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From Breast Milk to Bottle: Science and Strategy Behind BENEO and WACKERâ??s HMO Launch

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Olivier Roques, CEO of BENEO

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In a strategic effort to enhance early-life nutrition, BENEO and WACKER have partnered to develop and globally launch 2â??-Fucosyllactose (2â??-FL), the most abundant and well-researched human milk oligosaccharide (HMO). This collaboration combines BENEOâ??s extensive expertise in prebiotics with WACKERâ??s advanced fermentation technology, highlighting their shared commitment to replicating the natural benefits of breast milk in infant and toddler formulas. In an exclusive interview, Olivier Roques, CEO of BENEO, discussed the motivations behind the partnership, the science and technology involved in the production of 2â??-FL, and the broader implications of this innovation for infant health and the global formula market.

What was the primary motivation behind BENEO and WACKERâ??s strategic alliance for the development and global launch of 2â??-FL?

Sharing the same goal is the strong foundation of this partnership between BENEO and WACKER: improving infant and toddler nutrition with high-quality, science-backed ingredients to foster a healthy gut from early on. By bringing together BENEOâ??s expertise in prebiotics and functional food ingredients with WACKERâ??s unique fermentation technology, weâ??re aligning the formula toward the natural composition of breast milk. One of the key outcomes of this collaboration is a reliable and scalable supply of 2â??-FL, the most abundant and well-studied human milk oligosaccharide. And with demand growing worldwide, that kind of solution is more important than ever.

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2. How does 2â??-Fucosyllactose distinguish itself from other HMOs concerning health advantages and applications in infant nutrition?

2â??-Fucosyllactose (2â??-FL) stands out as the most abundant HMO in human milk and is extensively studied for its health benefits. It plays a crucial role in supporting the development of a healthy gut microbiota, which is key to building and maintaining immune function. The collaboration between BENEO and WACKER further enhances the value of infant and toddler nutrition by combining 2â??-FL with chicory-derived inulin-type fructans. Recent research conducted in collaboration with ETH Zurich demonstrated that this combination of prebiotic ingredients can foster the growth of bifidobacteria more effectively than 2â??-FL alone.

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3. Could you provide more details on the production process, especially the significance of WACKERâ??s patented strain and precision fermentation, and how these factors contribute to quality and scalability? *answered by Rachela Mohr, Business Development Manager at WACKER*

One of the key strengths behind our production process is WACKERâ??s patented microbial strain, specifically engineered for high efficiency. Combined with our deep expertise in precision fermentation, this allows us to fine-tune the process for producing exceptionally pure 2â??-FL.

Whatâ??s important here is that this approach doesnâ??t just ensure purityâ??it also guarantees consistent quality, safety, and scalability. Because the fermentation process is so tightly controlled, weâ??re able to produce 2â??-FL efficiently and sustainably, while reliably meeting the stringent quality standards of the global infant formula market.

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4. Considering the increasing demand for HMOs, how will this launch contribute to securing a consistent supply for both large and small infant formula manufacturers across various regions?

At WACKER and BENEO, we focus on supply chains that are both sustainable and resilient. WACKER has over 30 years of experience developing highly effective fermentation processes that meet rigorous quality standards. This includes manufacturing ingredients via sustainable biotechnology for the infant food market. BENEO is a trusted partner in the field of infant and follow-on formula solutions, ensuring high-quality standards for this vulnerable target group.

Both production and commercialization lie in experienced, reliable hands. Additionally, as globally operating companies, we offer tailored supply solutions that work for both international and regional formula manufacturers.

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5. In what ways does the inclusion of 2â??-FL strengthen BENEOâ??s current product range, and are there any forthcoming plans to introduce additional HMOs?

Adding 2â??-FL to our portfolio is a strategic milestone for BENEO. It strengthens our range of science-based prebiotics by complementing our existing chicory root-derived inulin-type fructans. Both ingredients are backed by strong scientific evidence: 2â??-FL is the most abundant and well-researched HMO, and our chicory root fibres are among the very few prebiotics recognized by ISAPP (International Scientific Association for Probiotics and Prebiotics)â??and the only ones that are plant-based.

While breast milk remains the gold standard, combining the two enables us to create advanced prebiotic blends that more closely mimic the composition and natural benefits of breast milk. Thatâ??s incredibly important in early life nutrition, especially for infants who cannot be breastfed. As shown in recent studies, the combination of 2â??-FL and inulin-type fructans supports the development of a healthy gut microbiota, which plays a crucial role from day one.

Development of additional products is ongoing.

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6. Given the growing emphasis on scientifically supported ingredients by consumers and regulatory bodies, what scientific or clinical evidence validates the effectiveness and safety of this 2â??-FL product?

Infant nutrition is one of the most tightly regulated segments in the food industry. Safety and quality are critical for such a vulnerable target group. 2â??-FL meets these high standards and is approved for use in infant formula in the European Union, reflecting the strong scientific and regulatory backing behind it. For other countries where specific pre-market regulatory clearance is required, BENEO and WACKER are actively pursuing the necessary approvals.

Scientific research on individual HMOs began with 2â??-FL, making it the most extensively studied HMO. And the body of research continues to grow. As mentioned earlier, studies confirm that 2â??-FLâ??especially when combined with inulin-type fructansâ??helps promote a beneficial gut microbiota. Thatâ??s a key factor in supporting digestive and immune health in

infants.

Whatâ??s also exciting is that the benefits of this combination extend beyond early life. A 2023 study by Jackson et al. found that a blend of 2â??-FL and inulin-type fructans had a positive impact on mood in healthy adults. The study showed that increasing levels of Bifidobacteria in the gut, through intake of these prebiotics, was linked to noticeable improvements in mood among individuals experiencing mild to moderate anxiety or depression.

So, weâ??re seeing a strong foundation of evidence supporting not just the safety, but also the broader health potential of 2â??-FL and inulin-type fructansâ??not only for infants, but across different life stages.

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