# Effect of Enriched Lactoferrin Supplementation (ELS) on Bone Health in Post-Menopausal Women

## (Preliminary Results)

## MATERIALS AND METHODS

Samples of non-fasting blood and un-timed urine samples were collected from subjects with informed consents. Subjects were instructed to maintain current diet, lifestyle, and medications (if any) during the study. At each visit venous blood was drawn, allowed to clot at room temperature for 30 to 60 minutes, then stored for no more than 4 hours at 4°C before centrifugation to collect serum. All sera were then stored at –80°C for no more than 1 month and thawed at room temperature immediately before the activity of bone turnover markers was measured.

**Measurement of N-telopeptide (NTx) levels in the serum.** Type I collagen telopeptide sequences that contain cross-linking residues of pyridinolines are reliable osteoclast-specific markers of bone resorption. Serum NTX is a product of type I collagen degradation and an indicator of bone resorption. Serum NTX was measured by a commercially available quantitative competitive-inhibition ELISA (Osteomark NTX Serum, Ostex International, Inc., Seattle, WA). Results are expressed as nanomoles of bone collagen equivalents per liter of serum (nmol/L BCE/L). The ranges of the NTX serum levels in healthy women were 6.2 to 19 nmol/L BCE/L with a mean of 12.6 nmol/L BCE/L (provided by the assay manufacturer).

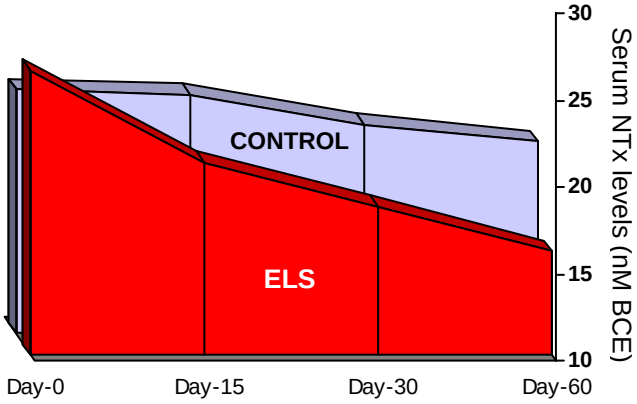
**Measurement of bone alkaline phosphatase (BAP) levels in serum.** Serum levels of BAP are a highly specific and sensitive indicator of alteration in bone turnover. BAP is a tetrameric protein located in the plasma membrane of osteoblasts; it plays an active role in bone formation and skeletal mineralization. Serum BAP activity was measured by a commercially available quantitative enzyme-linked immunoassay (METRA BAP EIA kit, Quidel Corp., San Diego, CA) in which serum BAP is immobilized by specific antibody and its activity measured using 4-nitrophenyl phosphate as substrate. Results are expressed as moles of substrate hydrolyzed per minute per liter of serum at room temperature (mol/min/L). The ranges of the BAP activities in healthy women of ages >45 years were 14.2 to 42.7 mol/min/L with a median of 25 mol/min/L (provided by the assay manufacturer).

## RESULTS

**Control Group** = Calcium only

**ELS Group =** ELS + Calcium

### BONE RESORPTION




### BONE FORMATION