

**Čerstvé sýry s přídavkem protektivních kultur –  
testování potlačení růstu *Rhodotorula glutinis*  
a *Penicillium roqueforti***

***Libor Kalhotka, Jana Zemanová, Petr Kouřil, Gabriela Franke***  
***Ústav technologie potravin, AF MENDELU***

QK23020047 Ověření možností prokazování použití ochranných kultur ve výrobě potravin živočišného původu

**MeDaFish**

# Výroba sýrů

Pro výrobu sýrů bylo použito pasterované 1,5 % mléko Pilos

- 65 °C → 33 °C → kultura CHN-19 (0,1 g/4 l mléka) + ochranná kultura (0,1 g/4 l mléka) → 40 min. prokysat → 36 % CaCl<sub>2</sub> (1,6 ml/4 l mléka) + syřidlo Fromase 220 TL BF (neředěné, stanovená síla 1:5333 → dávka 1,6 ml/4 l mléka) → sýření 40 minut/33 °C,
- hranaté formy na sýr (vysvícené UV) – výtěžnost 18 ks /4 l mléka,
- odkap syrovátky + obracení → 20 hodin → 1 sýr = cca 40 g,
- inokulace modelovým kontaminantem.

## Použité kultury

### Mezofilní zákysová kultura CHN - 19

*Lactococcus lactis* subsp. *cremoris*

*Lactococcus lactis* subsp. *lactis* biovar *diacetylactis*

*Lactococcus lactis* subsp. *lactis*

*Leuconostoc mesenteroides* subsp. *cremoris*

## Protektivní kultury

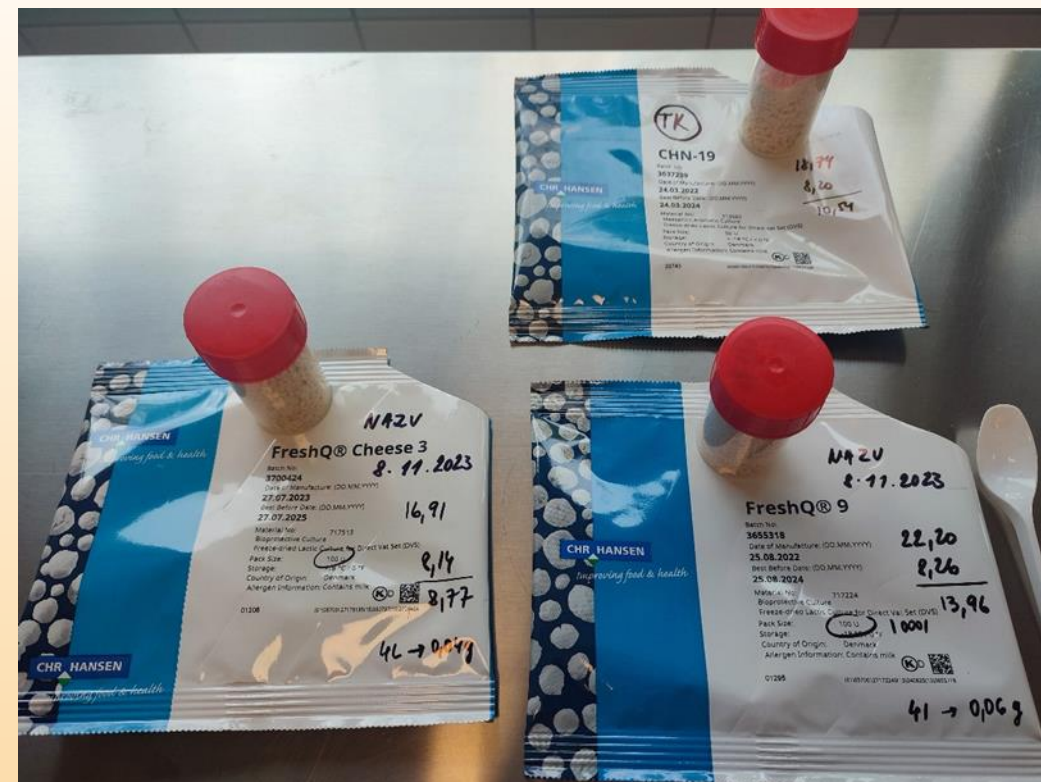
### FreshQ Cheese 3, FreshQ 9, FreshQ 11,

*Lacticaseibacillus rhamnosus* (dříve *Lactobacillus rhamnosus*)

