HUMAN MILK OLIGOSACCHARIDES (HMOs) are the third most abundant solid component of human milk, after lactose and fat.

Macro and micro nutrients, and HMO (5-15g/L)

Water
Lipids (40g/L)
Lactose (70g/L)
Protein (8g/L)

Categories of HMOs (% total)

- Fucosylated (35 - 50%)
- Sialylated (12 - 14%)
- Non - fucosylated neutral (42 - 55%)

2’FL is the most predominant HMO in human milk, accounting for more than 30% of total HMOs

6’SL is the predominant sialyllactose in human milk in beginning of lactation

LntT is one of the 10 most abundant HMOs in human milk

HMOs AND OTHER PREBIOTIC OLIGOSACCHARIDES (PBOS)

PBOs

GLUCOSE TRACES
GALACTOSE +
N-ACETYLGLUCOSAMINE +
FUCOSE +
SIALIC ACID (NEU5AC) +
FRUCTOSE –
XYLOSE +
ARABINOSE +

HMOs VERSUS GOS/FOS

Galactooligosaccharides (GOS)
Fructooligosaccharides (FOS)

Monosaccharide composition of human milk oligosaccharides (HMOs) and prebiotics (PBOs) (A) and examples of specific linkages (B)

REDUCE ADHESION OF PATHOGENS

HMOs act as a decoy, avoiding adhesion of pathogens to the gut barrier.

HMOs also directly affect intestinal epithelial cells and modulate their gene expression, which lead to changes in cell surface glycans and other cell responses.

IMMUNE MODULATOR EFFECT

HMOs modulate lymphocyte cytokine production, potentially leading to a more balanced Th1/Th2 response.

Without HMO

Th1

With HMO

Th2

HMOs, the third solid component of human milk, are complex structures with a high potential for specific functions. No other biological fluid contains such a high variety and structures as human milk.

References: