

Probiotic Combination Evidenced to Have Colic, GI Health Benefits in Infants

Through recent clinical research, a formulation of two probiotic strains given by Kaneka Probiotics was shown to provide potential colic and gastrointestinal health advantages in a sample of 34 newborns.

The formulation, which comprises of *Bifidobacterium longum* subsp. *longum* KABP-042 and *Pediococcus pentosaceus* KABP-041 strains, were tested for safety and mechanisms of action in the GI system, including intestinal barrier integrity, according to the company.

Based on the findings of the study, which has been published in *Frontiers in Microbiology*, the researchers linked supplementation with the formulation to significant reductions in the severity of functional gastrointestinal disorders (FGID) such as colic and constipation. Furthermore, the parents of the infants who participated in the research self-reported lower anxiety levels.



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According to Kaneka, one in every two newborns develops FGID within the first six months of life, with colic and functional constipation being the most common symptoms. Given the changes in the gut microbiota of newborns with FGID, experts in the gut microbiome classify FGID as a gut-brain axis condition.

The study, examined the effects of the KABP formulation through multiple investigations including in

silico analyses, in vitro characterization, and an in vivo trial on infants with FGID. Regardless of the feeding mode or delivery mode, the outcomes of supplementing with the KABP formulation were consistent.

Mike Kolifrath from Kaneka said, "The study substantiates the efficacy of Floradapt Baby Colic, our dietary supplement probiotic that is constituted entirely of the KABP formulation. Although Baby Colic is a dietary supplement and is not intended to diagnose, treat, cure, or prevent any disease, this multi-pronged study of the effects of the KABP formulation adds another layer of support to the existing competent and reliable scientific evidence that Baby Colic supports a calm gut and healthy microflora in babies and helps reduce the duration of crying episodes and crying time. Kaneka's robust presence in infant probiotic nutrition has again been proven."

Tocotrienols seems to offer benefit in *in vitro* model of Alzheimer's

According to a study recently published in *Biochemistry and Biophysics Reports*, different vitamin E analogs show unique effects on a number of markers of Alzheimer's disease (AD) progression in human cells in *in vitro* settings.

The researchers looked at the role of two types of vitamin E, alpha- and gamma-tocotrienol, as well as alpha-tocopherol (a common form of vitamin E



found in many dietary supplements) in two markers of Alzheimer's disease: beta-amyloid aggregation and tau protein hyperphosphorylation to form neurofibrillary tangles in neurons. Each of these signs has been linked to the progressive disease's neurodegeneration, memory impairment, and final cognitive loss, reported Nutraceuticals world.

A team of researchers from Japan's Shiga University of Medical Science and Showa School of Medicine looked at the effects of three different forms of vitamin E at different concentrations on beta-amyloid aggregation, specifically looking at A β 42 fibrils (the major component of amyloid plaques in Alzheimer's disease brains).

The two tocotrienols considerably decreased beta-amyloid aggregation at a relatively low concentration of 10 μ M, however the alpha-tocopherol component did not. At low concentrations, both forms of tocotrienols were able to considerably disaggregate pre-

viously produced A β 42 fibrils, but alpha-tocopherol did not.

This backed up previous findings that suggested gamma-tocotrienol has the broadest beneficial effects because it reduces beta-amyloid aggregation, disaggregates preformed fibrils, and reduces beta-amyloid oligomerization, all of which, according to the authors, leads to improved neuronal functions and improved cognitive performance.

"There is a rapid growth in the number of people suffering from Alzheimer's disease throughout the world, and it's the most frequent cause of dementia

in Western societies. It's important to find ways such as supplementation of tocotrienols to mitigate the progression of AD, especially at its early stage. This current research is the first to reveal that specific tocotrienol analogues such as [alpha-tocotrienol] and [gamma-tocotrienol] have a direct effect on [beta-amyloid] aggregation and fibril formation. The findings shed light on tocotrienols' possible relevance in the development of potential therapeutic agents for AD," said Dr. Ariati Aris, scientific affairs specialist at PhytoGaia, an ingredient supplier specializing in tocotrienol ingredients.

Widely used food additive affects the human gut microbiota

An additive used in processed food leads to changes in our gut bacteria, according to new research from NMBU. Researchers say it is time for new assessments of additives used in foodstuffs.

The food additive E415 also known as xanthan gum is used in everyday foods such as baked goods, ice cream and salad dressings. The additive is also widely used as a substitute for gluten in gluten-free foods. New research now shows that xanthan gum affects our gut microbiota. The study was recently published in *Nature Microbiology* by a team of scientists at NMBU in collaboration with the University of Michigan and several other international partners.

The new study shows that the additive nevertheless affects the bacteria that live in our intestines. The gut bacteria we have investigated show genetic changes and a rapid adaptation to enable them to digest this particular additive," explains professor Phil Pope.

The study shows that the ability to digest xanthan gum is surprisingly common in the human gut microbiota in the industrialized world and appears to depend on the activity of a single bacterium that is a member of the family *Ruminococcaceae*.



