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foreword

Editor's note

By Charles Faulkner

With Covid-19, the Nutraceutical supply chain has experienced uncertainty. However, opportunities continue to arise for sourcing and purchasing new products & services, hearing about the latest R&D, talking with existing suppliers, keeping up-to-date with industry trends, learning about the benefits of specific products & ingredients, and concluding deals. In 2021, healthy ageing & immunity will lead current topics of interest with a focus on Probiotics, Plant extracts, Botanicals

and Vitamins, with an increased interest in safety equipment, packaging & clothing to protect against corona virus infection. We will maintain communications with leading companies and personnel from Dietary / Health supplements manufacturers, Contract manufacturers, Food / Beverage manufacturers, and Pharmaceutical product manufacturers from leading companies in Europe and north America.

Wishing everyone a prosperous and safe 2021. ●

6 Issues, titled by months.

FEBRUARY/MARCH: Omegas, Botanicals,
Post Covid 19, News.

COPY DATE: 14th February 2021

APRIL/MAY: Immunity, Supplements,
Probiotics, Encapsulation, Vitafoods
Europe Preview.

COPY DATE: 6TH APRIL 2021

JUNE/JULY: Flavours, Plant Proteins,
Sugar Reduction. IFT Preview.

COPY DATE: 17TH JUNE 2021

AUGUST/SEPTEMBER: Sports Nutrition,
Nutricosmetics, Skin Health, Woman's
Health, Asia-Pacific Events.

COPY DATE: 6TH AUGUST 2021

OCTOBER: Dietary Supplements,
Vitamins, Fruit Extracts, Anti-Aging,
SSW Preview.

COPY DATE: 2ND OCTOBER 2021

NOVEMBER/DECEMBER: Cognitive Health,
Bone Health, Collagen, Cocoa, Dietary
Fibres. Fi/Hi Europe Preview.

COPY DATE: 5TH NOVEMBER 2021



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Nutraceuticals Now is a technical review providing the latest information on functional products and ingredients which are defined as having a disease preventing and/or health promoting benefit in addition to their nutritional value.

It is targeted at manufacturers of food and drink, who are producing finished products aimed at the ever increasingly health conscious consumer.

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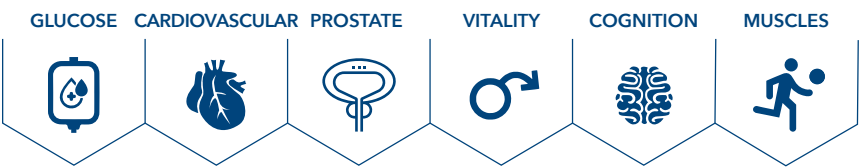
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I'm very pleased to welcome you to our company news, which reports on recent developments in the Global Nutraceutical supply chain.

Recent data suggest a strong rebound in activity generally in line with

previous expectations, although the level of activity remains well below the levels prevailing before the coronavirus (COVID-19) pandemic. While activity in the manufacturing sector has continued to improve, momentum in the services

and events sector has slowed dramatically. The strength of the recovery remains surrounded by significant uncertainty, as it continues to be highly dependent on the future evolution of the pandemic and the success of containment policies.

GELITA also supports major sporting event in Corona year

Numerous running events have been cancelled this year due to the Corona pandemic. GELITA, one of the leading manufacturers of collagen proteins, has decided to continue its involvement in sports, particularly in this situation.

"As a supplier of collagen peptides, which among other things help to keep bones and joints mobile and healthy, we have a strong affinity to the topic of sport," explains Michael Teppner, Global Vice President Marketing and Communication at GELITA. Within the scope of its corporate social responsibility activities, the company has been supporting the GELITA Trail Marathon in Heidelberg, near the company's headquarters in Eberbach, since 2016. The track is particularly popular with both professional and amateur athletes because of its demanding and attractive route.

Thanks to GELITA's support, it was possible to hold the running event successfully at the beginning of October - even under this year's exceptional circumstances. "We are delighted that our commitment has once again played a role in inspiring people to take up special



Happily crossing the finish line after 42 kilometers: The winner of the Trail Marathon course Merle Brunnée (Engelhorn sports team). Source: PIX-Sportfotos

sporting challenges," says Teppner. After so many sporting events had to be cancelled in recent months, the rush for a starting place in the Trail Marathon showed how important the competition is for many people. "In

line with our principle 'Improving Quality of Life', we evidently hit the bull's eye and managed to delight numerous sports enthusiasts in these difficult times," Teppner explains.

New Cognitive Human Clinical Trial on Tocotrienol + Astaxanthin Synergistic Formula



BGG World (BGG) announces that a new clinical trial¹ was successfully completed and published on a synergistic combination of TheraPrimE® Palm Tocotrienols and AstaZine® Natural Astaxanthin showing cognitive improvements in subjects with age-related memory decline. The randomized, double-blind, placebo-controlled

study was done on 44 subjects over 12 weeks using a combination of 50mg of TheraPrimE® Palm Tocotrienols and 9mg of AstaZine® Natural Astaxanthin. Statistically significant results versus placebo were found using the Cognitrix cognitive test to measure composite memory domain as well as by subjective user evaluation.

Lead author Takahiro Sekikawa, PhD, commented, "We previously demonstrated that AstaZine® Natural Astaxanthin alone was able to markedly ameliorate how well subjects can recognize, remember, and retrieve words and geometric figures.² In this study we decided to add 50mg of tocotrienols to the same dosage of Astaxanthin previously tested and we were able to show a statistically significant amelioration versus the placebo group on Cognitrix in addition to improvement in all subjective symptoms measured. Previous research has established

synergistic antioxidant performance of a Tocotrienol + Astaxanthin blend, and it would be of great interest to investigate in future studies if this outcome is due to an ameliorated absorption of Astaxanthin or perhaps to increased antioxidant activity due to the addition of tocotrienols."

1. Sekikawa, T., Kizawa, Y., Li, Y., Takara, T. "Cognitive function improvement with astaxanthin and tocotrienol intake: a randomized, double-blind, placebo-controlled study." *Journal of Clinical Biochemistry and Nutrition* 19 June 2020 1-10.
2. Sekikawa, T., Kizawa, Y., Li, Y., Takara, T. "Cognitive Function Improvement with Astaxanthin Intake: A Randomized, Double-Blind, Placebo-Controlled Study." *Pharmacometrics* 97 (1/2) 1-13 (2019).

Further Information on BGG: www.bggworld.com

Gnosis by Lesaffre Fully Merges Human Health Capabilities

Gnosis by Lesaffre is striving to create a world that moves better, digests better, ages better, feels better, and, ultimately, lives better thanks to microorganisms and biotransformation. Earlier this month, Gnosis by Lesaffre unveiled its new, fully integrated brand and business strategy to help make this vision a reality.

Gnosis by Lesaffre, a business unit of the Lesaffre Group, harnesses the power of microorganisms and biotransformation processes like fermentation to cultivate nutritional actives, probiotics, and nutritional and functional yeasts that benefit human health and wellbeing. The business unit collaborates with dietary supplement, functional food and beverage, and pharmaceutical brands to develop game-changing products for their customers.

"The term 'biotransformation' may be unfamiliar to some in the industry, but it refers to fermentation and other natural processing methods that involve transforming compounds within a living system," General Manager Marc Philouze said. "It describes exactly what we do. We use living microorganisms to transform compounds into usable nutritional actives."

The business unit draws on its focused research and applications capabilities, rigorous quality and regulatory

compliance, and extensive clinical validation procedures to develop effective solutions for its key markets: Wellness & Immune Health, Digestion & Gut Health, Mobility & Joint Health, Reproduction & Women's Health, and Mood & Cognitive Health.

"In the past, we have focused solely on building awareness for our renowned ingredients, such as Quatrefolic® and Lyside® nutritional yeasts," Global Marketing Director Philippe Caillat said. "At the same time, we have been building our expertise and market leadership for our key market segments, so we are proud to bring those to the forefront of our brand strategy."

Within its market segments, Gnosis by Lesaffre has developed a portfolio of solutions that improve health and wellbeing throughout the entire body:

- Wellness & Immune Health: Immunity, Daily Nutrition, Cardiovascular Health, Beauty, and General Wellbeing
- Digestion & Gut Health: Microbiome Balance, Digestive Comfort, Liver Health Support
- Mobility & Joint Health: Bone Health, Joint Health, Muscle Health, and Sports Nutrition
- Reproduction & Women's Health: Vaginal Care, Urinary Health, Fertility, Pregnancy, and Menopause
- Mood & Cognitive Health: Mood Health, Cognition, and Stress & Anxiety



Urinary Health, Fertility, Pregnancy, and Menopause

- Mood & Cognitive Health: Mood Health, Cognition, and Stress & Anxiety

Quimdis GmbH distributes the range DHA ORIGINS® of Fermentalg in Germany, a premium plant-based DHA

Fermentalg has decided to entrust Quimdis GmbH with the distribution of its range of Omega 3, with a naturally highly concentrated DHA from microalgae as of September 1, 2020 in German market.

This collaboration completes the range of products offered by the Quimdis dietary sector, whose commercial, technical and regulatory teams remain at your entire disposal for any project.

Fermentalg SA, an industrial biotechnology firm, aims to meet high expectations from consumers, laboratories and dietary supplement manufacturers, meets the nutritional requirements in the agri-food industry, by supplying natural microalgae health products. The company was founded in 2009 and is headquartered in Libourne, France. Fermentalg manufactures high quality vegan DHA oils based on their expertise in bio-industrial production of microalgae.

Fermentalg's mission is to provide health and nutrition industry leaders with new sources of oils, natural pigments and proteins by harnessing the vast potential



of microalgae. Fermentalg is specialized in R&D, industrialization and exploitation of microalgae, through fermentation, for the bio-production of molecules or biomasses with nutritional benefits and the potential for a positive impact on health. The technology developed together with the wealth of its bank of strains allows it to target highly varied markets with high value for human nutrition, animal feed as well as health industry.

DHA ORIGINS® range will be perfectly suited your range developments of dietary supplements, beverages and health foods. All products are compliant with US & EU regulations and have trusted process according to quality standards

(ISO certification and GOED Monograph).

Its expertise includes fully traceable supply chain combined with controlled, sustainable and gentle process thereby offering global clients a high purity and quality Omega-3.

Mr. Jean-Francois Quarre, President & Chairman of Quimdis said "Adding Fermentalg to our list of approved principles is another important value addition to the strong list of suppliers and also increases our product portfolio with high quality branded products. With the technical expertise and an outstanding knowledge of the German market, Dr. Ajax Mohamed who is heading the German office shall be able to promote Fermentalg products very well "

Mr. Jean-Louis Caradec Sales Director of Fermentalg said, "We are convinced that Quimdis, thanks to its strong distribution network, infrastructure and technical capabilities, will be able to promote our DHA ORIGINS® range on the German territory and offer its customers a superior satisfaction".



The FDA's new qualified health claim for whole fruit cranberry supplements causes tremendous excitement



Fruit d'Or says the FDA's acknowledgment of the need for soluble and insoluble PACs could push cranberry ingredients over \$100 million in sales.

The FDA authorized three wording options including, "Limited scientific evidence shows that by consuming 500 mg each day of cranberry dietary supplement, healthy women who have had a urinary tract infection (UTI) may reduce their risk of recurrent UTI."

This news is expected to trigger even more products and innovations within the already popular cranberry supplement industry. In 2019, cranberry ranked #5 in U.S. sales by the American Botanical Council.

Demand increases for Fruit d'Or Nutraceuticals' Cran Naturelle and Cran d'Or. "Fruit d'Or, a farm-to-finish company, is one of the primary beneficiaries of this great news. More companies are calling us looking to formulate with whole fruit cranberry powder because no one else has

our level of expertise," acknowledges Jean Leclerc, director of Sales and Business Development for Fruit d'Or, which is the world's largest grower of certified organic cranberries.

"With this ruling, the FDA is raising the bar by recognizing whole fruit powder for both its soluble and insoluble proanthocyanins (PACs). We've done all the heavy lifting in this area, and companies are eager to learn how these soluble and insoluble PACs work together."

Some companies will need to revisit their formulations

"The FDA's qualified health claim is confirmation that not all cranberry is the same. It's not the components of the fruit ... it's not just the juice ... it's the whole fruit. And products must have a 500 mg daily dose of actual cranberry to make this claim," explains Leclerc.

He adds, "A sprinkle of cranberry does not constitute efficacy. All companies will need to revise their formulations and decide if they want to participate in this claim. We have always believed in the whole spectrum of the cranberry. This is what drove Fruit d'Or to set the industry standards for proper cultivation and handling processes, and to pioneer proper fingerprinting to ensure that formulas contain actual cranberry."

How to reach the top even faster

Leclerc acknowledges that it is possible to use the quali-

fied health claim without demonstrating efficacy. "We still have to fight that battle. Clearly, those who want to differentiate themselves will also want to promote their cranberries' anti-adhesion activity, standardization, purity, potency and quantifying the amount of soluble and insoluble PACs. Fruit d'Or is a pioneer and leader in each of those areas."

Anti-adhesion assays by Rutgers University have shown that cranberry PACs may inhibit pathogenic E. coli's ability to adhere to epithelial cells in the urinary tract. Additionally, work conducted by Complete Phytochemical Solutions using Fruit d'Or Cran Naturelle, captured electron microscopic images of that specific cranberry ingredient's PACs bound to pathogenic E. coli that showed how the anti-adhesion works.

Fruit d'Or is having its premium branded ingredients, organic Cran Naturelle and conventional Cran d'Or, tested by Amy B. Howell, Ph.D. and her team at Rutgers University for this anti-adhesion activity. This testing is more than the current gold standard for confirming efficacy. It will also help further advance cranberry research and science by relating structure to function.

Leclerc explains that the FDA qualified health claim will also open the door for companies that want to create cranberry capsules with no fillers or lubricating agents. "So far, Fruit d'Or is the only company that can provide this level of seed-to-table purity."

KSM-66 Ashwagandha Root Extract shown to enhance the quality of sleep in a randomized, double blind, placebo controlled study

A clinical study published in the Journal of Ethnopharmacology, (<https://doi.org/10.1016/j.jep.2020.113276>) demonstrated that an 8-week supplementation of KSM-66 Ashwagandha root extract led to significant improvement in sleep quality parameters in both healthy and insomnia participants. The study used a sample size of 80 in a double-blind, randomized, placebo-controlled, parallel-group, stratified, comparative clinical study. Participants taking KSM-66 Ashwagandha root extract had improved measures of sleep onset latency, sleep efficiency, total sleep time and waking after sleep onset.

