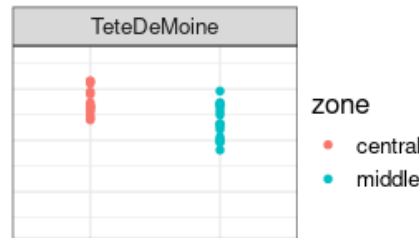
Champignons filamenteux

- *Penicillium* spp.
- *Mucor* spp.
- undescribed spp.

Cave naturelle



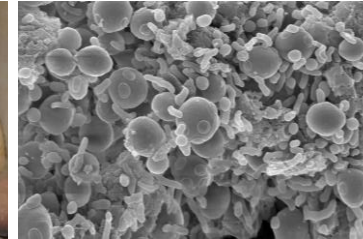
Cave humide



Soins



Diversité de bactéries



Cave sèche



Brevibacterium aurantiacum, *Brevibacterium* spp., *Agrococcus casei*, *Leucobacter* sp. métabolisent l'acide aminé méthionine en méthanthiol et en ammoniac (NH₃), puis en...

Corynebacterium spp., *Corynebacterium variabile*, *Staphylococcus equorum* métabolisent l'acide lactique en pyruvate, puis en...

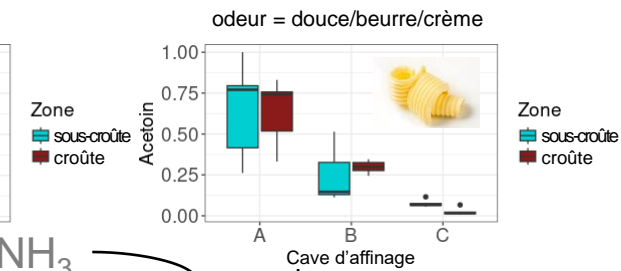
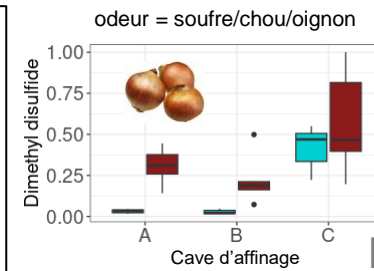
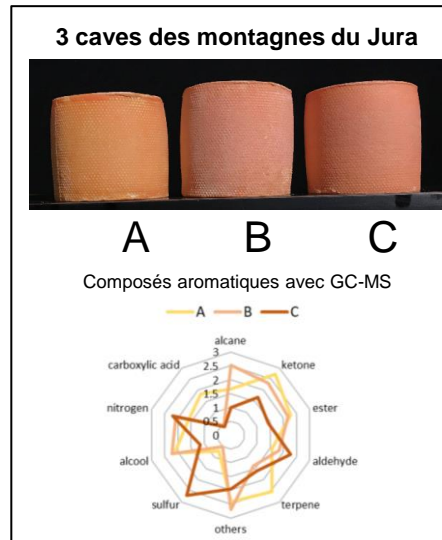
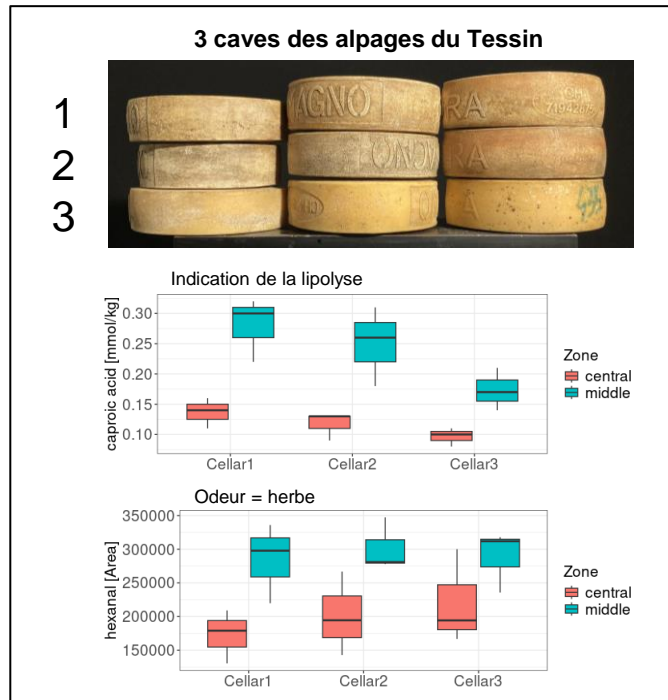
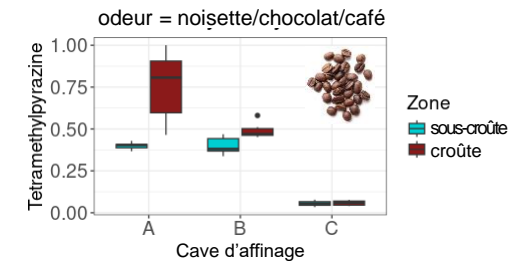
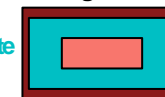


