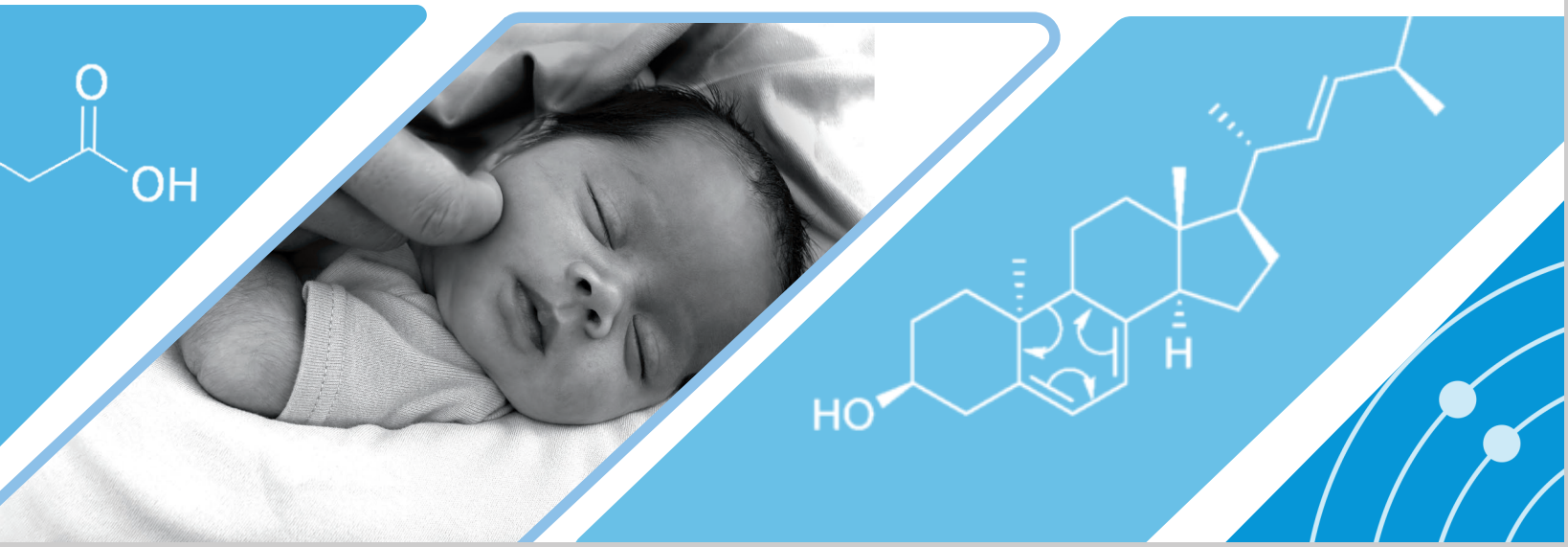

CHAPTER 3 : TERM NUTRITION

Plasma Carotenoid Concentrations of Infants Are Increased by Feeding a Milk-Based Infant Formula Supplemented With Carotenoids

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Summary This study evaluated the feasibility and suitability of adding carotenoids to infant formula. Plasma concentrations of β-carotene, lutein, and lycopene were measured in infants fed formulas with different levels of carotenoids, in comparison with a breastfed group.

- Healthy term infants (n=99) were recruited between 14 and 35 days of age and studied for 56 days. Infants were fed milk-based study formulas or human milk, and anthropometrics were evaluated at days 1, 28, and 56. This was a controlled, randomized, double-blind, parallel clinical study.
- Plasma carotenoid concentrations were assessed at study days 1 and 56. Infants (n=72) were randomly assigned to receive 1 of 3 formulas:
  - Control formula with no added carotenoids (27.8 µg/L of total carotenoids)
  - Study formula with 129.5 µg/L of total carotenoids (L1)
  - Study formula with 225.8 µg/L of total carotenoids (L2)
- Exclusively breastfed infants (n=27) served as a nonrandomized reference group. Mothers of breastfed infants were given information about the value of fruits and vegetables in their diets, and carotenoid intake was assessed with a food frequency questionnaire. Parents recorded information about stool characteristics, dietary intake, and incidence of spitting up/vomiting.
- Blood samples were collected from infants and breast milk samples were collected from mothers. Carotenoid concentrations were measured using reverse phase high-performance liquid chromatography with UV-visible detection at 450 nm.
- Carotenoid supplementation of formula significantly increased plasma concentrations of these carotenoids in term infants. In general, mean plasma lutein, β-carotene, and lycopene concentrations in infants fed supplemented formula were within the range of those in human milk–fed infants. Among all study groups, anthropometric measurements were comparable. Formulas with additional carotenoids were well tolerated.

Importance This study is important in that it is one of few clinical studies that have evaluated the plasma concentrations of carotenoids in breastfed infants and infants fed formula supplemented with carotenoids.