Ashwagandha root extract is long known for its potential in helping sleep quality. Even the herb's botanical name,



"withania somnifera" is indicative of this important benefit. This is the fourth clinical study that has demonstrated the effect of KSM-66 Ashwagandha in enhancing the sleep quality. A previous study published in Cureus (<https://doi.org/10.7759/cureus.5797>) in 2019 showed that KSM-66 Ashwagandha significantly improves sleep efficiency, total sleep time, mental alertness on rising, and sleep quality in healthy adults.

Kartikaya Baldwa, CEO of Ixoreal Biomed Inc, the

marketer of KSM-66, said: "Sleep is critical to be healthy, to recover from exercise and to function optimally both physically and cognitively. Ashwagandha root has been referenced for centuries for its sleep benefits. This study is the first clinical study to evaluate the effect of Ashwagandha root extract on sleep quality in both healthy adults and insomnia patients and demonstrate significant positive effects on sleep quality in the participants." He added, "The paper is published in a prestigious journal and is a valuable contribution to the scientific literature. It substantiates the use of Ashwagandha root extract as an adaptogen that helps reduce anxiety and promote restful sleep."

New study suggests vitamin K deficiency as the missing link in COVID-19 pathogenesis



The review, published in the British Journal of Nutrition, presents vitamin K metabolism as the potential missing link between lung damage and thromboembolism, two of the most serious outcomes observed in COVID-19 patients.

"Considering that vitamin K is important for regulating lung health and blood clotting, vitamin K deficiency during COVID-19 may make both those problems worse," explain Dr. Rob Janssen and Jona Walk, Researchers at the Canisius Wilhelmina Hospital (Nijmegen, The Netherlands), and lead authors of the study.

The "triage theory" implies that, because vitamin K1 is preferentially transported to the liver, carboxylation grades are higher in hepatic coagulation factors

than in extra-hepatic proteins. Yet, these extrahepatic proteins play a decisive role during COVID-19 infection. Insufficient activation of protein S in blood vessel walls and matrix Gla protein (MGP) in the lungs may lead to an increased risk for thrombosis, and lung damage, respectively.

"Because of their structural differences, vitamins K1 and K2 do not have the same biological activities. With K2, the role of vitamin K extends beyond blood clotting, as it also regulates other important metabolic processes, such as calcification and inflammation. K1 is easily found in a balanced diet, which is not the case for K2. Deficiency might be more common than we think," says Dr. Trygve Bergeland, VP Science at Kappa Bioscience, who supported the research.

The review also highlights the important link between vitamin D3 and vitamin K2. Vitamin D administration, which is part of certain clinical trials protocols

for COVID-19, may induce short-term hypercalcemia, resulting in an accelerated elastic fiber calcification, and degradation. "Vitamin D administration in a state of vitamin K deficiency may thereby endanger pulmonary and vascular health", notes Janssen.

"There is a need for further experimental evidence to link vitamin K deficiency with the pathology of COVID-19 and determine whether vitamin K2 supplementation has a place in treatment protocols. The potential role of vitamin K2 supplementation to prevent development of severe COVID-19 in subjects who have not yet contracted COVID-19, but are at risk for the infection, is also very relevant to assess," Janssen and Walk conclude.

Kappa Bioscience, who supported this study, is entering research agreements with several research centres, both in Europe and in the US. The company aims to support research to generate a better understanding around vitamin K2 deficiency and COVID-19 pathogenesis.

Lonza Launches First Probiotic Ingredient for Sports Nutrition: TWK10® brand

Lonza announces the launch of its new TWK10® ingredient, a unique Lactobacillus plantarum probiotic strain isolated from naturally fermented Taiwanese Kimchi. The first probiotic ingredient to deliver sports nutrition benefits for both elite athletes and active consumers, TWK10® brand is clinically shown to enhance endurance, improve body composition and energy levels. Licensed exclusively from Synbiotech for North America and Europe, the clean label, vegan ingredient can be used in dietary supplements and in foods, with additional applications already in development. TWK10® probiotic is available now in North America.

Dr. Thomas Kiy, Vice President Strategy and Portfolio Development at Lonza Capsules & Health Ingredients, comments: "At Lonza, we continue to look for and develop science-backed ingredients to help brands create cleaner, more effective products that active consumers demand. TWK10® probiotic is a world-first for the sports nutrition market, and a true innovation."

"Isolated from fermented vegetables, specifically Taiwanese Kimchi, the unique patented TWK10® strain is the next generation of probiotics. It is scientifically proven to effectively modulate gut microbiota for sports endurance and performance benefits. TWK10® vegan probiotic also appears to support increased butyrate-producing bacteria in the gut for a positive increase on energy metabolism," continues Kiy.



Mr. Kuei-Ming Lee, Vice President of Human Healthcare of Synbiotech adds: "Fermented dairy products with active bacterial cultures are the typical source of many probiotics currently on the market. However, our extensive research exploring over 300 plant-derived probiotic strains revealed a unique strain with excellent survival rates. Currently two human clinical trials have been completed on TWK10® probiotic, and studies have shown that it delivers significant benefits for fitness enthusiasts and active individuals, including increasing muscle endurance."

Any athlete, any person, every advantage

Suitable for elite athletes, so-called "weekend warriors", and active individuals alike, TWK10® probiotic helps improve athletic performance through greater energy harvesting. By enhancing muscle endurance, TWK10® probiotic allows consumers to train for longer. Derived from vegetables, TWK10® probiotic also enables brands to meet the increased consumer preference for vegan, plant-based sports nutrition products.

TWK10® probiotic is the latest addition to Lonza's growing clean-label sport nutrition ingredient portfolio. The vegan MuscleGuard™ formulation comprises a unique blend of ingredients to offer clinically significant benefits for muscle strength, mass and activity. A sustainably-sourced phytoplankton ingredient, Oceanix™ brand offers clinically-studied benefits for sustained strength and power, and short-term recovery. Carnipure® L-carnitine delivers both exercise and muscle recovery benefits. While UC-II® undenatured type II collagen improves joint health to further support active lifestyles.

The new TWK10® ingredient will officially be unveiled at Lonza's Virtual Innovation Day on October 1, 2020 — interested parties can email vaughn.dubow@lonza.com for more information or to request a sample.

WHAT YOU DON'T KNOW ABOUT LABEL CLAIMS IS AS IMPORTANT AS WHAT YOU DO

NSF International asked its consultants to share the biggest struggles they've seen companies have with claims substantiation. Here are the most common aspects that can cause confusion and harm brand reputation.

When It Comes to Claims, There's More Than Meets the Eye – A Lot More

Manufacturers don't always grasp the complexity, technicality or scope of information for substantiating claims. There are numerous categories of claims, and each category can have its own individualized requirements and requirement latitude. The requirements around claims are varied and depend on the type of claim. Categories include:

Nutrient content claims:

- Directly or indirectly characterize the level of a nutrient
- Must be permitted by a regulation in order to be used

Health claims:

- Describe the relationship between a nutrient and risk reduction of a disease or health-related condition
- Must be permitted by a regulation in order to be used

Consumer value claims (label claims of consumer concern):

- Natural
- Organic
- Non-GMO
- Allergen claims such as gluten-free and dairy free
- Keto, paleo, vegetarian and vegan

Structure/function claims that convey:

- The role of a nutrient or dietary ingredient intended to affect normal structure or function in humans
- How a nutrient or dietary ingredient acts to maintain structure/function, for example "antioxidants maintain cell integrity"
- General well-being from consumption of a nutrient or dietary ingredient
- A benefit related to a nutrient deficiency

cy disease (like vitamin C and scurvy), as long as the statement also tells how widespread such a disease is in the U.S.; otherwise, it may NOT describe a relationship with a disease

These categories can contain subcategories, each with its own requirements. Here's an example of both claim specificity and latitude, in the category of nutrient content claims:

Specificity: There are requirements about the specific words a manufacturer may use, particularly around quantifiable claims such as "high in," "rich in" and "contains." Saying "low" is not the same as saying "less," but saying "reduced" is the same as saying "less."

