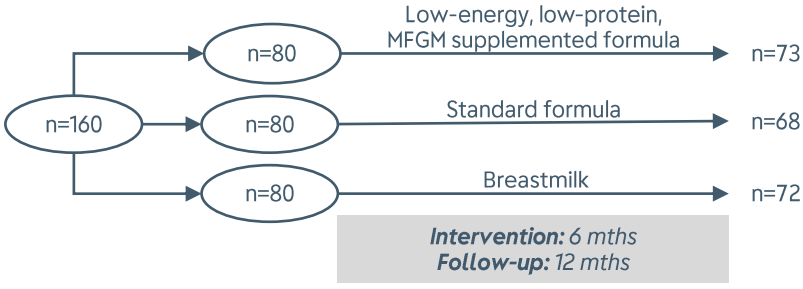
Neurodevelopment, nutrition, and growth until 12 mo of age in infants fed a low-energy, low-protein formula supplemented with bovine milk fat globule membranes: a randomized controlled trial

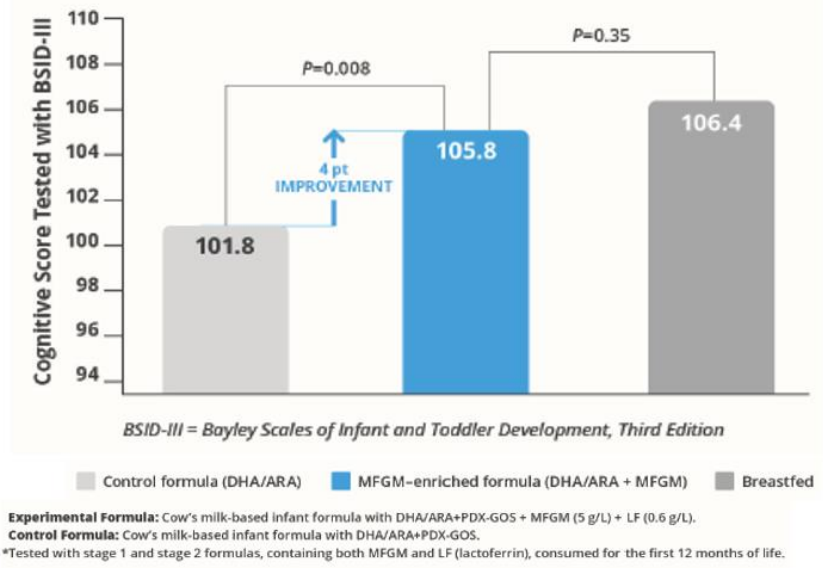
Timby N, Domellöf E, Hernell O, Lönnerdal B, Domellöf M. Am J Clin Nutr. 2014 Apr;99(4):860-8.

Objective: To test the hypothesis that feeding an infant formula with reduced energy and protein densities and supplemented with bovine milk fat globule membrane (MFGM) reduces differences in cognitive development and early growth between formula-fed and breastfed infants

Inclusion Criteria:
- <2 months old
- Gestational age at birth 37-42 weeks
- Birthweight 2500-4500g
- No chronic illness
- Exclusive formula feeding (except breastfeeding group) at inclusion until 6 months



ENDPOINTS	FINDINGS *(MFGM-supplemented vs standard)*
Neurodevelopment	Bayley-III • Higher **cognitive** score • No difference in **motor** (gross & fine) and **verbal** (receptive & expressive) scores
Growth	• No difference in **weight**, **length**, **head circumference** and **BMI**
Biochemical analysis	• No difference **plasma insulin** and **blood urea nitrogen** • Varied difference in **plasma amino acid pattern**
Dietary intake	• Higher daily **volume** and **fat** intake • Lower **carbohydrate** intake • No difference in **protein** and **energy** intake



Experimental Formula: Cow's milk-based infant formula with DHA/ARA+PDX-GOS + MFGM (5 g/L) + LF (0.6 g/L).
Control Formula: Cow's milk-based infant formula with DHA/ARA+PDX-GOS.
*Tested with stage 1 and stage 2 formulas, containing both MFGM and LF (lactoferrin), consumed for the first 12 months of life.

Conclusion: MFGM supplementation to infant formula narrows the gap in cognitive development between breastfed and formula-fed infants. Between 2 and 6 mo of age, formula-fed term infants have the capacity to upregulate their ingested volumes when the energy density of formula is reduced from 66 to 60 kcal/100 mL.