SMA® ADVANCED RANGE
HUMAN MILK OLIGOSACCHARIDES (HMOs):
THE LATEST BREAKTHROUGH IN INFANT NUTRITION
Breastfeeding is best for babies

Breastfeeding is universally recognised as the optimal nutrition for babies, and is associated with many nutritive and non-nutritive benefits.\(^1\)\(^-\)\(^4\) 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.\(^5\)\(^,\)\(^6\)

Breastfed babies have fewer infections and may have a stronger immune system\(^7\)\(^,\)\(^8\)

**What are human milk oligosaccharides (HMOs)?**

Human milk contains bioactive components that confer protective effects on the newborn. These include complex carbohydrates called human milk oligosaccharides (HMOs).

HMOs are the third most abundant solid component in human milk and have a very unique structure. This unique structure results in specific functions within the human body.\(^5\)\(^,\)\(^6\)\(^,\)\(^9\)\(^,\)\(^10\)

HMOs are unique to human breast milk and are not found in significant amounts in any other mammalian milk.\(^5\)\(^,\)\(^6\)\(^,\)\(^9\)\(^,\)\(^10\)

**Immune and nutritive components in breast milk\(^11\)\(^-\)\(^14\)**

**EXAMPLES**

- **Human Milk Oligosaccharides (HMOs)**\(^11\)
  - Majority not absorbed in the GI tract\(^1\)\(^1\), i.e. have no nutritive value\(^13\)

- **Proteins, carbohydrates, fats**\(^13\)
  - Majority absorbed in the GI tract\(^1\)\(^4\)

**KEY FEATURES**

- **IMMUNE COMPONENTS**
  - Human Milk Oligosaccharides (HMOs)\(^11\)
- **NUTRITIVE COMPONENTS**
  - Proteins, carbohydrates, fats\(^13\)

**KEY FUNCTION**

- **SUPPORT IMMUNE FUNCTIONS**
- **SUPPORT HEALTHY GROWTH AND DEVELOPMENT**

**These benefits may be partly due to the effect of breast milk on the intestinal microbiota.**\(^8\)

WHO: World Health Organisation

GI: gastrointestinal.
What do HMOs do in breast milk?

Research suggests that HMOs support the developing infant’s immune system in four main ways:\textsuperscript{5,6,9,10}

- **Blocking bad bacteria from attaching to the gut and doing harm\textsuperscript{6,9,10}**
- **Helping to balance the immune system\textsuperscript{6,9}**
- **Selectively feeding good bacteria within the gut, where 70–80\% of the human body’s immune cells live\textsuperscript{6,9}**
- **Strengthening the developing gut barrier\textsuperscript{6,9,10}**

HMOs offer specific benefits compared with GOS/FOS

The structure of HMOs is unique and fundamentally different to GOS/FOS (which are not present in human milk).

This unique structure of HMOs allows them to have targeted benefits that are not present with GOS/FOS.\textsuperscript{6,9,10}

**HMOs**

- **PRESENT IN HUMAN MILK**
  - Blocks pathogens (bacteria, viruses and their toxins) through a specific decoy function\textsuperscript{6,9,10}
  - Highly effective in increasing systemic and gastrointestinal immune cell populations\textsuperscript{15,16}

**GOS/FOS**

- **NOT PRESENT IN HUMAN MILK** (Plant sourced)
  - Does not reduce potentially pathogenic bacteria in the gastrointestinal tract\textsuperscript{17}
  - Less effective in increasing systemic and gastrointestinal immune cell populations\textsuperscript{15}
SMA® Nutrition have been researching HMOs for 30 years

At SMA® Nutrition, we 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.

SMA® Nutrition the Pioneer in HMOs
30 years HMO research

‘80s
Nestlé’s first exploratory research with HMOs
‘90s
3 Nestlé publications on HMOs

2006
Nestlé partnership with Glycom to develop HMOs

2012
First Infant Formula Clinical Study with Nestlé’s HMOs

2007
First production of Nestlé’s HMOs at lab scale

2016
Nestlé’s 2 HMOs (2’FL & LNnT)

Until 2017
17 Nestlé publications on HMOs

2019
Launch of the SMA® ADVANCED Range with HMOs*

Latest research on infant formula supplemented with HMOs*18

A 2017 clinical trial evaluated the effects of First Infant Milk containing two HMOs* (2’FL & LNnT) on growth, tolerance and morbidity in infants.18

INTERVENTION GROUP
First Infant Milk with 2’FL and LNnT (n=88)

CONTROL GROUP
1.2 g/100 mL, intact protein formula without HMOs (n=87)

Recruitment age of 14 days or less; 6-month intervention period.

Infants who received the test First Infant Milk vs control:

**Primary outcome**
No significant difference in weight gain

**Secondary outcome**
- 70% lower risk of parent-reported bronchitis
- 55% lower risk of parent-reported LRTIs
- >50% lower use of antipyretics and antibiotics

First Infant Milk with HMOs* 2’FL & LNnT is safe, well tolerated, and supports age-appropriate growth

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

2’FL: 2’fucosyllactose; LNnT: lacto-N-neotetraose; LRTI: Lower Respiratory Tract Infection.
**SMA® ADVANCED First Infant Milk**

From birth

- The 1st infant milk in the UK & Ireland to contain HMOs* (2’FL & LNnT)\(^{19-23}\)
- The lowest protein infant formula in the UK and Ireland\(^{19-23}\)
- Easy to digest (100% whey, partially hydrolysed protein)
- Zinc and Vitamins A, C & D to help support the normal function of baby’s immune system\(^{24,25}\)

**SMA® ADVANCED Follow-on Milk**

From 6 months

- The 1st Follow-on Milk in the UK & Ireland with HMOs* (2’FL & LNnT)\(^{23-30}\)
- Iron to help support normal cognitive development in baby’s brain
- Zinc and Vitamins A, C & D to help support the normal function of baby’s immune system
- Easy to digest (100% whey, partially hydrolysed protein)

**SMA® ADVANCED Growing Up Milk**

From the 12th month onwards

- The 1st Growing up Milk in the UK & Ireland with HMOs* (2’FL & LNnT)\(^{31-35}\)
- Vitamin D and calcium to support the normal growth and development of bones
- Zinc and Vitamins A, C & D to help support the normal function of baby’s immune system

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**How does SMA® ADVANCED First Infant Milk compare?**

| SMA® ADVANCED First Infant Milk* | Aptamil Profutura First Infant Milk
| Contains latest breakthrough in infant nutrition – HMOs* (2’FL & LNnT) | ✓ | ✗ |
| Easy to digest, 100% whey, partially hydrolysed protein | ✓ | ✗ |
| Lowest protein infant formula in UK and Ireland\(^{19-23}\) | ✓ | ✗ |
| Contains DHA (Omega 3) | ✓ | ✓ |
| Nutritionally complete | ✓ | ✓ |

\*HMOs: structurally identical Human Milk Oligosaccharides, not sourced from breast milk.
2’FL: 2’fucosyllactose; LNnT: lacto-N-neotetraose. DHA: docosahexaenoic acid.
SMA Nutrition have been researching HMOs for 30 years

The SMA® ADVANCED range, containing the latest breakthrough in infant nutrition – human milk oligosaccharides – represents our most advanced formulas yet.

REFERENCES:
34. NWHP315 F, NWHP315 G, NWHP315 H.