### FreshQ 4

*Lacticaseibacillus rhamnosus*

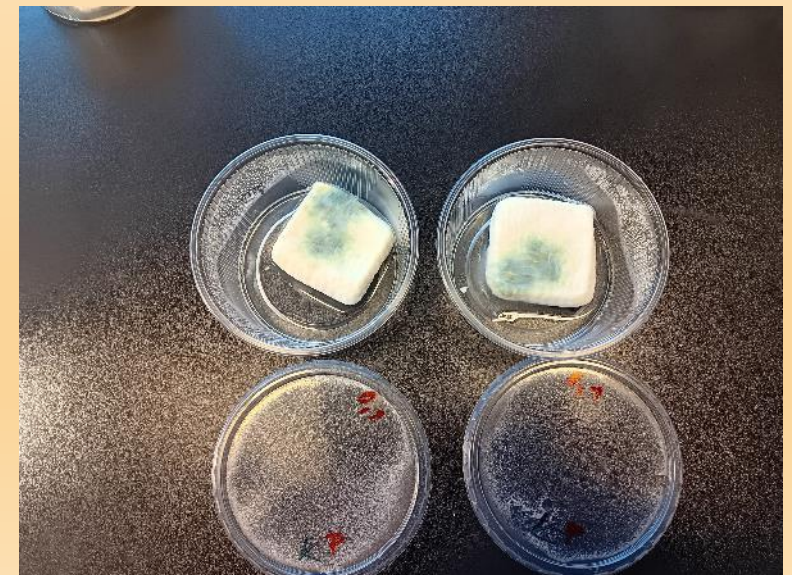
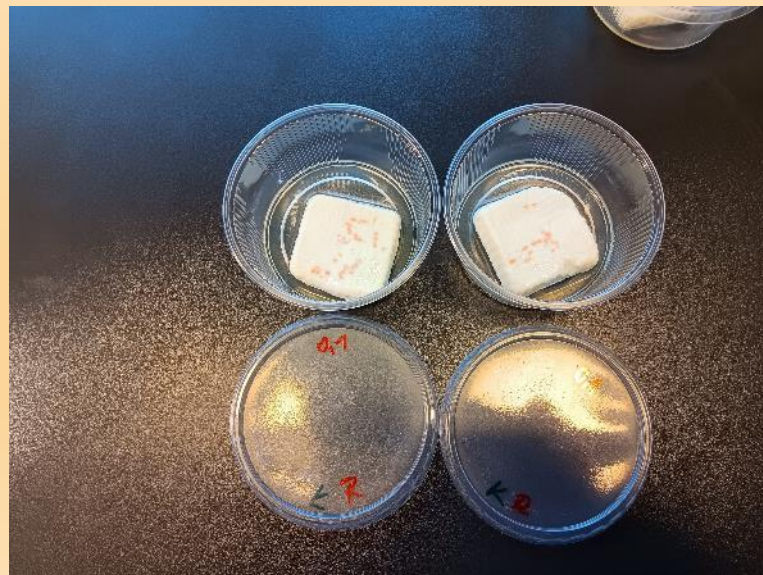
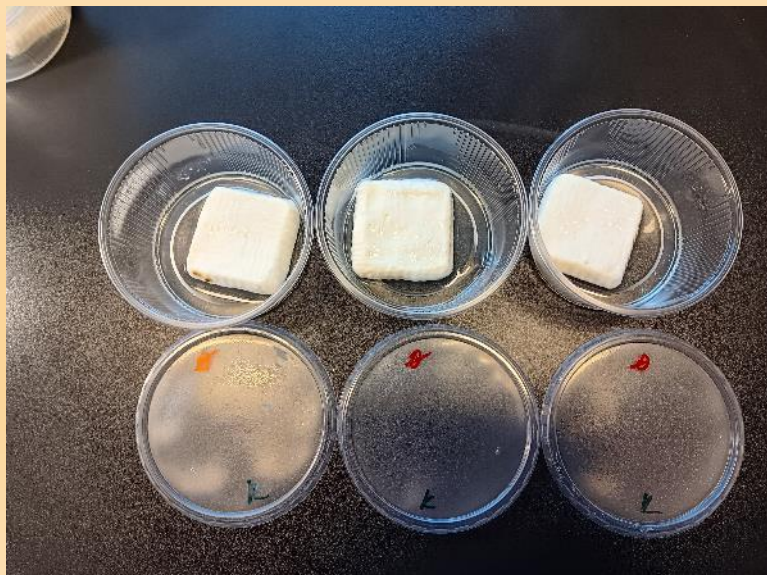
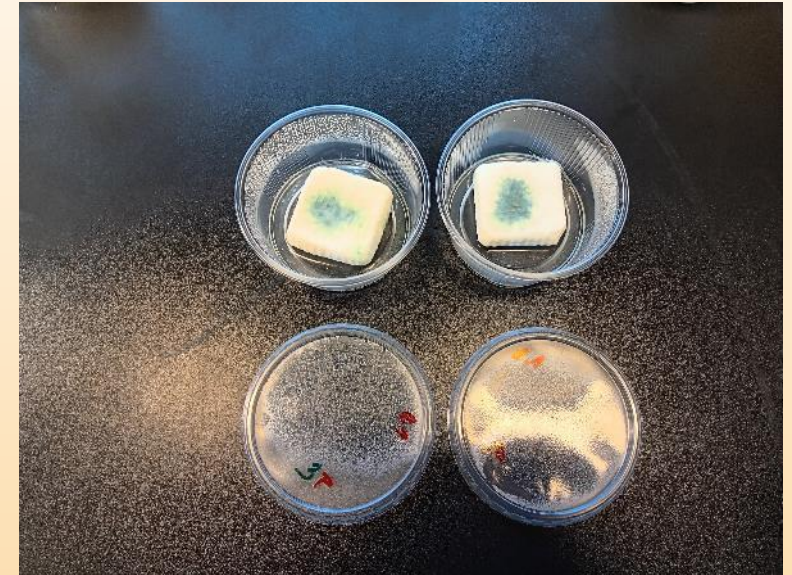
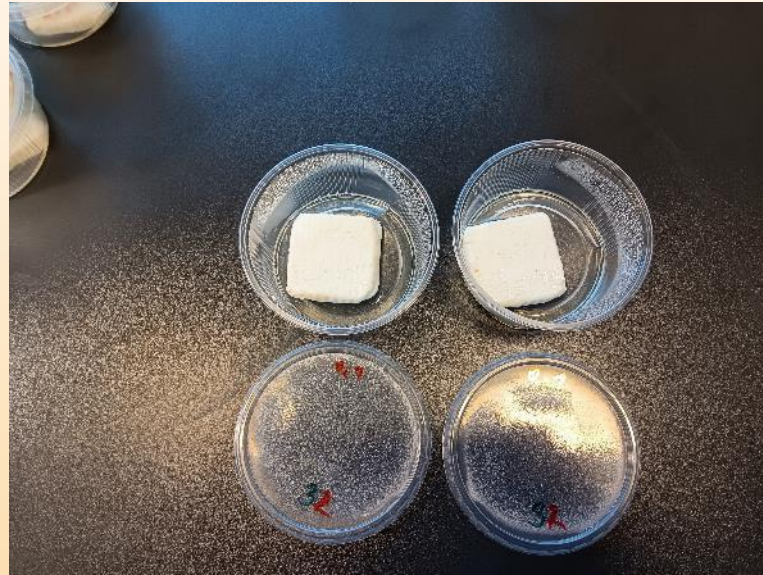
*Lacticaseibacillus paracasei* (dříve *Lactobacillus paracasei*).



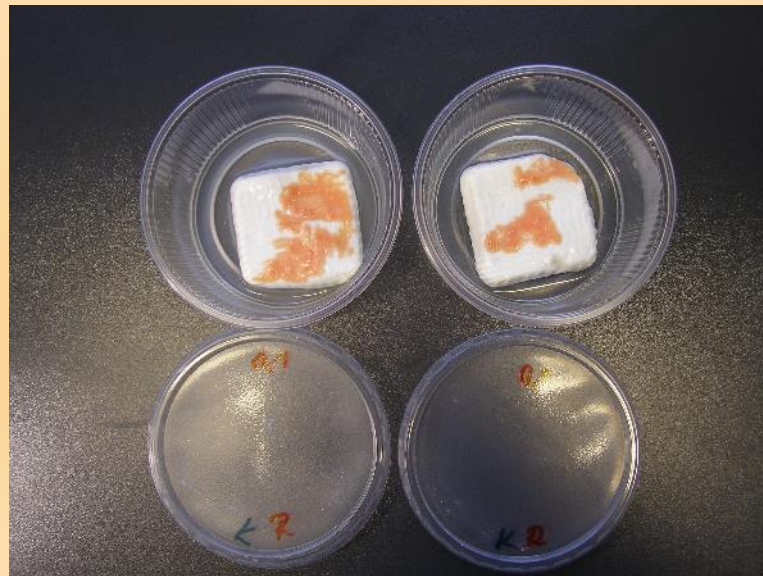
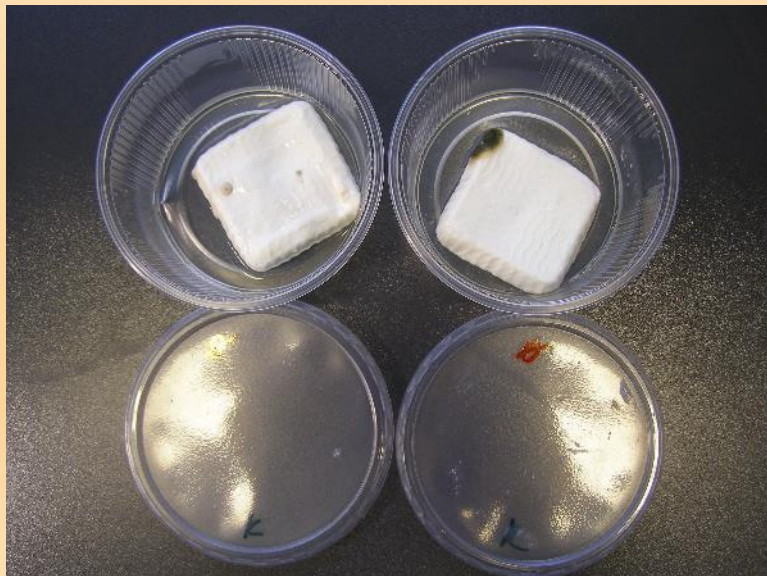
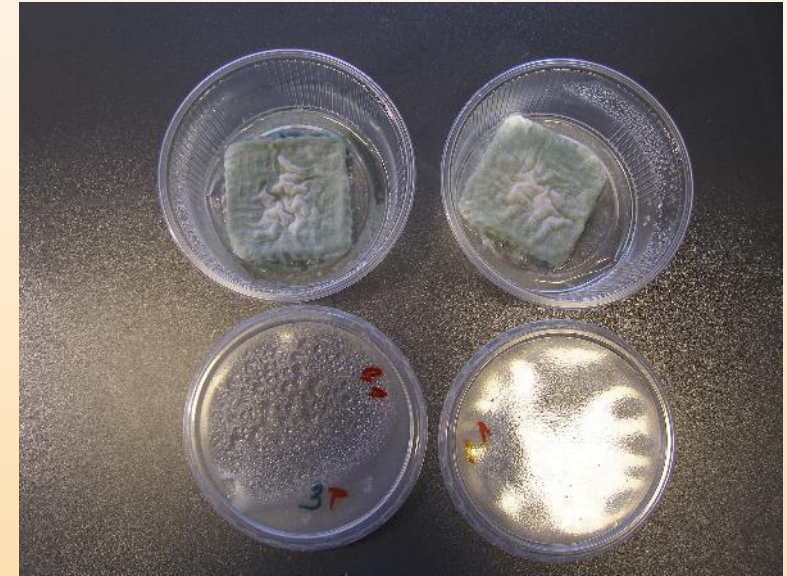
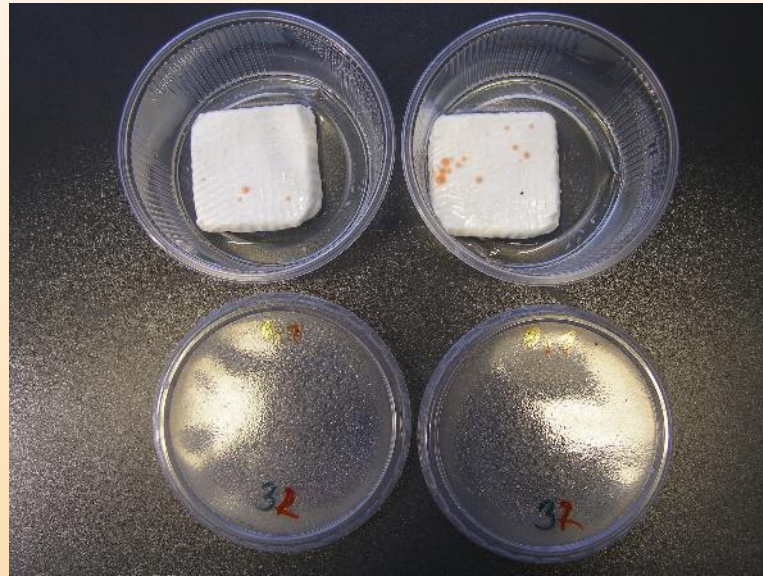
## Postup experimentu

