HUMAN MILK OLIGOSACCHARIDES (HMOs):
WHY ARE THEY SO BENEFICIAL IN INFANT NUTRITION?

Breastfeeding is best

Breastfeeding is universally recognised as the optimal nutrition for babies.[1–3] UK and WHO guidelines recommend exclusive breastfeeding for the first 6 months of an infant's life, and breastfeeding in combination with balanced, complementary foods thereafter.[1–3]

Research suggests that breastfed babies have fewer infections and may have a stronger immune system,[3] which in part may be due to the presence of human milk oligosaccharides (HMOs) in breast milk.[4,5]

What are HMOs?

HMOs are complex carbohydrates unique to breast milk that support the developing infant's immune system.[4–7] They do this in four main ways:

- Feeding good bacteria within the gut, where 70–80% of the body's immune cells live[5,6]
- Blocking bad bacteria from attaching to the gut and doing harm[5–7]
- Strengthening the developing gut barrier[5–7]
- Helping to balance the immune system[5,6]

SMA® Nutrition have been researching HMOs for 30 years

SMA® Nutrition have been leading research in baby nutrition for over 100 years and are dedicated to learning more about breast milk. Our research into HMOs in breast milk started in the 1980s and we have been pioneering HMO research for 30 years.

PROMISING TRIAL RESULTS:
Turn over page for results of a study into the effects of infant formula with HMOs on growth and morbidity...

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CLINICAL EVIDENCE SUMMARY

INFORMATION FOR HEALTHCARE PROFESSIONAL USE ONLY
BREASTFEEDING IS BEST FOR BABIES

EFFECTS OF INFANT FORMULA WITH HMOs ON GROWTH AND MORBIDITY[8]

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Design & objective: Randomised, multicentre, double-blind trial to evaluate the effects of infant formula supplemented with two HMOs* (2'fucosyllactose [2'FL] and lacto-N-neotetraose [LNnT]) on infant growth, tolerance and morbidity

POPULATION	PRIMARY ENDPOINT	SECONDARY ENDPOINTS
Healthy infants, recruited at 0–14 days old, randomised to either control (n=87) or intervention (n=88) group	Weight gain (g/day) from baseline to age 4 months	Additional anthropometric measures, GI tolerance and behavioural patterns, and morbidity through age 12 months

Results:

Primary endpoint

No significant difference in weight gain from baseline to age 4 months between groups

Secondary endpoints

Morbidity – infants who received test (vs control) formula had:

- 70% lower risk of parent-reported **bronchitis** through 12 months of age (P≤0.01)
- 55% lower risk of parent-reported **LRTIs** through 12 months of age (P<0.05)
- 56% lower use of **antipyretics** through 4 months of age (P<0.05)
- 53% lower use of **antibiotics** through 12 months of age (P<0.05)

Digestive tolerance – no significant difference between test and control groups

Stool characteristics – significantly softer stools in test vs control group at 2 months (P=0.021)

Behavioural patterns – fewer night-time awakenings were reported in test group at 2 months (P=0.036); in a subgroup of infants delivered by caesarean section, colic at 4 months was reported less frequently in the test group (P=0.035)

Formula intake – mean daily formula intake was similar between groups

Conclusion:

Infant formula supplemented with HMOs with 2'FL and LNnT is safe, well tolerated, and supports age-appropriate growth.

*HMOs: structurally identical Human Milk Oligosaccharides, not sourced from breast milk.

GI: gastrointestinal; LRTI: lower respiratory tract infection; WHO: World Health Organisation.

References:

1. World Health Organisation (2002). Infant and young child nutrition: Global strategy on infant and young child feeding. Available at: http://apps.who.int/gb/archive/pdf_files/WHA55/ea5515.pdf (accessed February 2019). **2.** Unicef (2015). Improving breastfeeding, complementary foods and feeding practices. Available at: http://www.unicef.org/nutrition/index_breastfeeding.html (accessed February 2019). **3.** Victora CG, Bahl R, Barros AJD, *et al*. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet 2016; 387: 475–90. **4.** Kunz C. Historical aspects of human milk oligosaccharides. Adv Nutr 2012; 3(3): 430S–9S. **5.** Bode L. Human milk oligosaccharides: every baby needs a sugar mama. Glycobiology 2012; 22(9): 1147–62. **6.** Jantscher-Krenn E, Bode L. Human milk oligosaccharides and their potential benefits for the breast-fed neonate. Minerva Pediatr 2012; 64(1): 83–99. **7.** Smilowitz JT, Lebrilla CB, Mills DA, *et al*. Breast milk oligosaccharides: structure-function relationships in the neonate. Annu Rev Nutr 2014; 34: 143–69. **8.** Puccio G, Alliet P, Cajozzo C, *et al*. Effects of infant formula with human milk oligosaccharides on growth and morbidity: A randomized multicenter trial. J Pediatr Gastroenterol Nutr 2017; 64: 624–31.

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