Together with postdoc Matthew Ostrowski and professor Eric C. Martens, both from the University of Michigan, the NMBU-scientists have used several different methods that analyze genes, transcripts, proteins and enzymes produced by the gut bacteria, to uncover how this single bacterial species digests xanthan gum. The work includes laboratory testing of stool samples from many human donors, mouse experiments and data from large international databases of microbial genes.

In some samples, another type of microbe was also found that interacted with the xanthan gum, this one in the species *Bacteroides intestinalis*. This bacterium could hijack and further break down small pieces of xanthan gum created during the digestion of the larger xanthan molecules by the *Ruminococcaceae* bacterium. The *Bacteroides* bacterium was equipped with its own special enzymes that allowed it to eat these small xanthan gum fragments.

The study demonstrates the ex-

istence of a potential xanthan gum-driven food chain involving at least two types of gut bacteria. It provides an initial framework to understand how widespread consumption of a recently introduced food additive influences the human gut microbiota.

"The methodologies used in this study are certainly pushing boundaries and enable us to really deconstruct microbiomes to answer important biological questions that have societal relevance. These approaches have been made possible by the extensive competences in microbiome research at NMBU including multi-omics (at the Microbial Ecology and Meta-Omics group) and enzymology (at the Protein Engineering and Proteomics Group)," says Pope.

Xanthan gum is approved as safe to use in foodstuffs in large parts of the world, based on assessments made fifty years ago. The low, but constant consumption of xanthan gum by a large fraction of the population in the industrialized world, and its higher intake by specific subgroups such as those with gluten intolerance, highlight the need to better understand the effects of this food additive on the ecology of the human gut microbiota and on overall host health.

Capsule with phytochemicals can improve Long Covid recovery

A group of nutritional experts led by an Addenbrooke's oncologist has created a capsule that uses the capabilities of natural substances to help people with lengthy Covid recover faster. Professor Robert Thomas' research found that giving the stomach a combination of five distinct friendly bacteria termed lactobacillus probiotics, together with inulin, improved symptoms.

Professor Thomas discovered that a capsule containing a combination of other natural elements known as phytochemicals might greatly aid further in another study published in the international journal Covid.

Purified citrus bioflavonoids, a wide family of vitamin C-rich chemicals present in most meals, resveratrol, a plant molecule that serves as an antioxidant, pomegranate, chamomile, and turmeric are among the ingredients in the new capsules.

Professor Thomas' team gathered 147 research par-



ticipants, 25% of whom had acute Covid and 75% had chronic long Covid, with symptoms lasting an average of 108 days. They were all given a dried lactobacillus probiotic capsule, with half of them also receiving a phytochemical-rich concentrated meal capsule and the other half receiving a placebo capsule. The data, as anal-

ysed by the University of Bedfordshire, indicated that the entire group's symptoms improved dramatically. Furthermore, as compared to those who received the placebo, those who took the phytochemical-rich meal capsule improved much more.

Furthermore, a subanalysis of the participants' demographics found that those who were more likely to have a pre-existing gastrointestinal problem responded to the intervention even better. Those with gastrointestinal complaints, sedentary, elderly males, or those who had already been hospitalised were also included.

HMO levels in breast milk may be fundamental to develop next-gen infant formula

The largest data collection to date demonstrates the vast range of natural human milk oligosaccharide (HMO) contents and verifies the safety of ingestion even at high quantities.

HMOs, which are essential types of carbohydrates found in human breast milk, may be released in extremely high amounts and yet be safe and well accepted by newborns in some situations.

According to a study by Chr. Hansen, which compiled data from hundreds of observational peer-reviewed researches for the five most common HMOs in breast milk, the acceptable and safe quantities of HMO supplementation in infant formula can be found.

The review has been published in Food and Chemical Toxicology and is the largest data set analyzed to date, reports MyNewsdesk.

This review determines the natural concentrations of HMOs, whereas previous research concentrated on quantifying HMOs in human milk. The concentration levels differ based on the mother's health and genetics, as well as environmental and regional variables, and gestational age (pregnancy advancement) and breastfeeding stage. The goal of the current study was to get a better understanding of natural HMO concentrations and distribution in breast milk, which is crucial for developing next-generation infant formula products with HMO compositions that are more similar to breast milk.

"Breastfeeding is the best way to ensure infant health as recommended by WHO. At Chr. Hansen, we further aim to support the healthy development of infants that cannot be breastfed by providing HMOs as an

ingredient and blend for infant formula," says Jesper Sig Mathiasen, senior vice president, Chr. Hansen HMO.

"The study presents important statistical data to help support the level of appropriate HMO supplementation in infant formula and confirms the safety of intake at concentrations higher than average. We see it as yet another testimony to our HMO offering," he added.

The study concluded that out of over 150 HMOs identified in human breast milk, the five most prevalent and best studied HMOs are 2'-fucosyllactose (2'-FL), 3-fucosyllactose (3-FL), Lacto-N-tetraose (LNT), 3'-sialyllactose (3'-SL), and 6'-sialyllactose (6'-SL). "Infants fed infant formula containing the 5HMO-Mix demonstrated similar digestive parameters and stooling patterns as breastfed infants," it further added.