- Od každé varianty s protektivní kulturou bylo připraveno 18 ks sýrů.
- Kontrolních sýrů bez protektivní kultury rovněž 18 ks.
- *Rhodotorula glutinis* kmen 20-1-35 a *Penicillium roqueforti* izolovaná ze sýru roquefordského typu.
- Kultura o denzitě  $10^2$ - $10^3$  buněk/ml byla aplikována v množství 10  $\mu$ l na plochu 1 cm<sup>2</sup>.
- Balení jednotlivě do plastových krabiček.
- Skladování ve zracím boxu s teplotou 8 °C po dobu 21 dní.

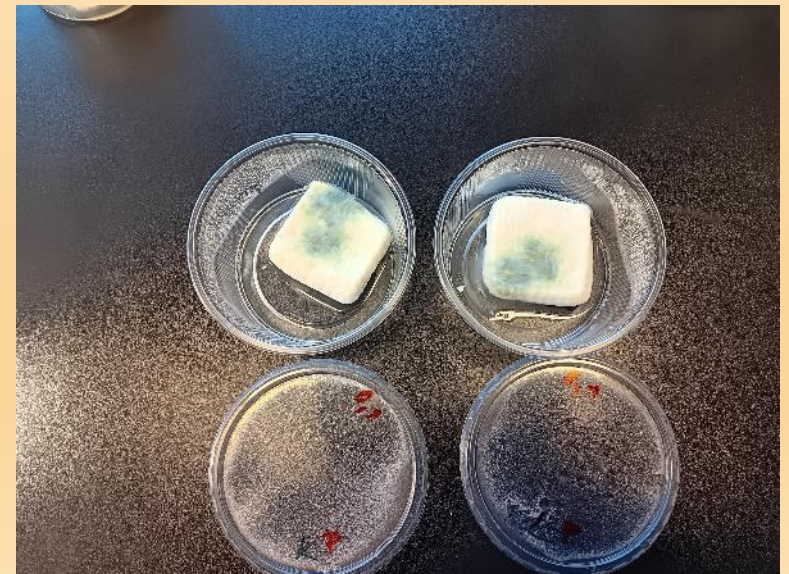
