

**EFFECTS OF TEMPERATURE AND HANDLING CONDITIONS ON LIPID EMULSION STABILITY IN CENTRALLY ADMINISTERED VETERINARY PARENTERAL NUTRITION ADMIXTURES**

Elizabeth Thomovsky, DVM

Dr. FA Mann, Dissertation Supervisor

**ABSTRACT**

**Objective:** To determine the temporal change in lipid particle size in veterinary parenteral nutrition (PN) admixtures kept at room temperature (23°C) versus admixtures filtered, refrigerated, and agitated.

**Procedure:** Fifteen 2 L bags of PN admixture containing 50% dextrose (525 mL), 20% lipid emulsion (453 mL), 8.5% amino acids/electrolyte solution (840 mL) and vitamin B complex (5 mL) were delivered through an intravenous pump (16 mL/hr) for 96 hours. Group 1 (n=3) was static, Group 2 (n=3) was continuously agitated, Group 3 (n=3) was agitated for 5 minutes every 4 hours, Group 4 (n=3) was static at 4°C, and Group 5 (n=3) was filtered (5 µm pore). After 96 hours, two 10 mL samples of PN (n=3) were cultured (bacterial). Samples (1.0 mL) were collected at 0, 24, 48, 72, and 96 hours and examined with transmission electron microscopy. Computer software (Adobe Photoshop & Fovea Pro) provided lipid particle diameters. Significance of time effects on size distribution was evaluated with Repeated Measures ANOVA.

**Results:** There was no significant difference in lipid particulate size among or within groups over time ( $p \leq 0.05$ ). Group 2 separated into a visible oil layer by 72 hours. There was no bacterial growth (aerobic or anaerobic).

**Conclusion:** Lipid particulate size is stable in this veterinary PN admixture for more than 48 hours at 23°C. Manipulations of PN are unnecessary to prolong lipid particle stability; continuous agitation may hasten lipid breakdown.