

**T228** Effect of pore size and temperature on the fractionation of buttermilk using microfiltration. P. Morin\*<sup>1</sup>, R. Jimenez-Flores<sup>2</sup>, and Y. Pouliot<sup>1</sup>, <sup>1</sup>Centre de recherche STELA, Université Laval, Quebec, Canada, <sup>2</sup>Dairy Products Technology Center, California Polytechnic State University, San Luis Obispo, CA..

Buttermilk is a unique dairy source of milk fat globule membrane (MFGM) lipids such as phospholipids and sphingolipids that have been recognized for their functional and nutraceutical properties. MFGM lipids can be isolated by solvent extraction but this approach is not suitable for dairy processing plants. Membrane processing such as crossflow microfiltration can be the first step to selectively concentrate buttermilk lipids which could be used to create novel functional ingredients. The use of microfiltration (MF) for the separation of MFGM lipids in buttermilk is restricted by the presence of caseins and whey proteins. A better knowledge of factors improving protein and lipid separation in buttermilk microfiltration is needed. Crossflow MF with 3 pore size (1.4  $\mu\text{m}$ , 0.8  $\mu\text{m}$ , 0.1  $\mu\text{m}$ ) and 3 temperatures (50°C, 25°C, 7°C) was carried out on fresh or reconstituted buttermilk. Transmission of lipids through the membrane was significantly ( $p \leq 0.05$ ) lower with the 0.1  $\mu\text{m}$  membrane compared to the 0.8 and 1.4  $\mu\text{m}$  membranes. However, retention level of proteins was the highest (78.3 %) using the 0.1  $\mu\text{m}$  membrane and the lowest level was obtained using the 0.8  $\mu\text{m}$  membrane (38.5 %). Temperatures tested did not induce significant ( $p \geq 0.05$ ) differences in protein transmission level and lower fat transmissions were observed at 25°C. Temperature increases had an important positive effect on permeation fluxes. Superior fat retention was also noticed using fresh buttermilk by opposition to reconstituted buttermilk. Phospholipids analysis showed relative transmission of all main species of phospholipids found in buttermilk (phosphatidylethanolamine, phosphatidylcholine and sphingomyelin) at every combination of pore size, temperature and buttermilk type.

**Key Words:** Buttermilk, Microfiltration, Phospholipids