Schéma d'échantillonnage

- croûte
- zone sous-croûte
- zone centrale



Take home message

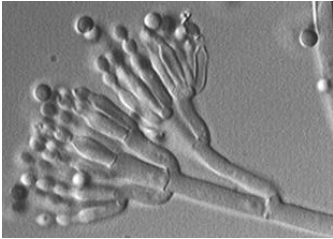
- Le climat de la cave et les soins apportés influencent les microorganismes en surface
- Ces microorganismes influencent l'arôme des fromages



Mikrobiom auf der Oberfläche von Käse

Arias E., Haldemann J., Sartori C., Fehér N.
 Agroscope, Liebefeld, Suisse; www.agroscope.ch

Vielfalt der Schimmelpilze



Naturhöhle



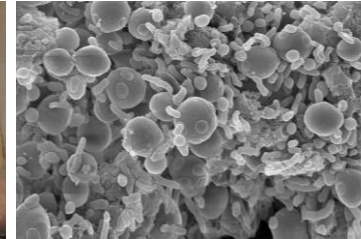
Feuchte Keller



Pflege



Diversität der Mikroorganismen

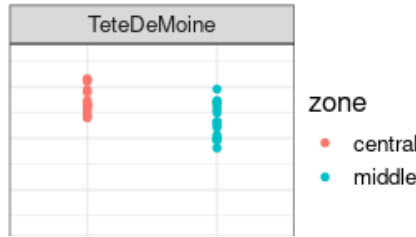
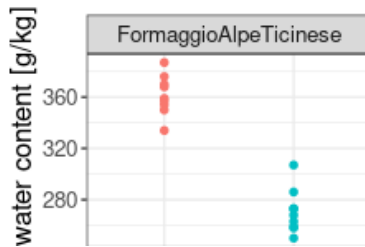