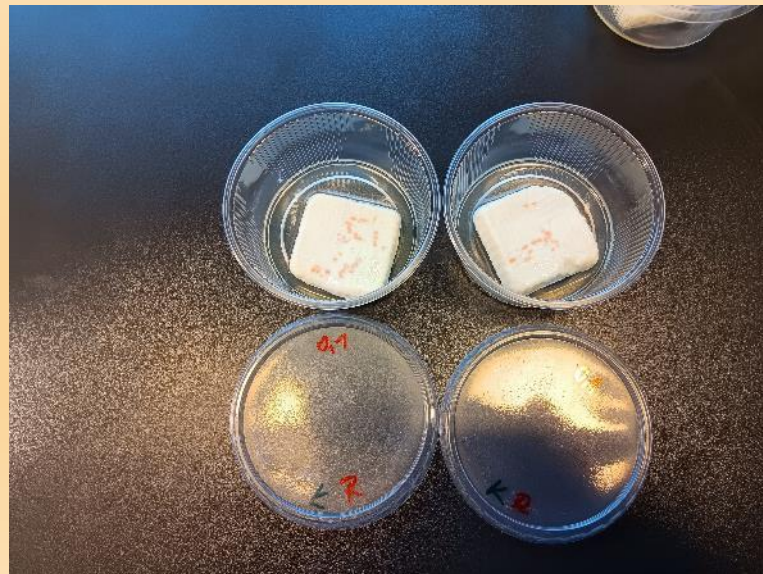
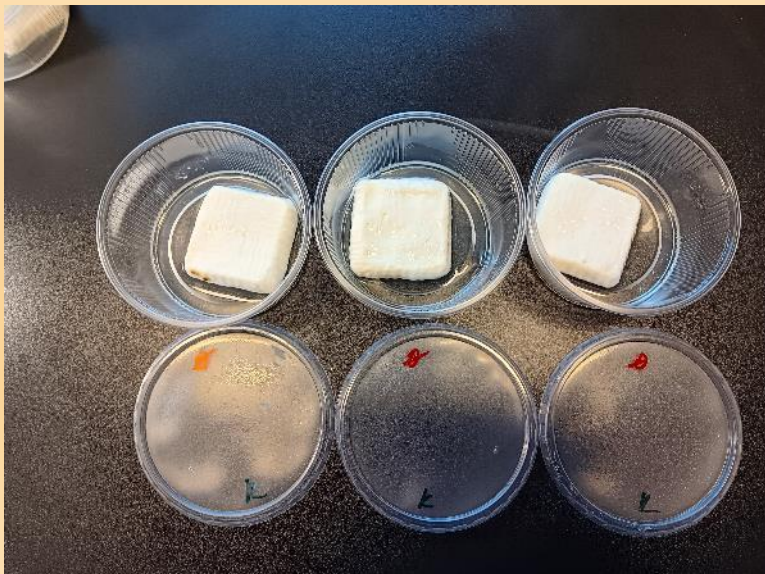
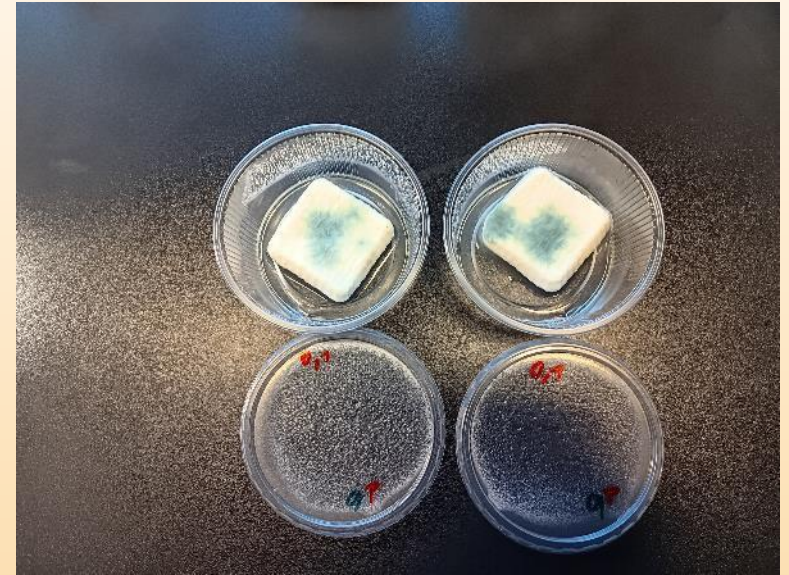
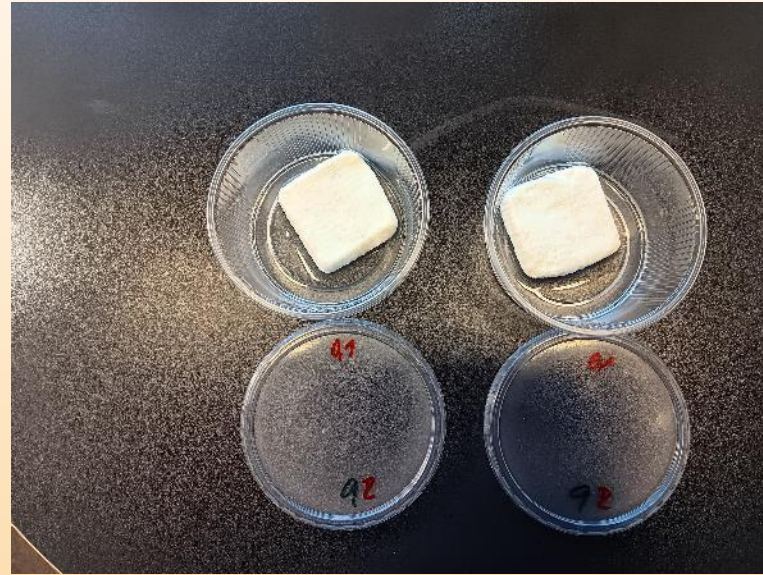
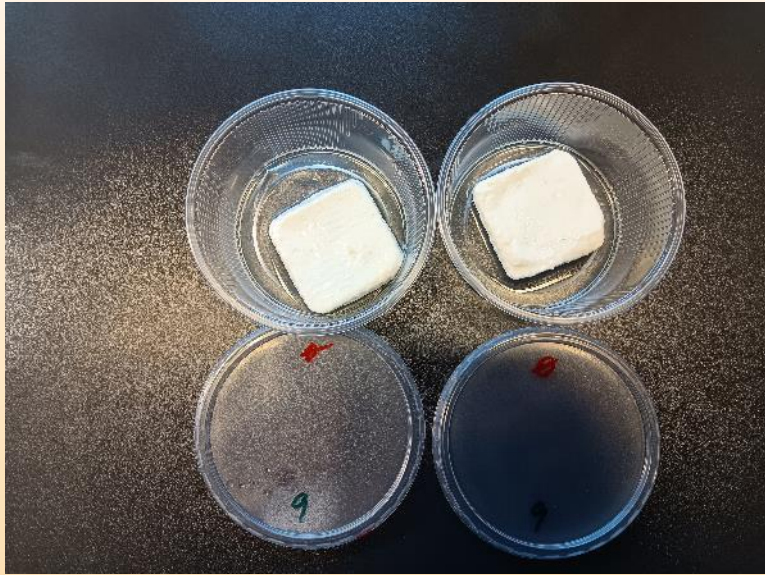
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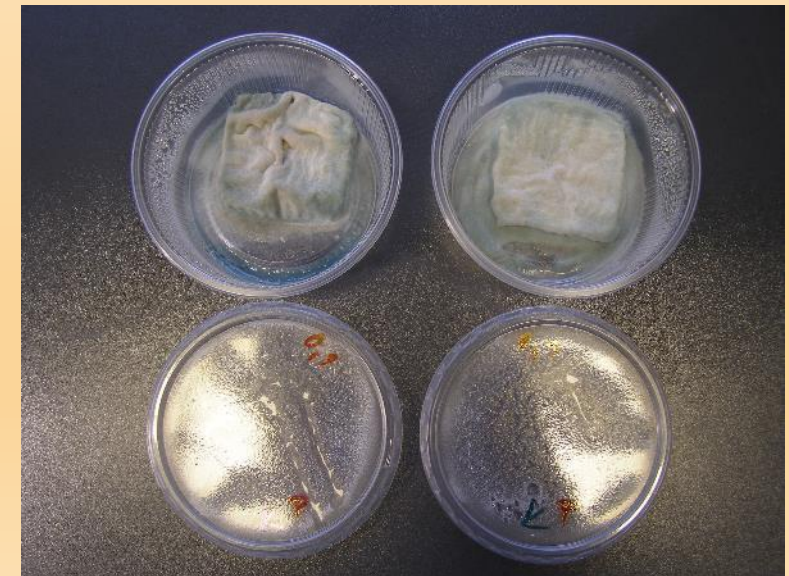
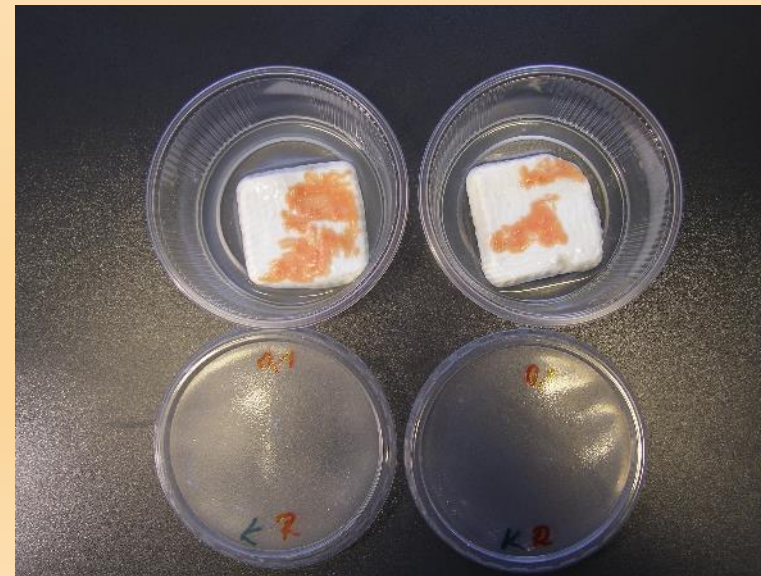
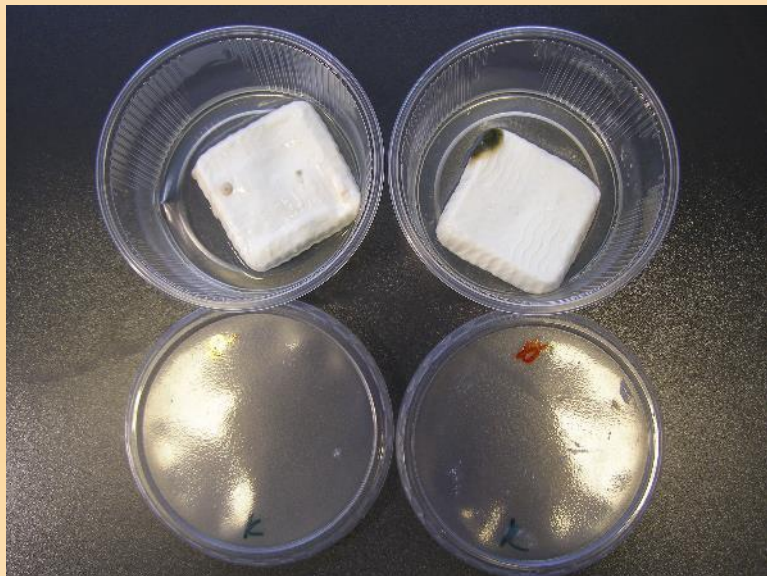
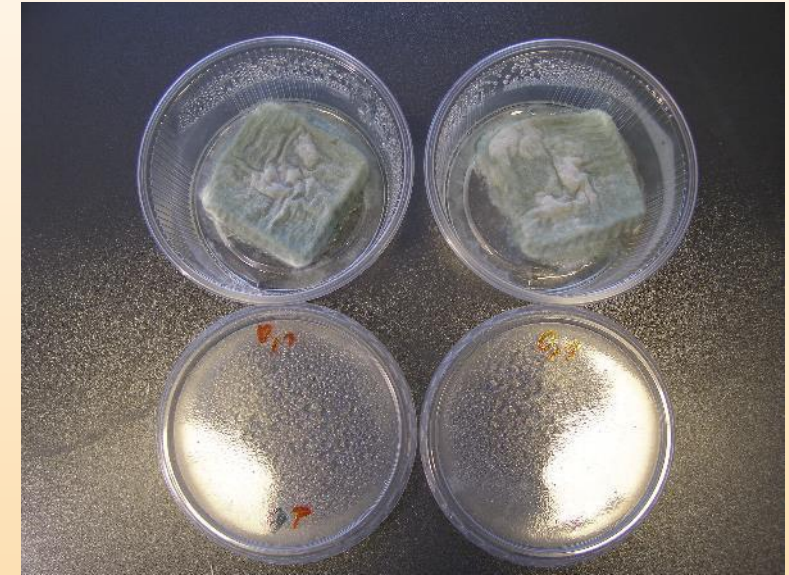
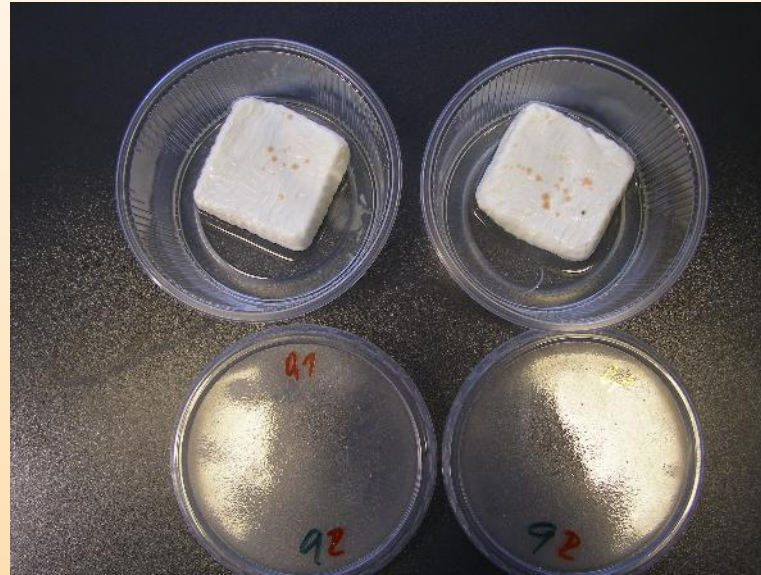
# Kultura FreshQ Cheese 3 (21. den - konec experimentu)



