

**T217 Aerobic endospore distribution in a process to produce high phospholipid ingredients from commercial reconstituted buttermilk.** L. Lassonde\* and R. Jimenez-Flores, *Cal Poly DPTC*.

Bacterial endospores survive standard industrial processes to become food spoilage organisms when later reconstituted with water and exposed to appropriate environments to induce germination and growth. The objective of the study was to 1) Isolate and characterize a library of wild-type *Bacillus spp.* from a variety of commercial buttermilk powder (BMP) including endospore counts, metabolic activity and germination rates; 2) Characterize rejection of endospores in a pilot scale cold micro-filtration process on reconstituted BMP; and 3) Characterize the survivability of endospores when exposed to super critical CO<sub>2</sub>. The library of endospores isolated from commercial reconstituted BMP consists of 80 well-characterized strains of bacilli. Biological comparisons are possible at DPTC with bacilli from different dairy products. The process used reconstituted BMP (20 L per batch and 10% TS) and subjected to a micro-filtration process using a 0.8µm ceramic porous filtering system at 4°C, to enrich phospho-lipids into the retentate. Diafiltration with distilled water was added through the system three times the original volume of the reconstituted buttermilk (60 L). Both retentate and permeate were analyzed for TPCs, mesophilic and thermophilic endospore counts to determine endospore counts in the retentate. Mesophilic-spore counts in retentate and permeate were consistently >10<sup>2</sup> cfu/ml and <25 cfu/ml respectively. Retentate and permeate thermophilic spore counts were 10<sup>3</sup>cfu/ml and <5cfu/ml respectively. The original BMP had meso- and thermophilic counts of 10<sup>2</sup> and 10<sup>3</sup> cfu/ml. The total balance of spores in the system resulted in a retention of between 75 to 98% of the total spores, and no significant difference between mesophilic and thermophilic counts. Supercritical inactivation of spores show a complex, thermal/supercritical lethal curve. It is apparent that the overall composition of the BMP interferes with the spores exposed to the treatment. Destruction rates were measured between 90 to 99.9% of the original spores in the retentate.

**Key Words:** Buttermilk powder, Micro-filtration, Bacillus