Trockene Keller



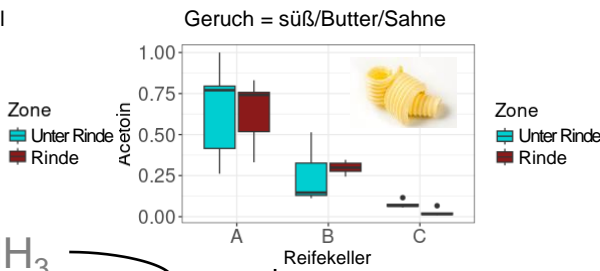
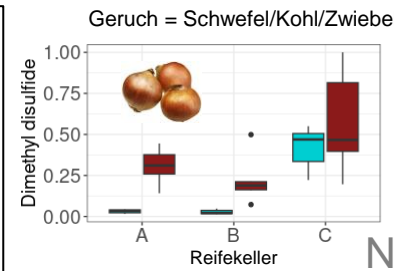
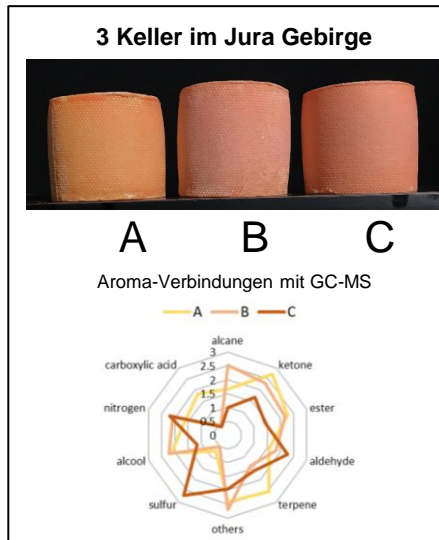
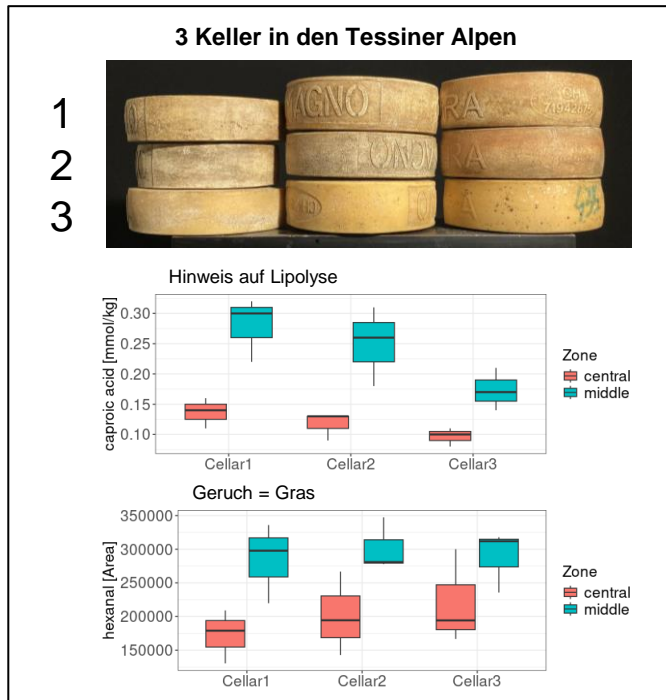
Fadenpilze

- *Penicillium* spp.
- *Mucor* spp.
- Unbeschriebene spp.



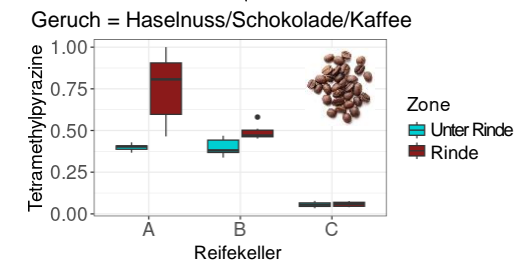
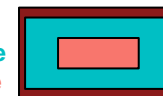
Brevibacterium aurantiacum,
Brevibacterium spp., *Agrococcus casei*,
Leucobacter sp. metabolisieren die
 Aminosäure Methionin zu Methanthiol und
 Ammoniak (NH₃) und weiter zu ...

Corynebacterium spp.,
Corynebacterium variabile,
Staphylococcus equorum,
 metabolisieren Milchsäure in
 Pyruvat und weiter in ...



