

Based on the following paper:

Salminen S *et al.* Infant Formula Supplemented with Biotics: Current Knowledge and Future Perspectives. Nutrients 2020, 12, 1952; doi:10.3390/nu12071952

THE IMPORTANCE OF BIOTICS

BREAST MILK IS THE OPTIMAL FORM OF INFANT NUTRITION

IN INFANT NUTRITION

Nutrition in the first 1,000 days (during pregnancy and first 2 years of life) is one of the most crucial factors in infant immune, gut and brain development. As an important step, the World Health Organisation guidelines recommend exclusive breastfeeding for the first 6 months of life and continue up to 2 years and beyond with gradual introduction of safe and suitable complementary feeding.

The unique composition of breast milk – including its oligosaccharides, immune cells, bacteria, and bacterial metabolites – supports infant growth and

development by promoting a healthy gut microbiota which is of significant importance during infancy.

One of the major factors enabling proper gut function and development is a balanced gut microbiota. Several prenatal and perinatal factors including mode of delivery, use of antibiotics, diet, and other environmental factors, including geographic region, may influence the microbial colonisation of the infant and in turn the maturation of the immune system.



# HUMAN MILK OLIGOSACCHARIDES (HMOs)

- PREBIOTIC effect
- Direct effect on immune cells
- infection

  Brain building blocks

Blocking the route of

Impact immune development and supports the development of a healthy gut microbiota



PROBIOTIC and
POSTBIOTIC effects,
for gut and immune
benefits

#### ANTIBODIES AND IMMUNE CELLS

**Direct protection** 

Breast milk is best. For those infants unable to receive breast milk, some formula containing biotics may be suitable.

Biotics are nutritionally active compounds that can, when consumed, confer a health benefit on the host.

### HMOs

#### (Human Milk Oligosaccharides)

Natural prebiotics, the 3rd most abundant solid component in breast milk:

- Approx. 200 different structures exist in a 9:1 short and long chain ratio
- Candidate prebiotics, structurally identical to their counterparts in breast milk
- Today only 2'-FL and LNnT commercially available for addition to infant formula

#### **PROBIOTICS**

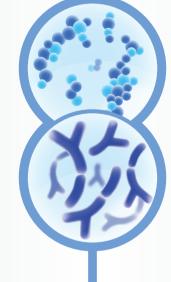
Live microorganisms which when administered in adequate amounts, confer a health benefit to the host

- Specific strains of Lactobacillus and Bifidobacterium are widely used as probiotics
- There is a wide variety of study outcomes on specific probiotics in infant formula, but health benefits are very strain and disease specific
- Certain probiotics can reduce the risk of NEC in premature infants

#### **PREBIOTICS**

A substrate that is selectively utilized by host microorganisms conferring a health benefit

- Specifically designed to closely reflect the quantity, diversity (more than 100 different structures of short- and long-chain types in a ratio of 9:1) and functionality of HMOs in breast milk
- scGOS/lcFOS (9:1), the most studied mixture in formula with proven prebiotic effect\*
- In > 40 clinical studies, scGOS/lcFOS (9:1) has shown positive effects on gut microbiota, the immune system, infection rate reduction and stool softening
- \* as recognised by ISAPP.



## POSTBIOTICS

Postbiotics are a preparation of inanimate microorganisms and/or their components that confers a health benefit on the host

- Most postbiotics derive from Lactobacillus and Bifidobacterium strains, being produced by fermentation. Bifidobacterium breve C50 and Streptococcus thermophilus 065 are the most commonly used bacterial strains and naturally deliver postbiotics
- Postbiotics benefits include gut maturity/ permeability and reduced colic. However, specific benefits will depend on the fermentation process and strains used



#### **SYNBIOTICS**

A mixture comprising live microorganisms and substrate(s) selectively utilized by host microorganisms that confers a health benefit on the host

- A synbiotic mixture of prebiotics (scGOS/lcFOS or scFOS/lcFOS in a ratio of 9:1) and the probiotic strain *Bifidobacterium breve* M-16V showed promising results for infants at high risk of allergy and infants with already developed allergy
- A synbiotic mixture of prebiotic scGOS/lcFOS
   (9:1) and probiotic *Bifidobacterium breve* M-16V compensated for delayed bifidobacteria colonisation and resulted in a lower proportion of potential pathogens (in infants delivered by caeserean section) leading to a significant decrease of atopic dermatitis (AD) score, less asthma-like symptoms and asthma medication use (in infants with AD)

