**WHAT ARE HMOs?**
Unique prebiotics found naturally in human milk | Food for beneficial bacteria in the infant’s gut | 3rd most abundant solid component of human milk

**COMPONENTS OF HUMAN MILK**
Major nutritional components of human milk are: protein, carbohydrates, and lipids.

**HUMAN MILK**

- WATER
- MACRONUTRIENTS
  - PROTEIN
  - LIPIDS
  - CARBOHYDRATES
  - HUMAN MILK OLIGOSACCHARIDES

**2'-FL HMO**
- Approximately 75-85% of mothers secrete 2'-FL HMO in their breast milk.
- 2'-FL added to formula has the identical structure as 2'-FL in human milk.
- Prebiotics—food for beneficial bacteria.
- First clinical study with 2'-FL added to infant formula narrows the gap between human milk & infant formula.

**EARLY IMMUNE DEVELOPMENT**
70% of the immune system is in the digestive tract, and prebiotics support colonization of the gut which helps support immune system development.

**BENEFITS OF 2'-FL HMO Expand Beyond the Gut to Support the Immune System.**
- A small portion of 2'-FL HMO ingested is absorbed in the infant’s intestine and reaches the systemic circulation.
- In a clinical study, 2'-FL HMO was shown to lower levels of multiple inflammatory cytokines to be more like levels in breastfed infants.
- In a clinical study of infants fed formula with 2'-FL HMO, two markers of immune function associated with the severity of a respiratory infection (RSV) were more like breastfed infants than infants fed the same formula without 2'-FL HMO.

**PREBIOTICS & MORE**
Emerging research indicates potential multifunctional benefits:

**COGNITION**
- Learning & memory
- Long-term potentiation
- Brain molecular markers

**IMMUNITY**
- Pathogen receptor decoy
- Reduced symptoms of food allergy
- Immune modulation

**GI TOLERANCE**
- Prebiotic
- Gut motility
- NEC

**SUPPORTING EVIDENCE**
Provide preclinical and clinical evidence identifying the role of HMOs in health & development. (2000-2017)

*Most studies were animal-based.
*Refer to references.

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