Probeplan

- Rinde
- Unter der Rinde
- Zentrale Zone



Take home message

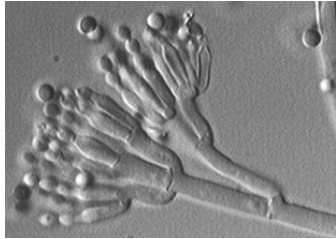
- Das Klima im Keller und die Pflege beeinflussen die Mikroorganismen auf der Oberfläche
- Diese Mikroorganismen beeinflussen das Aroma von Käse



Microorganismi sulla superficie del formaggio

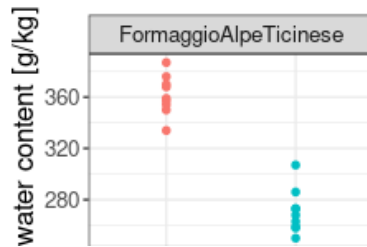
Arias E., Haldemann J., Sartori C., Fehér N.
 Agroscope, Liebefeld, Suisse; www.agroscope.ch

Diversità di funghi

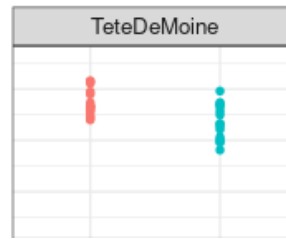


- Funghi filamentosi
- *Penicillium* spp.
 - *Mucor* spp.
 - spp. non descritte

Cantina naturale



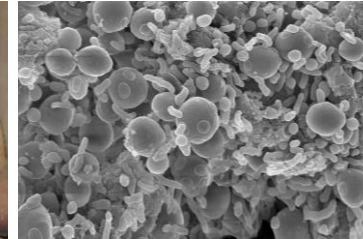
Cantina umida



Cura



Diversità di batteri

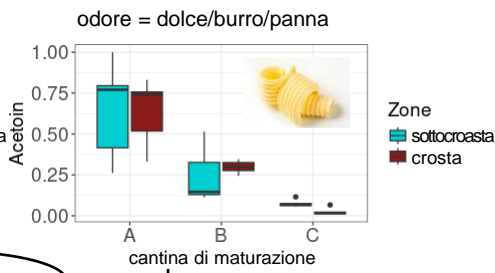
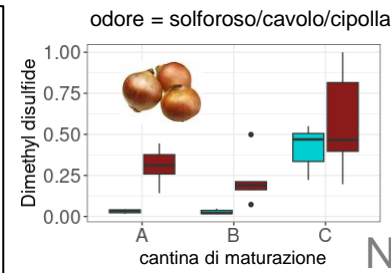
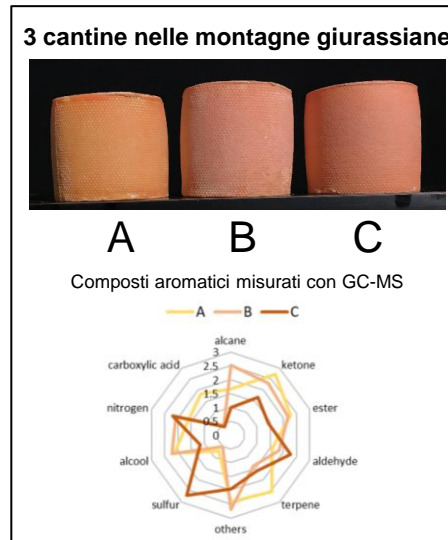
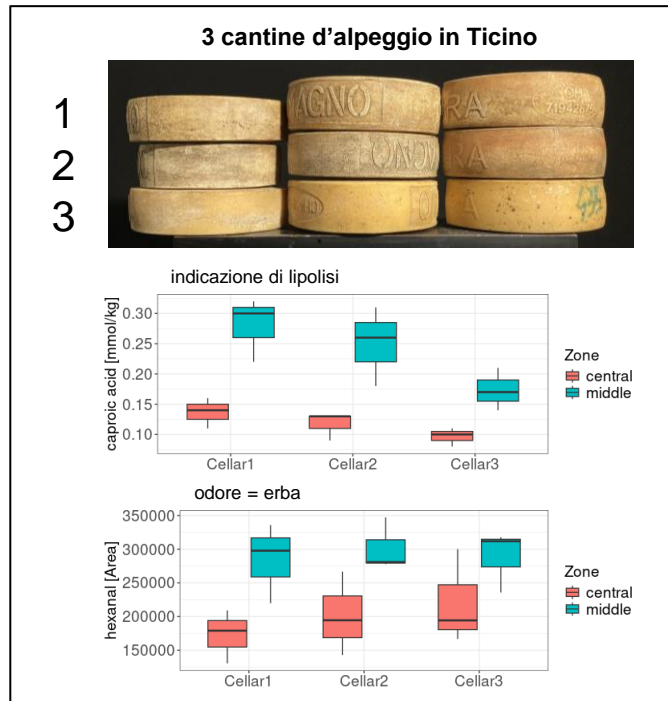