Latitude: While the words themselves are closely watched, the format of those words is often given a great deal of leeway. A claim may be presented in a font size or style on the label which is more than twice as prominent as the rest of the product's identity style.

Study Details Matter

When building a case to substantiate health claims, the study details matter. Both the U.S. Food and Drug Administration (FDA) and the Federal Trade Commission (FTC) apply a claim substantiation standard of "competent and reliable scientific evidence." They look at the meaning of the claim being made, with an eye toward:

- The relationship of the evidence to the claim
- The quality of the evidence
- The totality of the evidence

FDA and FTC closely scrutinize the studies being used to support the claim. Is the study test substance the same as the product dietary ingredient? Is the form the same (e.g. extract vs. powder)? If it is a botanical, is the part of the plant the same? Is the dosage in the study similar to or conservative when compared to the serving size of the product? What about the length of exposure of the study



test subjects vs. the recommended use of the product? Are there any other ingredients present in the study that could have contributed to the effect?

FTC Requirements Are Just as Important as FDA Requirements

Companies often focus primarily on FDA regulatory compliance, while not paying enough attention to FTC requirements around claims. But even the highest quality product cannot reach the market if it does not comply with the business law of the land. The FDA's focus is on manufacturing and labeling. The FTC enforces laws against "unfair or deceptive acts or practices" in advertising. Law enforcement action applies not only to product labels, but also to internet, print, broadcast, infomercials and catalogs. The lines between the jurisdiction of each agency are not black and white, and they often collaborate on the same case against a company. FTC enforcement actions can have a devastating impact on ad agencies, distributors, retailers, catalog companies and infomercial producers. Unlike your facility, your advertising and social media is public-facing and accessible. Complaints filed with the Better Business Bureau can make their way to the FTC. Warning letters are only one mechanism for action. FTC action can also involve lawsuits, frozen assets, burdensome nonnegotiable settlement demands and court orders. As the FTC has said, "Generally, products related to consumer health or safety require a relatively high level of substantiation." ●



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ROSELLA: HER ALLY FOR A HEALTHY INTIMATE FLORA

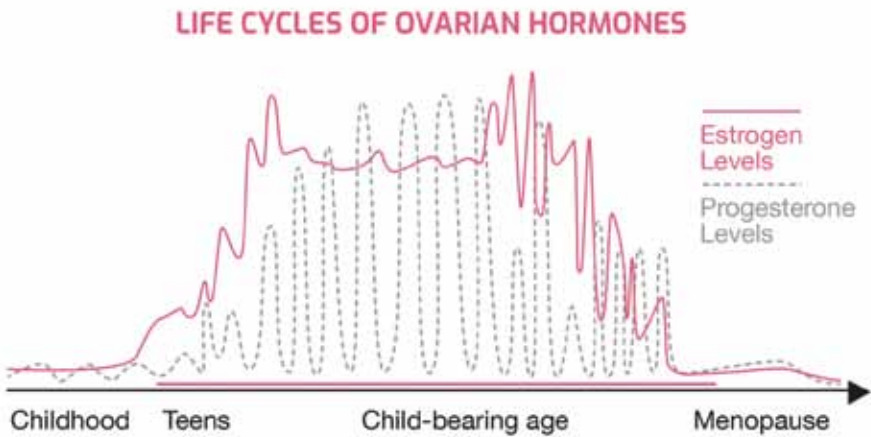
A convenient orally administered probiotic shown to support women’s intimate health

Probiotics for women’s health

Over the past five years, the market for nutritional ingredients for women’s health carried on evolving to a more mature market, driven by consumers’ interest and research and development. With robust scientific backing and product development on the rise, global probiotic markets have been, in fact, growing fast for more than a decade. Lumina Intelligence confirms products have diversified from initial cores of gastro-intestinal health and immunity to a much broader range of benefits including skin, sports performance, brain health and more female-focused areas like vaginal health, urinary tract infections (UTIs), pregnancy and osteoporosis. Probiotics research and development is undeniably popular, with over 1600 ongoing human clinical trials on probiotics listed in clinicaltrials.gov and WHO’s trial database.

According to Grand View Research, the women’s health and beauty supplement market has reached \$49.8 Billion in 2019 and the estimated compound annual growth rate (CAGR) for 2020- 2026 is 4.75%. The probiotics for women’s health core growth areas are: vaginal health, urinary tract infections, pregnancy and skin health. Among non-supplement women users, 40% of them think their « feminine health issues » could be improved by using supplements.

Probiotics for women’s health is a fast-growing market, increasingly attracting women through online and on-site retail places. Although women’s probiotic market used to be a niche market, it is now becoming a strong differentiation



factor for product development, explaining why, since the past two years, a lot of new probiotic products target women, and consequently consumers online engagement is increasing: between December 2017 and January 2020 the number of reviews for women’s intimate health probiotics increased by 804%, on average from the 20 countries studied. Specific probiotics are gaining attrac-

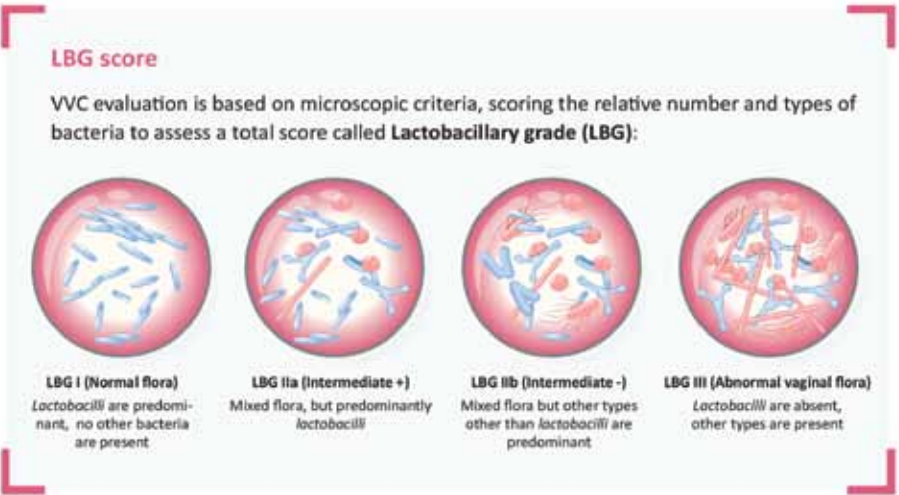
tion as they are a natural alternative to the conventional over-the-counter solutions for vaginal health. Women are willing to try them out especially when vaginal health conditions are recurrent, which alters general quality of life.