# Kultura FreshQ 9 (14. den)

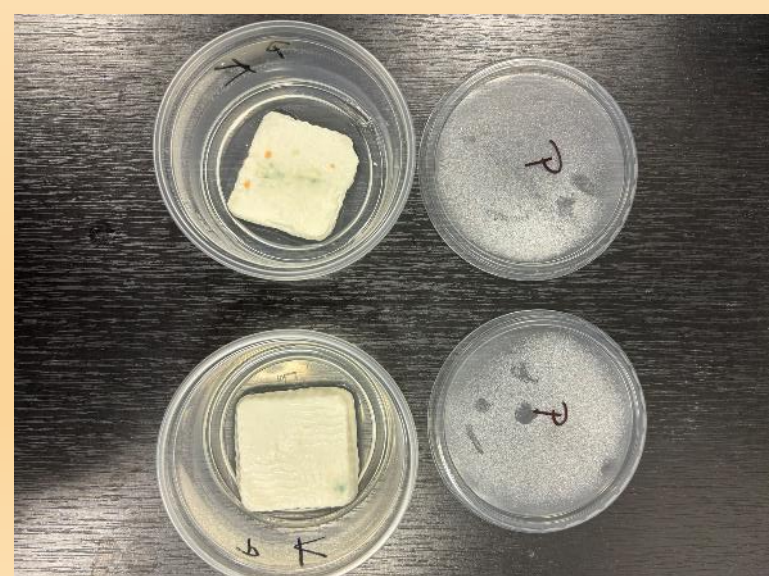
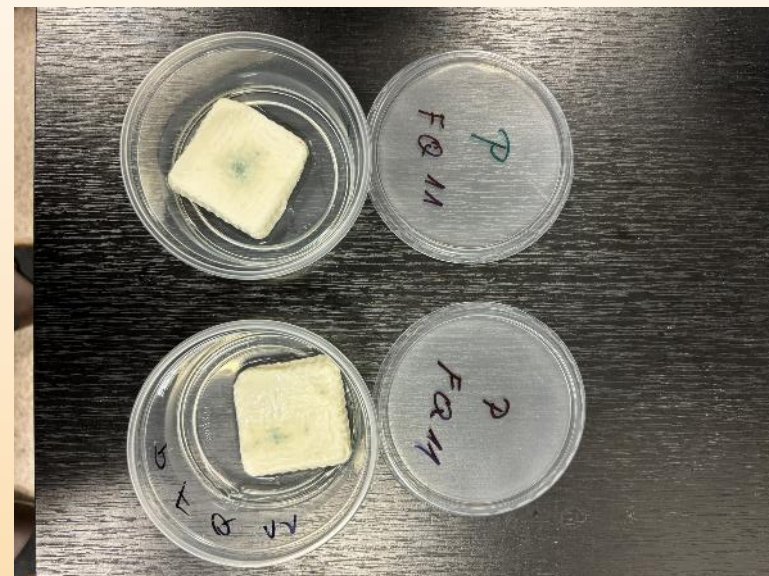
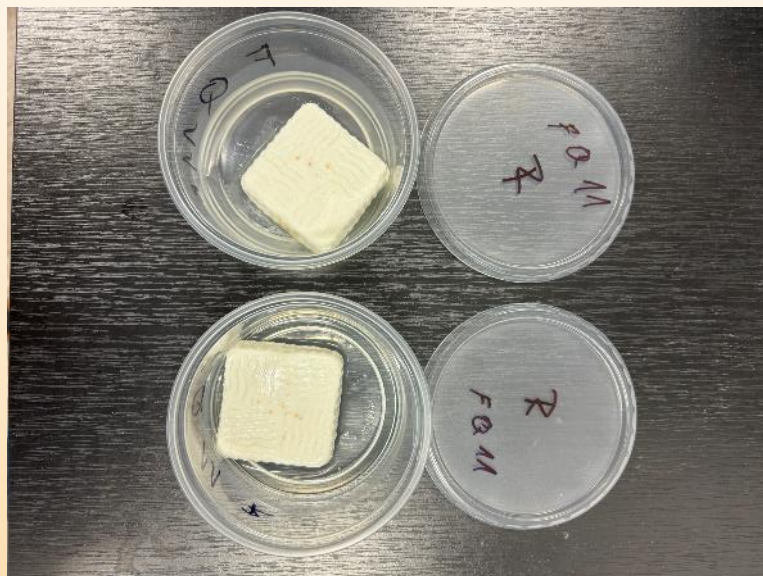
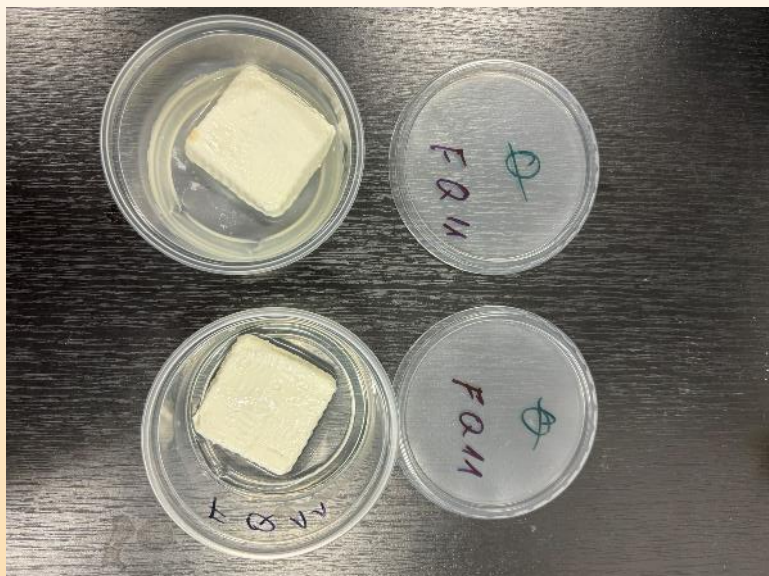