Cantina secca



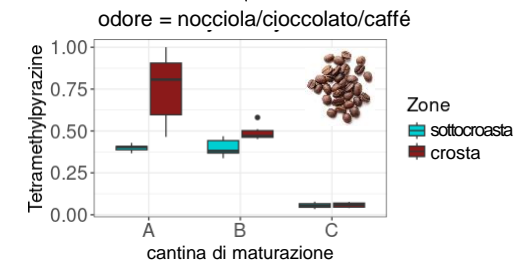
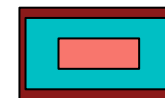
Brevibacterium aurantiacum,
Brevibacterium spp., *Agrococcus casei*,
Leucobacter sp. metabolizzano
 l'aminoacido metionina in metantiolo e
 ammoniaca (NH3) e successivamente in ...

Corynebacterium spp.,
Corynebacterium variabile, *Staphylococcus equorum* metabolizzano
 l'acido lattico in piruvato e
 successivamente in ...



Schema di campionamento

- crosta
- sottocrosta
- centro



Take home message

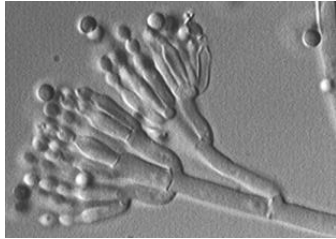
- ✓ Il clima della cantina e le cure apportate ai formaggi influenzano i microorganismi in superficie
- ✓ Questi microorganismi influenzano l'aroma dei formaggi



Microbiota on cheese surface

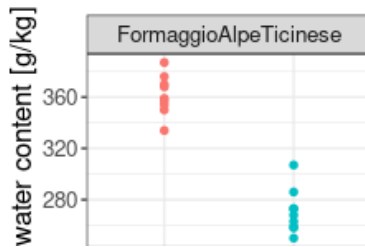
Arias E., Haldemann J., Sartori C., Fehér N.
 Agroscope, Liebefeld, Suisse; www.agroscope.ch

Diversity of fungi

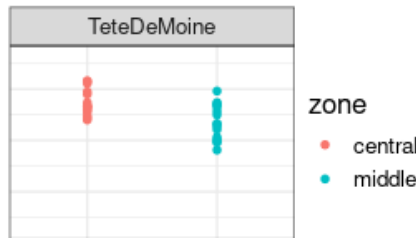


- Filamentous fungi
- *Penicillium* spp.
 - *Mucor* spp.
 - undescribed spp.