Probiotics for women’s health is a major opportunity to expand brand portfolios with a potential target audience of over

1.4 billion women. Genito-urinary issues, including vulvovaginal candidiasis, urinary tract infections and bacterial vaginosis are the leading conditions, bringing women to seek out medical advices, prescriptive drugs and to investigate natural efficient complementary supplements, such as probiotics.

Lactobacilli: The gatekeepers of feminine health

The female vaginal microflora is a rich and complex ecosystem, mainly consisting of Lactobacilli which support the vaginal environment and health. During her lifespan, every woman encounters specific health and well-being issues according to her lifestyle, physiology, hormonal cycles and life stages. Vaginal balance is fragile, and many internal or external factors can affect this balance: gut health, immunity, mood balance, oral health, intimate health... they all have been linked by scientists to endogenous microbiota. Acting upon the gut or vaginal microbiota, specific probiotics can help each individual woman at every stage of her life, from puberty to menopause. The benefits of probiotics to support women’s health are increasingly recognised, mainly due to their ability to maintain and restore digestive and vaginal microflora balance, with positive consequences on feminine health as well as on digestive health, occasional stress or natural defenses. As per most of the beneficial effects of probiotics, the benefits on intimate health are not homogeneous for all the probiotics but are strain specific.



WHAT IS THE DIFFERENCE BETWEEN BACTERIAL VAGINOSIS AND VAGINAL YEAST INFECTION?

Bacterial vaginosis is defined as a vaginal dysbiosis characterized by a decrease in concentration of Lactobacilli in the vagina and an increase in concentration of anaerobic bacteria such as Gardnerella vaginalis, Atopobium vaginae, Mycoplasma hominis, Prevotella, Porphyromonas. It is the most common vaginal infection in women of child-bearing age.

Vaginal yeast infection is also due to an imbalance in the vaginal flora. In this condition, the problem is a fungus called Candida, such as Candida albicans, which incapacitates commensal bacteria. Candida albicans are also often found in the gastrointestinal tract, as part of a commensal bacteria. Candida can co-exist normally in the vagina without any problem, and a proper Candida albicans balance is an indicator of healthy vaginal microbiota. However, it may cause trouble if it outnumbers other microorganisms. Three out of four women will have an imbalance with a Candida albicans prominent microflora at some point in their life.

HOW TO PROBIOTICS PROMOTE VAGINAL HEALTH, EVEN DURING TIMES OF OCCASIONAL BACTERIAL IMBALANCE

Lactobacilli can help rebalance the vaginal microflora and promote vaginal comfort during times of occasional vaginal imbalance. Lactobacilli probiotics, which have a positive effect on endogenous microflora could thus help support the vaginal microflora and protect against some undesirable bacteria.

Meet women’s new best friend: ROSELLA

To recolonize the vaginal microflora zone, choosing the right bacteria strain is crucial. Moreover, only a handful of probiotic supplements taken orally can do the trick. L. plantarum P17630 (Proge 17630®), ROSELLA, is one of them.

L. plantarum P17630 (Proge 17630®), ROSELLA is a unique strain isolated from a healthy vaginal flora with full mechanistic and clinical evidence of efficacy on a wide spectrum of benefits, from helping to maintain proper vaginal balance, including from oral intake, to being used for recurrent Vulvovaginal Candidiasis (rVVC). This probiotic strain is one of the most documented in the world in the women’s health area, as it has been studied in over 800 women, in six clinical studies, including two by oral intake. In combination or not with conventional treatments for candidiasis (anti-fungal) women saw an improvement in candidiasis with a decrease in symptoms including less swelling, redness, burning or itching infection that can be caused by an overgrowth of bad bacteria. This probiotic strain also helped reduce the risk of recurrence of this candidiasis*.

ROSELLA is scientifically backed by mechanistic data. Studies showed this specific strain was able to adhere and interfere with C. albicans (in vitro studies). It demonstrated vaginal colonization and persistence following oral intake (validated efficacy dose: 5B CFU/day).

ROSELLA restores flora diversity associated with a healthy vaginal flora and promotes vaginal diversity associated with a healthy vaginal microbiota by normalizing pH. Furthermore, there are clinical evidences that this unique strain →

helps promote continued vaginal health in Vulvovaginal Candidiasis and in recurrent Vulvovaginal Candidiasis as adjunctive treatment with triazole or alone.

HOW CAN ORAL PROBIOTICS, AFTER PASSAGE THROUGH THE GUT, HAVE A BENEFICIAL IMPACT ON THE VAGINAL MICROFLORA?

Probiotics taken orally will pass through the gut, colonize the intestine and will be excreted in faeces. Anatomically, anus and vagina are very close, so naturally bacteria will pass and arrive in vagina in order to colonize it. This natural phenomenon occurs with "bad" bacteria causing infections like bacterial vaginosis, but also with "good" bacteria like probiotics. Gut to vagina passage was confirmed by clinical studies, in particular with ROSELLA which is found in vagina after oral intake. In Montella study, ROSELLA also showed persistence as ROSELLA was not only found in vagina after oral intake, but also after a 15 days wash-out period.

COLONIZATION OF THE VAGINAL MICROFLORA AND PERSISTENCE STUDY IN HEALTHY WOMEN [MONTELLA, 2013 AND 2014]

On 24 healthy women with a normal vaginal flora, an optimal oral intake dose was determined of 5B CFU/day with two cycles of 15 days intake followed by 15 days washout among different dose and regimen. ROSELLA strain was identified by Polymerase Chain Reaction (PCR) with specific strain primers in both faecal and vaginal samples, even after a 15 days washout period, demonstrating the gut to vagina passage, colonization and persistence.

EFFICACY STUDY IN HEALTHY WOMEN PRONE TO EXPERIENCING TEMPORARY IMBALANCES IN THEIR VAGINAL MICROFLORA [VLADAREANU, 2018]

Following the Montella pilot study confirming dose and safety, an efficacy study was conducted on 93 healthy women with recurrent vulvovaginal candidiasis enrolled during relapse-free period. These women took either ROSELLA (5B CFU/day) or a placebo during three cycles of 15 days, followed by 15 days washout. At T0, around 60% of women