# Kultura FreshQ 9 (21. den - konec experimentu)

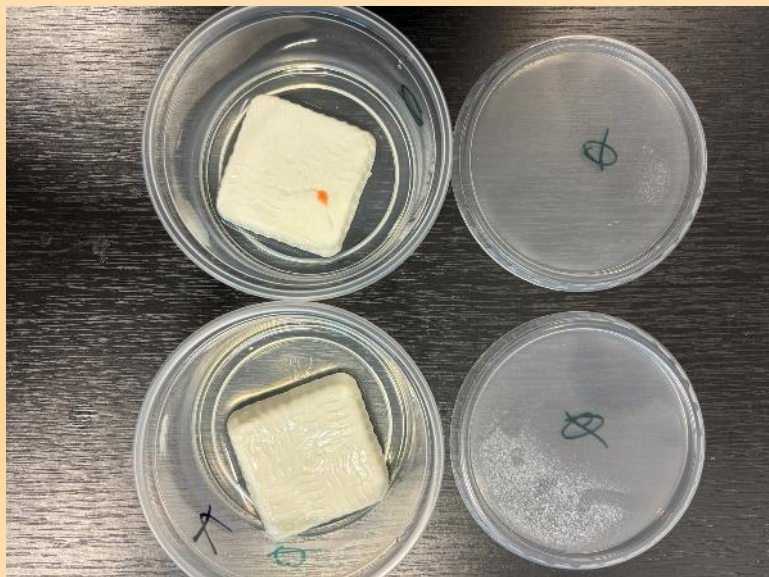
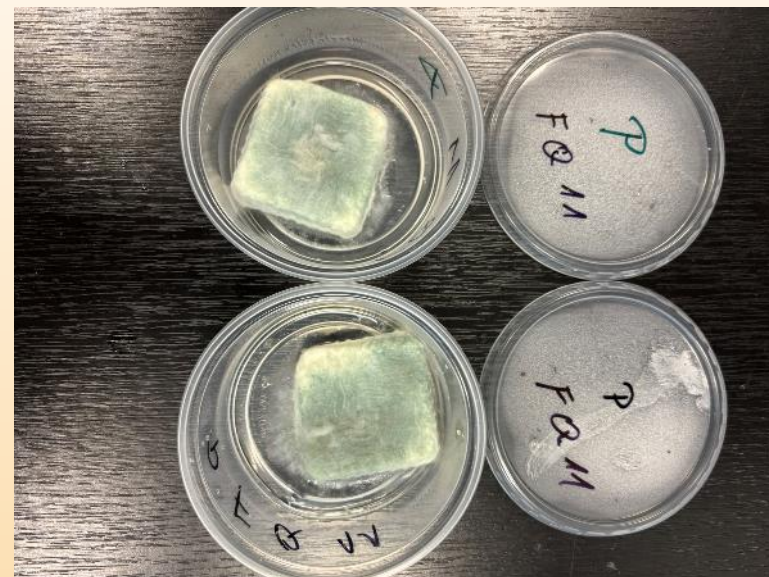
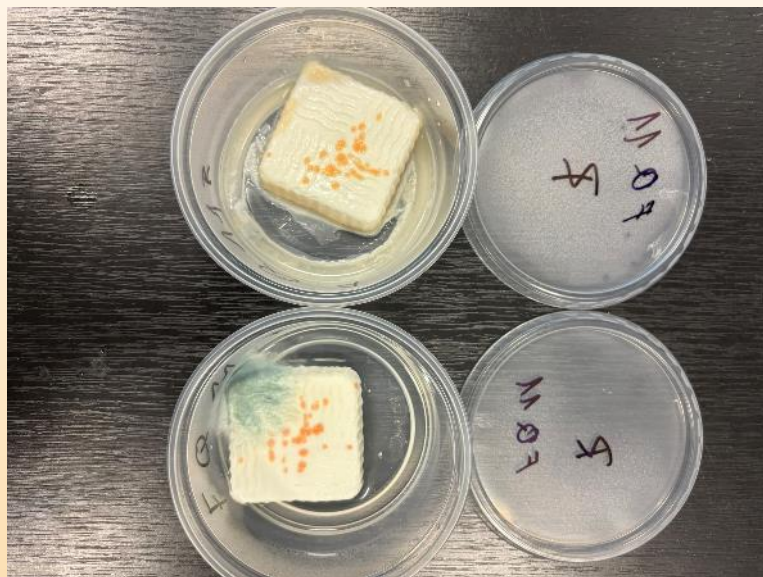
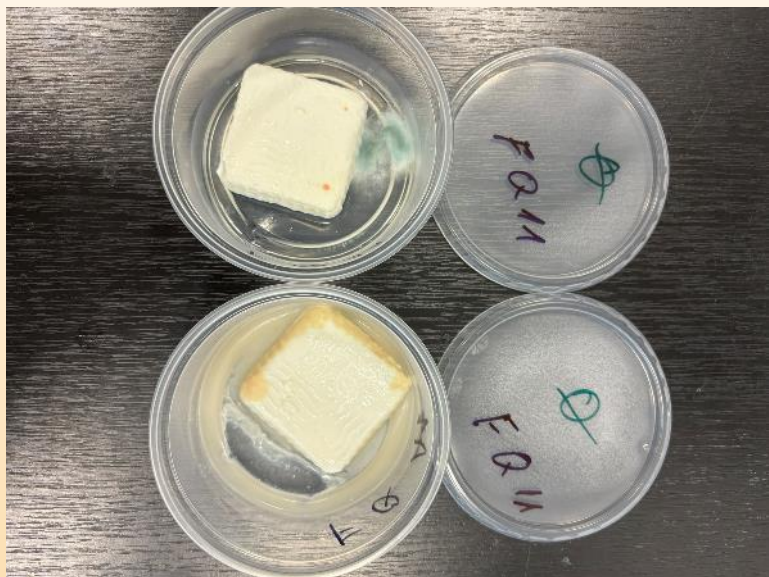