Natural cheese cellar



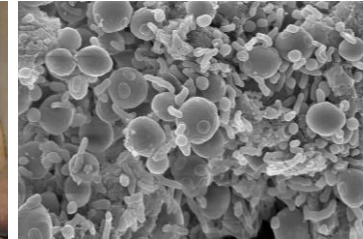
Humid cheese cellar



Cheese care



Diversity of bacteria

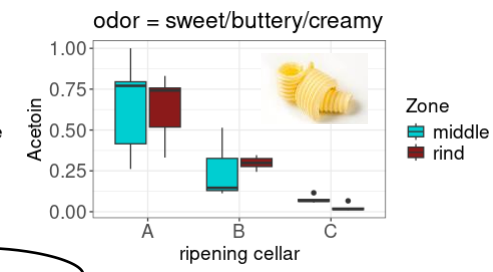
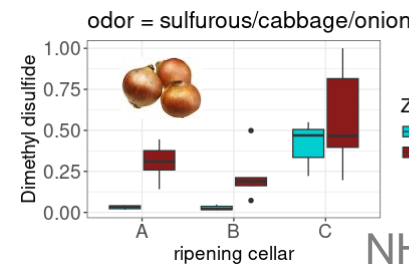
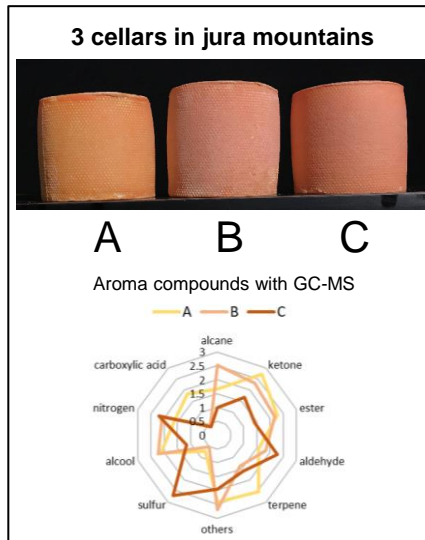
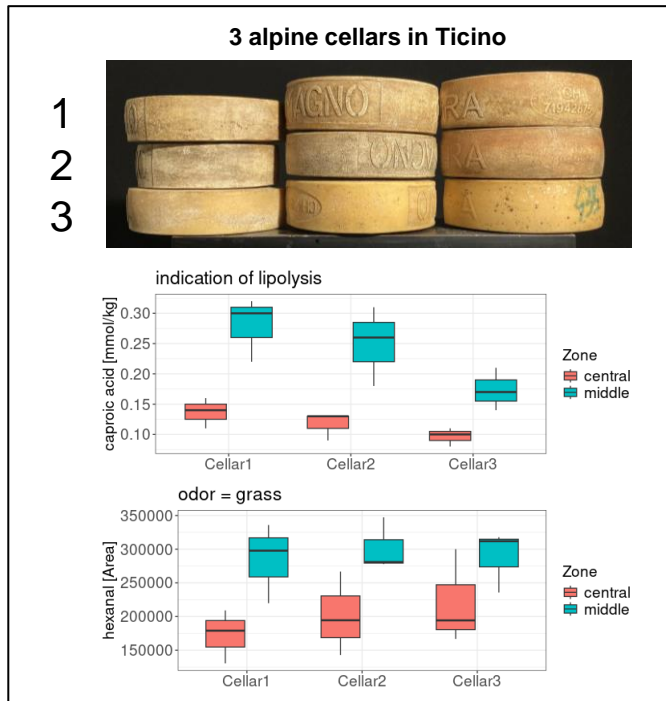


Dry cheese cellar



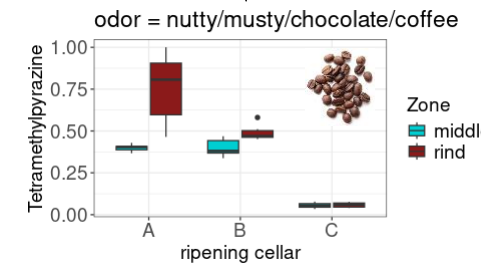
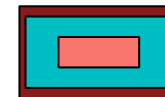
Brevibacterium aurantiacum, *Brevibacterium* spp., *Agrococcus casei*, *Leucobacter* sp. metabolise the amino acid methionine into methanliol and ammoniac (NH₃) and further into...

Corynebacterium spp., *Corynebacterium variabile*, *Staphylococcus equorum* metabolise lactic acid into pyruvate and further into...



Sampling scheme

- rind
- middle zone
- central zone



Take home message

- The climate in the cellar and the care taken influence the microorganisms on the surface.
- These microorganisms influence the flavour of the cheeses

