

1156 Effects of seasonal and regional variations in milk components on the buffering capacity of milk in California. A Harris*¹, P Tong¹, S Vink¹, J Izco¹, and R Jimenez-Flores¹, ¹ California Polytechnic State University.

Milk samples from thirteen California dairy processing (cheese, fluid milk, butter and powder) facilities were examined over one year to understand seasonal and regional variations in buffering capacity. Total protein, casein, inorganic phosphate and citrate levels were analyzed to assess their impact on the buffering capacity. These components have been found to have the greatest impact on buffering capacity. Little seems to have been done to correlate those seasonal changes with seasonal differences in buffering capacity.

Samples from the 13 dairy facilities were taken two times per month. Individual samples, as well as combined monthly samples, were stored frozen and thawed prior to sampling for analysis. Composite monthly samples were analyzed for total protein and casein, while individual, bi-weekly samples were examined for phosphate and citrate. Citrate and phosphate concentrations were analyzed simultaneously using a rapid Capillary Electrophoresis method. Total nitrogen, non-casein nitrogen, and non-protein nitrogen were measured by Kjehldahl Nitrogen determination. Forward titration curves were obtained by acidification of milk to measure buffering capacity.

The lowest buffering capacity values were witnessed in samples during the September sampling (18.51 0.17 ml of titrant required to achieve pH 4.0). Maximum buffering values were reached in December (19.20 0.23 ml of titrant). These trends were also witnessed in casein, phosphate and citrate with citrate and phosphate values peaking earlier in the year than casein. It is likely that the variations in buffering capacity and the associated relationships to variability in milk composition can be traced back to known effects of feed, stage of lactation, breed and other dairy farm management practices.

Key Words: Buffering Capacity, Citrate, Phosphate