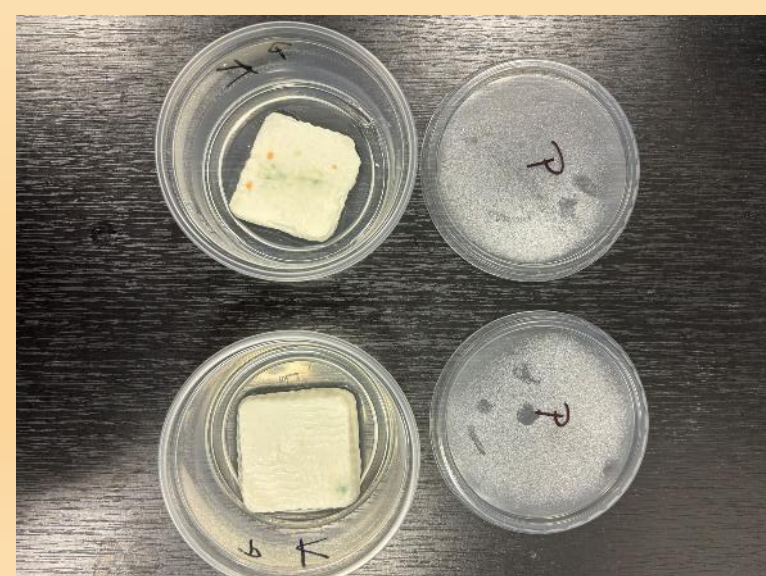
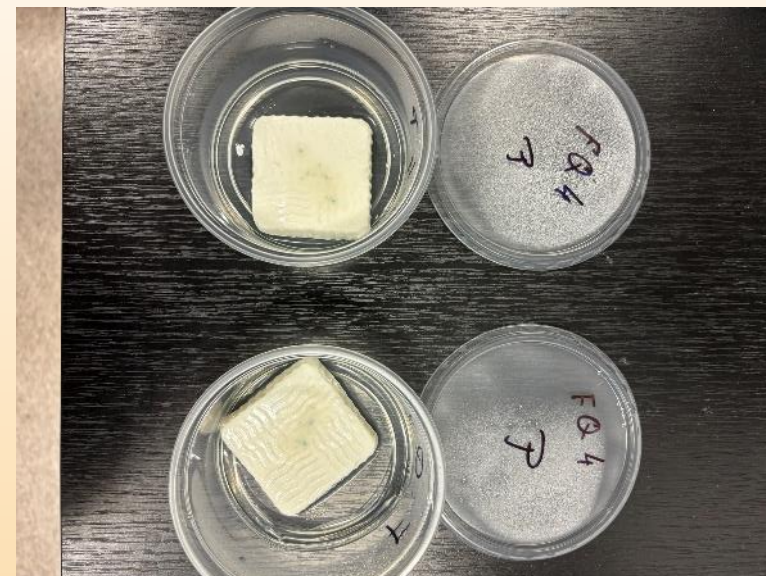
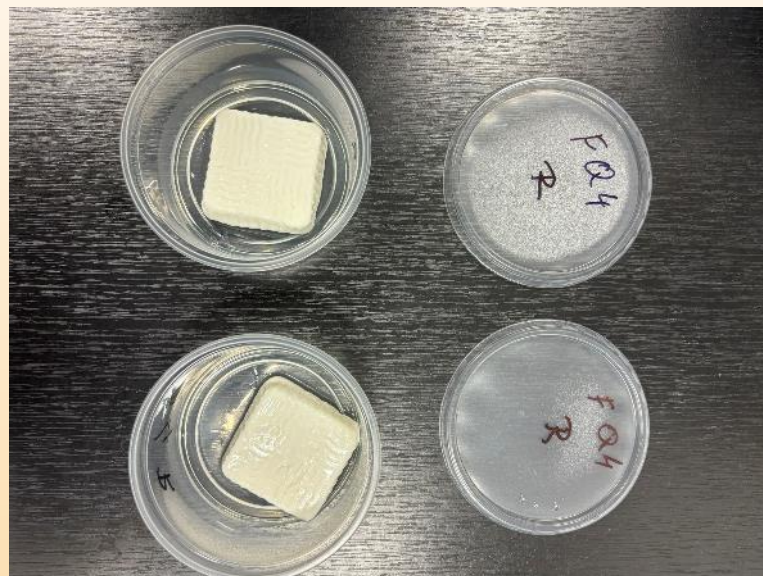
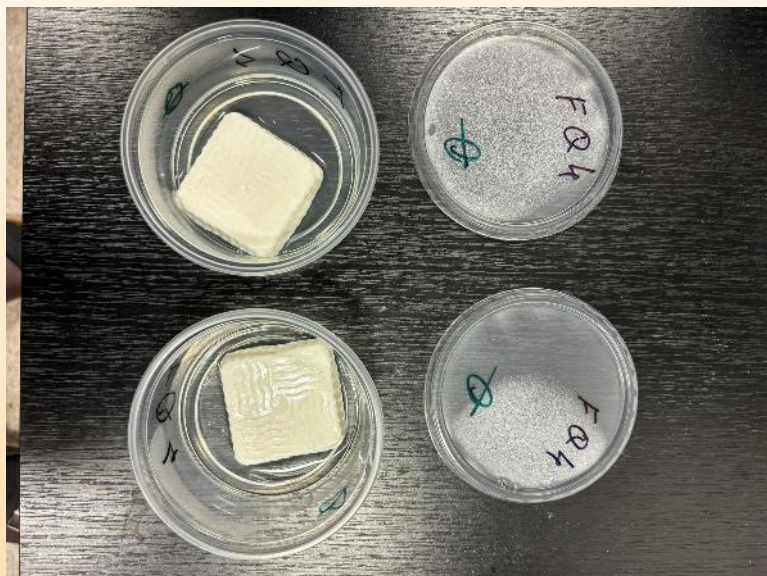
# Kultura FreshQ II (14. den)