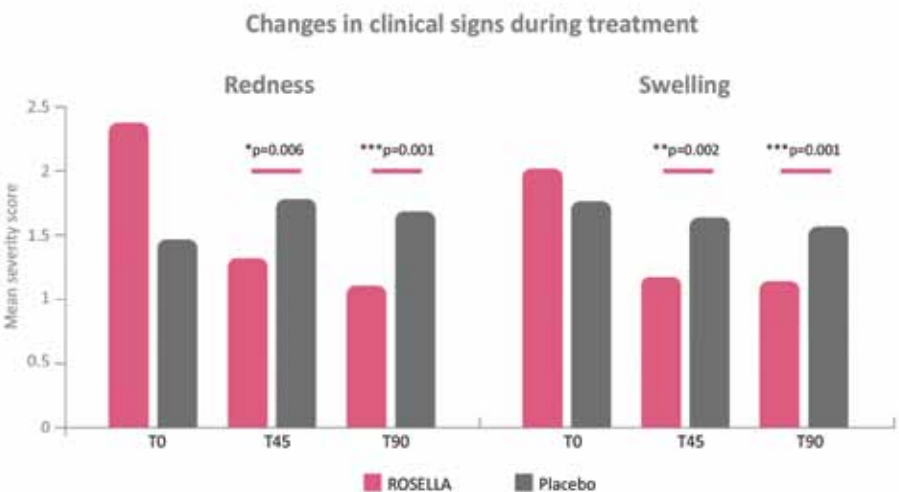
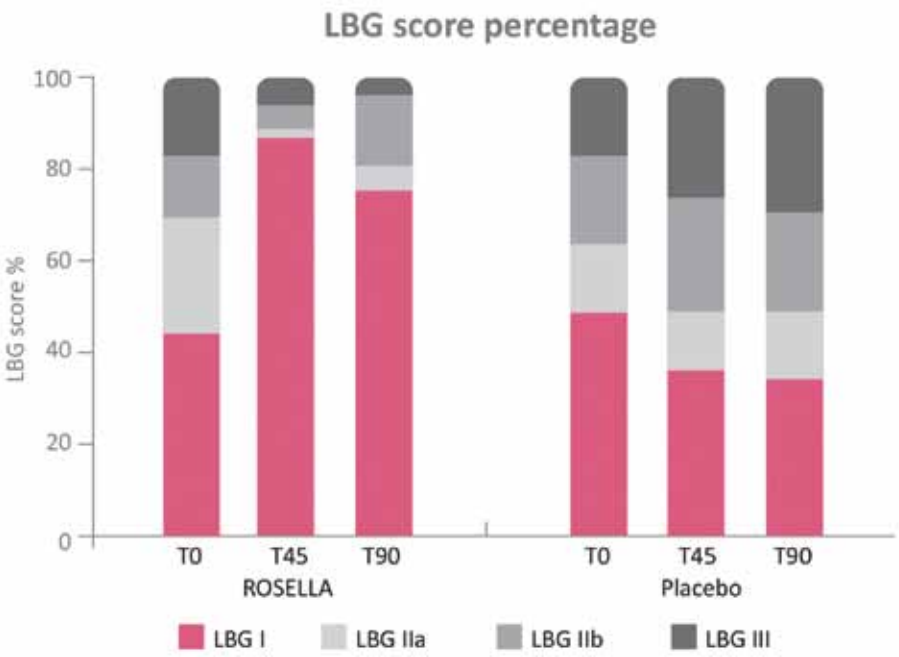
have an abnormal vaginal flora (LBG IIa to LBG III). In the ROSELLA group, there was a significant increase (p<0.0001), nearly the double of participants, with a normal flora (LBGI) after the first follow up at 45 days. There was also a maintenance of the normal flora after 90 days. As per the placebo group, there were no vulvovaginal candidiasis improvement.

In the same study, there was a reduction of the intensity of signs and symptoms associated with vulvovaginal candidiasis in the ROSELLA group. The changes in clinical signs during treatment showed a significant decrease of vaginal mucosa redness and in swelling intensity in comparison to the placebo group after 45 days. These results were persistent after 90 days.

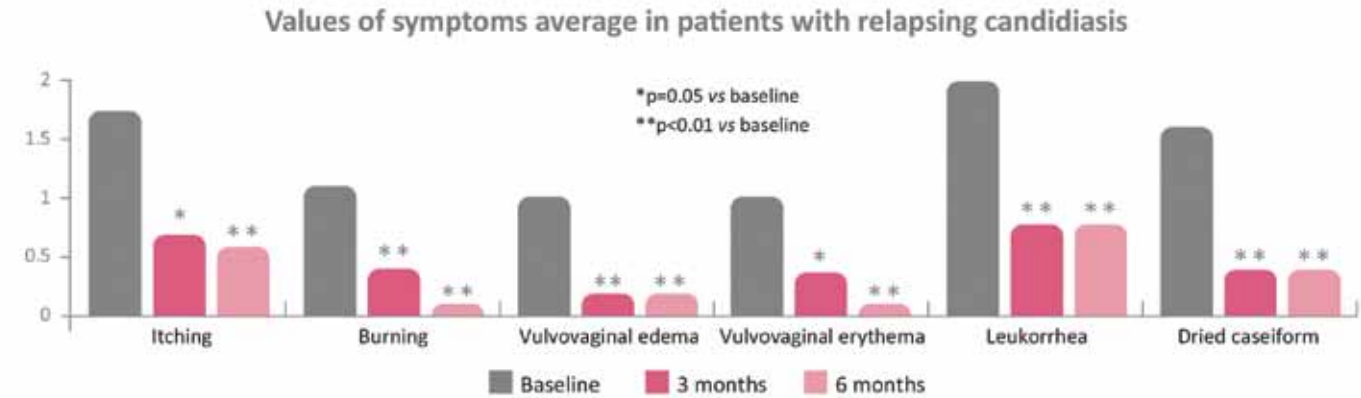
VAGINAL INTAKE PROOF OF EFFICACY: REDUCTION OF PH, SYMPTOMS AND RECURRENCES

In 2002, two Nava pilot studies on bacterial vaginosis and vulvovaginal candidiasis with ROSELLA vaginal intake (0.1B CFU/day), a significant reduction of symptoms was observed after intake period and also maintenance, after the follow-up period, when compared to baseline. There was also a significant reduction of the pH, which is an indicator of a balanced and healthy vaginal flora.

In 2007, Carriero conducted a large placebo-controlled study on 476 women with vulvovaginal candidiasis, with a pre-intake of anti-fungal in order to confirm pilot study results. With a significant vaginal



[Nava 2002, results]



pH normalization, significant reduction of symptoms, significant reduction of relapses and maintenance after four months, ROSELLA efficacy was confirmed.

In 2014, De Seta study results on pH normalization, increase of lactobacilli and improvement of symptoms, ROSELLA'S legitimacy was equally confirmed.

In 2016, Cianci, in order to open indications, ROSELLA was tested in a pilot study on 94 women with bacterial vaginosis (BV) and aerobic vaginitis (AV). After 15 days, a significant increase of reported clinical resolution was observed.

WHY MAINTAINING VAGINAL PH BALANCE IS ESSENTIAL TO KEEPING A HEALTHY VAGINAL FLORA?

The pH scale runs from 0 to 14. A pH of less than 7 is considered acidic, and a pH of more than 7 is basic. A normal vaginal pH level is between 3.8 and 4.5, which is moderately acidic. However, what constitutes a "normal" pH level can vary slightly during a women's life due to internal changes, and many external factors can also modify the pH levels in this delicate zone. Whilst an acidic vaginal environment is protective and creates a barrier that prevents unhealthy bacteria and yeast from multiplying too quickly and causing infection, weak acid, or raised pH levels provides the perfect setting for unhealthy bacteria to develop, hence putting women at risk of contracting various more or less severe infections.

LALLEMAND HEALTH SOLUTIONS

Quality probiotics. Complete solutions.

Company profile

The Lallemand group, parent company of Lallemand Health Solutions, is a private Canadian company specializing in the development, production and marketing of yeasts, bacteria and other ingredients linked to these microorganisms or their market.

Lallemand Health Solutions: vertically integrated probiotic manufacturer

Lallemand Health Solutions is a vertically integrated probiotic manufacturer specialized in the research, development and manufacturing of ready-to-market and custom probiotic formulations. Its products target specific populations and health segments including Gut health, Natural defenses, Brain-Gut axis, Women's health, Skin health, Oral health, Sport and Metabolism. Probiotics are produced in cutting-edge plants certified to the highest quality. More than 600 probiotic formulas are currently marketed in over 60 countries across five continents.

