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## Efficiency of different NF-membranes for the enrichment of milk oligosaccharides

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Human milk oligosaccharides (MOS) stimulate the immune system, inhibit the adhesion of pathogens on the epithelial surface and exhibit potential prebiotic activity [1-4]. In comparison with human milk (5-8 gL<sup>-1</sup>), the amount of MOS in cow's milk is low (0.03-0.06 gL<sup>-1</sup>). For this reason, it is currently not possible to use bovine MOS as functional ingredients in food production [4].

The aim of the present work was to compare the efficiency of different nanofiltration (NF) - membranes for the enrichment of MOS.

Initially, bovine milk was skimmed and ultrafiltered (NMWCO= 5 kDalton). Lactose in the UF permeates was hydrolysed by action of  $\beta$ -galactosidases. Subsequently, the NF experiments were carried out in a laboratory device (ÄKTA-Crossflow). Flat sheet NF membranes of different composition (composite, cellulose acetate, polyethersulfone) were applied. The MOS composition of the NF retentates was determined by high pH-anion exchange chromatography (HPAEC) with pulsed amperometric detection (PAD) and parallel online electrospray ion-trap mass spectrometry (IT-MS).

The highest retention of acidic oligosaccharides by nanofiltration (recovery= 84-88%) was achieved by a composite membrane with 500-1000 Dalton. NF membranes with a NMWCO of 150-300 Dalton revealed a recovery of about 72% of the acidic and neutral oligosaccharides. To estimate the enrichment, the MOS content in relation to total sugar in NF retentate was determined. The highest MOS content was achieved with a 200 Dalton cellulose acetate membrane (62%) and the 500-1000 Dalton composite membrane (57%). Further investigations will focus on potential bioactive properties of the NF retentates of MOS.

### References:

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