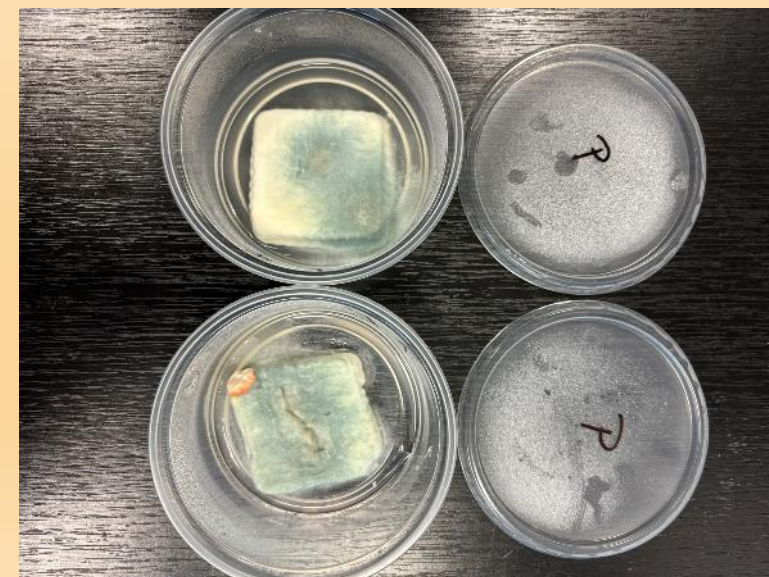
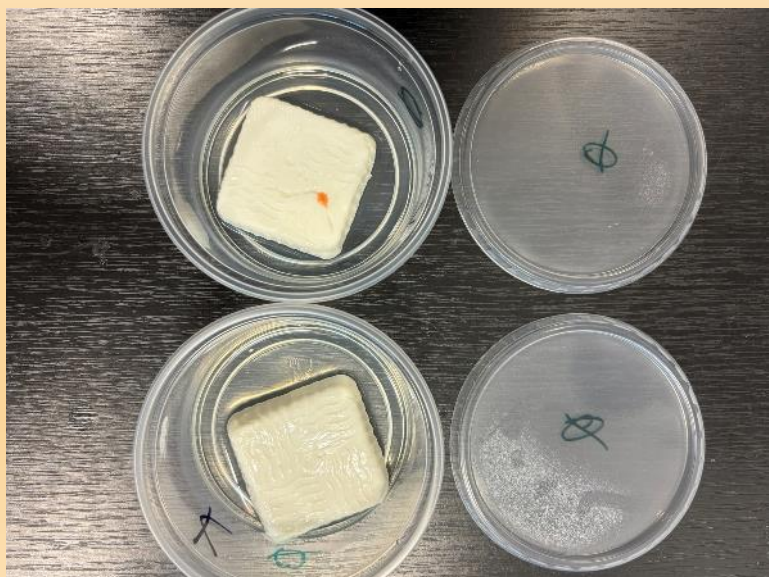
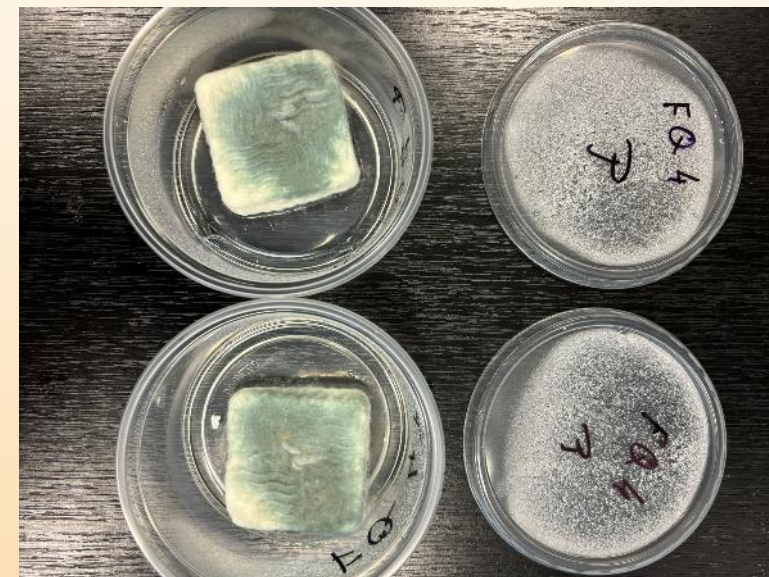
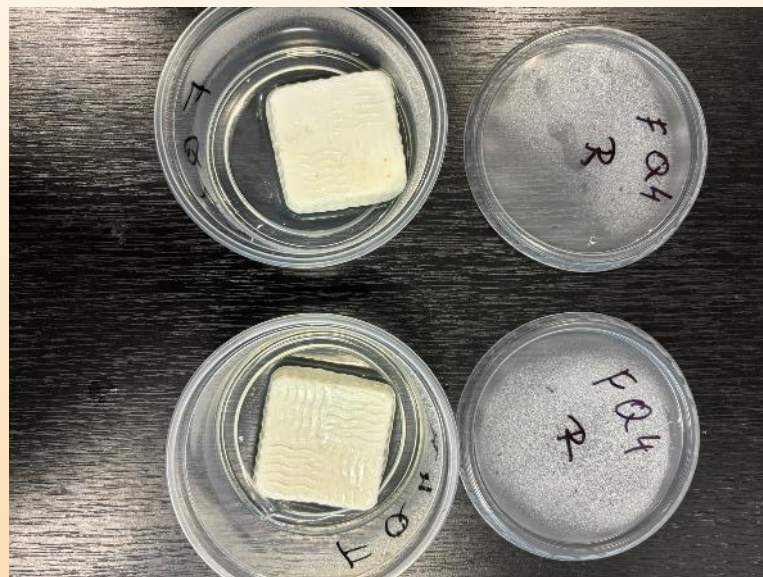
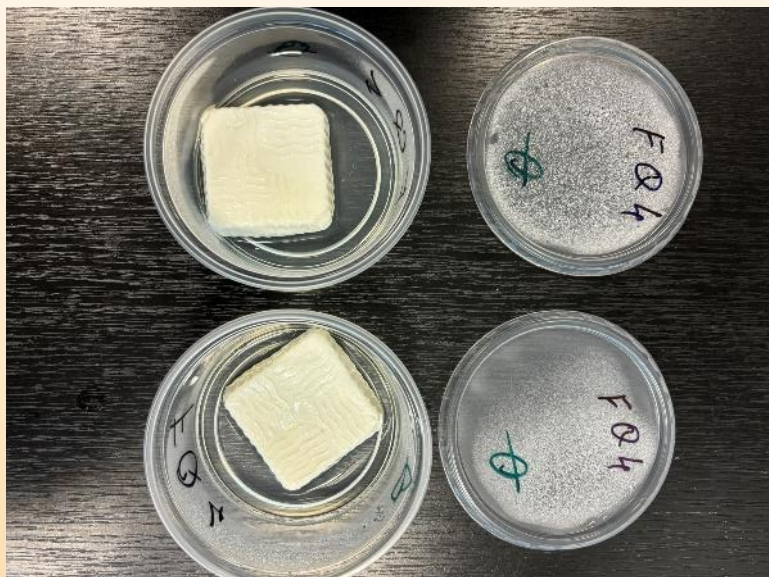
# Kultura FreshQ II (21. den - konec experimentu)



# Kultura FreshQ 4 (14. den)



# Kultura FreshQ 4 (21. den - konec experimentu)



## Závěr

Přídavek protektivních kultur v koncentraci 0,1 g/4 l mléka dokázal, po celou dobu experimentu, tj. tři týdny od výroby, u sýrů skladovaných v chladírenských podmínkách (8°C), významně potlačit:

- nárůst přirozené mikrobiální kontaminace u nezaočkované varianty,
- nárůst *Rhodotorula glutinis*,
- proti *Penicillium roqueforti* přídavek protektivních kultur neúčinkoval.

**Děkuji za pozornost**