Full control is key

From lab to shelf, Lallemand Health Solutions has the full control and expertise to produce premium probiotic solutions, blends and custom formulations as each development step is expertly supported by internal quality insurance, regulatory affairs, research and development, scientific affairs, technical support, sales and marketing teams.

Scientific commitment

The Rosell® Institute for Microbiome and Probiotics by Lallemand, Lallemand Health Solutions' research and development center located at the National Research Council of Canada in Montreal, develops partnerships with key scientific experts in order to study the human microbiome and how probiotic supplements can be used as a mean to improve or maintain health in specific populations or health segments. The research team has issued over 330 publications including 160 clinical studies.

Lallemand Health Solutions offer ROSELLA as single strain, or it can be mixed with Expert'biotics or Unique'biotics or with other valuable ingredients (vitamins, minerals, etc.). ROSELLA comes in various convenient dosage forms and handy packaging

- Powder (bulk or in sachets or sticks)
- Orodispersible powder
- Chewable tablets
- Capsules in Alu-Alu blisters
- Enteric-coated capsules
- Acid-resistant capsules
- Sprinkle capsules
- ComboCap®'Biotics: a patented dual-chamber capsule combining powder and oil

Contact Lallemand Health Solutions for more details. HealthSolutions@Lallemand.com or visit <https://lallemand-health-solutions.com/en/rosella/>

* *L. plantarum* ROSELLA is *L. plantarum* P17630 (Proge P17630®), licensed from PROGE FARM®, Italy.



AN EXCEPTIONAL APPROACH TO ANDROPAUSE

By Maggie McNamara,
Marketing Director

Andropause (or “Male Menopause”) is rarely discussed in the medical community. While female menopause is an accepted medical condition with an array of treatments and therapies, andropause is often dismissed or downplayed as a figment of the patient’s imagination. This perspective, however, is beginning to change. And, Andropause is starting to garner the attention it deserves. As any middle-aged man knows from personal experience, the symptoms of andropause are very real indeed. Conventional medicine offers few alternatives for men experiencing its effects, and more and more sufferers are turning to natural treatments to find relief from their symptoms.

The scientific community has also lagged in its acceptance of andropause. The research in this area is certainly less robust than research on menopause. While the recognition is beginning to change and new research is being conducted, men need not wait for acceptance from conventional medicine. Our bodies age as we get older, causing hormone and chemical levels to decrease.

This, in turn, causes symptoms that can interfere with a full and satisfying lifestyle. Through natural therapies, men can reduce their andropausal symptoms, and enjoy a rich and fulfilling “second act” of life.

Supplements have been shown to help men experiencing moderate levels of sexual dysfunction brought on by middle age. For sufferers of andropause, the supplements offer some relief from the natural loss of libido and sexual stamina. Testofen, is a unique extract from fenugreek standardized to a proprietary matrix of saponin glycosides that Gencor has branded as their patented Fenuside™. Fenuside™ contains many bioactive compounds that have been carefully selected and standardized to a 50% minimum content of furostanol saponins. This clinically studied ingredient has shown to be suitable for any healthy ageing formulation.

Causes and Symptoms of Andropause

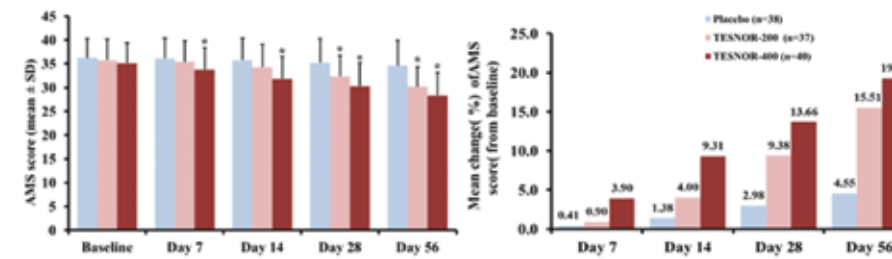
The underlying cause of andropause is the decrease in production of naturally occurring hormones within the body.

Age takes its toll on everyone, and a decrease in hormone production over time is common for both men and women. Testosterone levels in men begin to decrease as early as age 30 and continue to decline at an estimated 1% per year through the age of 50 and above. Add to that the natural fluctuation of other natural hormones and chemicals within the body and its little surprise that men begin to show symptoms of a “change of life” as they move into middle age.

More than 20% of men aged 65 years and older have low total testosterone levels and a higher percentage have low free testosterone levels.

A recent report from the BACH survey indicates that these older men are likely to have symptoms consistent with testosterone deficiency. Recently reviewed in Endocrine Today is a report from Laughlin et al, which showed that men with testosterone levels in the lowest quartile had a 40% increased risk of mortality during a 20-year follow-up, independent of multiple risk factors and pre-existing medical conditions. Nonetheless, men aged older than 65 years

Tesnor™ significantly improves AMS total scores and reduces aging related symptoms



only accounted for about 13% of the prescriptions written for testosterone in the United States.¹

Testosterone Decrease

Decreased testosterone production causes the levels of testosterone in the blood to decline. Testosterone production declines partly because the number of Leydig cells in the testes decline with ageing. This also appears to be related to changes in the hypothalamus and pituitary glands.

The testosterone produced in an ageing man’s body is also less efficient in performing its functions. This is because older men produce more of a hormone called “sex hormone binding globulin”, which binds to testosterone and reduces the amount available to fulfil its functions. Thus, while testosterone production declines by only around 1% each year, there is a 2–3% per year reduction in the amount of testosterone available to support the male sex drive and secondary sex characteristics. The numerous challenges the male body faces in maintaining testosterone levels whilst ageing sometimes lead to testosterone deficiency. Sex hormones are key anabolic factors, which is why their decline is associated with loss of lean muscle mass, increased abdominal fat, loss of drive, libido and stamina, which inevitably impacts quality of life.

Data from surveys conducted in other developed countries indicate that around 20% of men aged > 50 years have either low levels of testosterone in their blood, or exhibit symptoms of testosterone deficiency (e.g. excessive breast growth, loss of facial hair, rising voice).

The decrease in testosterone production is at the root of all andropause symptoms,



toms, including fatigue, depression, mood swings and loss of libido. Adding supplements like Testofen to one’s daily dietary intake can help to keep testosterone levels stable, bringing much relief to men suffering the symptoms of andropause.²

Why supplement?

Supplementing the diet with nutrient, along with regular resistance exercise, can help overcome some of the challenges related to reduced testosterone. Testofen® is a fenugreek extract standardized for 50% Fenuside™. It contains many bioactive compounds that have been carefully selected and standardized to a 50% minimum content of furostanol saponins. This clinically studied and patented ingredient has shown to be suitable for any healthy ageing formulation.

Gencor conducted a double-blind placebo-controlled trial to demonstrate the safety and efficacy of Testofen® among healthy adult males. (Steels et al, 2011, Wanhkede et al, 2015). The study showed that Testofen® is a safe and effective treatment for reducing symptoms of possible androgen deficiency (i.e. increase libido, sexual desire, muscle mass), improvement of sexual function and an increased serum testosterone in healthy middle-aged and older men.^{3,4}

In addition, Gencor has also sought a solution to help give male testosterone levels a boost. Tesnor™ is an herbal ex-

tract which combines Cocoa bean (Theobroma cacao) and pomegranate peel (Punica granatum) which helps to improve testosterone levels, while reducing Aging Male Symptoms (AMS) scores. Tesnor™ increases in-cell testosterone production and inhibits Aromatase activity, while also aiding with AMS scores and muscle strength and growth in young males. The ingredient is marketed as a food-derived, standardized and IP protected testosterone-boosting extract and is a well-researched, with an excellent safety profile that meets global regulations.

