



Bachelor's Thesis | 2016 |

Degree programme
Life technologies

Field of application
Food technology

Supervising professor
Dr Michael Beyrer
michael.beyrer@hevs.ch

Partner
Dr.-Ing. Ulrich Kulozik
Lehrstuhl für
Lebensmittelverfahrenstechnik
und Molkerietechnologie
Technische Universität München

Shelf-life and storage stability of microfiltrated whey concentrates

 Graduate Florian Migliarini

Objectives

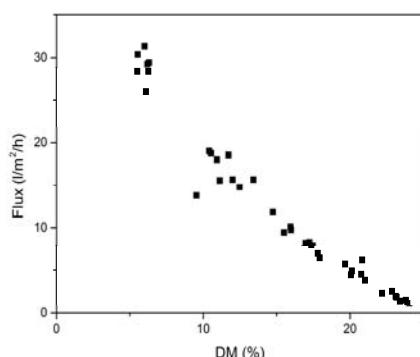
The aim of this study was to investigate the combination of concentration of whey by nanofiltration and preservation by microfiltration, as well as the monitoring of chemical, physical and microbial parameter during the filtration steps and a simulated storage time.

Methods | Experiences | Results

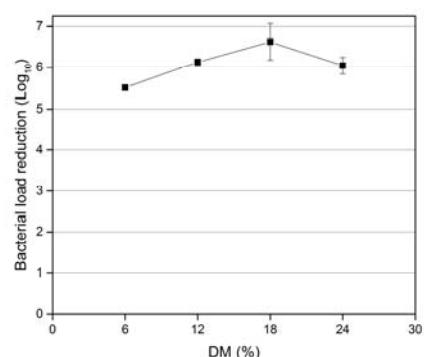
Microbial reduction during microfiltration and microbial growth during storage have been analysed by plate count method. A reduction of 6 log units has been achieved with microfiltration. The storage temperature showed a strong influence on the microbial growth. Samples reached 10^6 CFU/ml after two to five weeks at 4 °C and two to three weeks at 10 °C.

Mineral permeation during nanofiltration and microfiltration and mineral content change during storage were analysed by flame spectrophotometer. 49%, 58% and 5% permeation were observed for respectively sodium, potassium and calcium during nanofiltration. During storage, no significant mineral content changes were observed, except for calcium, which showed a 10% loss of solubility for samples concentrated to 24% DM at the end of the storage at 4 °C. Lactose content was analysed by HPLC. During storage, samples stored at 10 °C showed a higher lactose loss than those stored at 4 °C. The higher lactose loss (6%) was observed for samples with 24% DM content.

A pH drop of 1.5 pH-units has been observed for all concentrated whey samples. This change happened after one or two weeks at 10 °C and four to five weeks at 4 °C. DM content didn't have a significant impact on the pH drop. pH drop happened at the same time like microbial growth for all the samples.



Membrane flux as a function of dry matter content for all nanofiltrations



Log-reduction of whey microflora as a function of dry matter content