The Promise for Andropause

The onset of andropause begins with the gradual decrease in testosterone. Unlike menopause, the resulting symptoms develop much slower than they do for women. Given the tentative perspective of the scientific community, men are left with few reliable options in addressing their needs. The phenomenon of andropause is a reality and supplements like Testofen® and Tesnor™ can significantly improve physical symptoms, metabolic abnormalities (e.g. strength) and quality of life. Of course, any ongoing strategy to reduce the symptoms and risks of andropause should incorporate lifestyle approaches such as an optimal balanced diet, regular exercises, stress management with tobacco and alcohol consumption in moderation. These measures will help men to achieve the ultimate goal of providing dignified healthy ageing, and maintain highest quality of life, thereby adding life to years and not simply years to life. ●

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Originally developed for long-distance lorry drivers, Driver's Friend Energy Chews have proven to be appealing for a wide range of consumers who want increased alertness, energy, and focus.

CONSUMERS SEEK BETTER WAYS TO INCREASE ALERTNESS, ENERGY, AND FOCUS

By Arun K. Chopra – Sr. VP/ Chief Operating Officer – Tishcon Corp.

Humans have been looking for sources of mental stimulation for much of our existence. While the use of coffee dates back to the 15th century, caffeinated tea has been brewed for over 5,000 years. The quest for effective, safe, and convenient stimulants has only accelerated in modern times as evidenced by the explosive growth in the use of energy drinks around the globe. Today, maintaining an alert state of mind is critical to everything from driving to parenting, and to working and studying. Manufacturers from both the food and beverage and supplement industries are striving to create new and better solutions.

While coffee and tea remain as popular as ever, the demands of modern lifestyles and the preferences of today's younger population are creating a demand for new ways to increase alertness, energy, and focus.

Convenience is King

While many adults find coffees and teas

appealing both for their taste and their role in social settings, the logistics of brewing and transporting hot beverages makes them less than ideal in today's fast-paced, on-the-go societies. This explains, in part, the popularity of energy drinks with younger consumers. With energy drinks, there's no time lost brewing and no fear of spilling a hot drink on your lap while driving.

The form factor

One down side of the surging popularity of energy drinks is their environmental impact. Energy drinks are served almost exclusively in non-reusable cans and plastic bottles. Every time they're consumed it's an addition to the waste stream and the global struggle against environmental pollution. While coffee and tea are often served in reusable cups, mugs, and thermoses, the use of non-reusable containers for tea and coffee service outside of home, work, and restaurant environments has climbed steadily around the world. This puts additional strain on the waste stream.

More than just energy

At the same time consumers are looking for ways to stay sharp and alert, many have also come to be more aware of the health consequences of what they put in their bodies. Manufacturers have seized on this trend and created energy products that also deliver a variety of vitamins, minerals, and nutrition supplements. From vitamin B complex to ginseng, manufacturers are testing the consumer appeal of a wide range of popular health supplements in their energy products.

Consumers becoming more selective

While growth of the energy products industry continues, many consumers are increasingly inquiring into the possible negative effects of their energy supplement choices. Judging by the number of online search inquiries and threads on social media, the amount of sugar in energy drinks is a primary concern, and that concern is well-deserved. Some popular energy drinks have as much as 58 grams in a single serving - almost →

NEW! DRIVER'S FRIEND®

ENERGY & ALERTNESS SUPPORT



Driver's Friend® is a new, better way to maintain energy, focus, and alertness. With just two delicious, mocha-flavored chews, Driver's Friend provides energy within 30 minutes that lasts up to 4-6 hours.[†] To help support and maintain energy, alertness and focus, Driver's Friend combines a unique blend of ingredients in our proprietary formula – Caffeine (equivalent to one cup of coffee per serving), B-Complex vitamins that help release energy from food, and our patented HydroQsorb® CoEnzyme Q10 that is essential for energy production. **No water needed.**

Alert • Energized • Focused

Delicious Mocha Flavor Chews

- Vitamin B-Complex energy releasers
- Caffeine: 2 chews = ☕
- Increased energy within 30 minutes. Lasts up to 4-6 hours[†]

Proprietary Driver's Friend® Energy Chews are available for distribution under our registered trademark, or they can be PRIVATE LABELED to your brand.

To learn how Driver's Friend® Energy Chews can benefit your company, or to request a quote, call Peter Lambrechts at +32 468 078 101 or email peter.lambrechts@2q2q.eu

100% MONEY-BACK GUARANTEE

If for any reason you are not 100% satisfied, contact us for a full refund.**

www.driversfriend.com

[†]Study available upon request.

^{**}See driversfriend.com for refund details.

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50% more than in a typical 250 mL can of sugar-sweetened soda.

The newest option - energy chews

Energy chews were originally developed and marketed to athletes and active consumers as a means of replacing carbohydrates and electrolytes expended during activities. Some manufacturers then added caffeine to their formulas to provide an additional energy boost. More recently, the market has seen the introduction of energy chews specifically formulated to provide increased alertness, energy, and focus, without the large amounts of carbohydrates and electrolytes found in chews designed for athletic activity.

According to Raj Chopra, CEO / Chairman of Tishcon Corp., "we saw the demand for a highly convenient and healthy option for consumers who want an occasional boost in energy and mental sharpness, and so we created Driver's Friend Energy Chews (driversfriend.com). In addition to the caffeine equivalent to one 250 mL cup of coffee, we formulated Driver's Friend Energy Chews with our patented HydroQsorb® CoEnzyme Q10."

Coenzyme Q10 is essential for the production of ATP, which nutritionists have called the «energy of life." Chopra notes, Our HydroQsorb® CoEnzyme Q10 provides up to 8 times more absorption of ordinary Coenzyme Q10. There is no other energy shot, drink, supplement, or chew in the marketplace that contains this revolutionary, powerful and very beneficial ingredient."

While the first generation of energy chews were developed for active adults, Driver's Friend Energy Chews were originally developed for long-distance truck drivers. However, the convenience of the chews have appealed to a wide audience of consumers. "The simple energy chew form eliminates the need for bottles, cans, and cups – it's extremely convenient and has less environmental impact," states Chopra. In addition, a relatively low level of sugar has made the Driver's Friend formulation appealing. "We find that many consumers just want to be alert and focused. They don't necessarily need or want the high levels of sugar and electrolytes found in



Driver's Friend Energy Chews are extremely easy to keep on hand and create much less packaging waste than energy drinks or carry-away coffee drinks.



Compared with traditional energy chews, Driver's Friend Energy Chews are formulated with less sugar and more vitamins, as well as Hydro Q Sorb® Coenzyme Q10.

traditional energy chews," says Chopra. "Instead of excess sugar, we added Thiamine, Riboflavin B2, Niacin, Vitamin B6, Biotin B7, and Pantothenic acid B5, as well as our Hydro Q Sorb® Coenzyme Q10. We also added Magnesium, which is involved in over 300 vital reactions in the body and is involved in the production of energy.

More choices, better choices
The competition to develop, new, bet-

ter, and more unique energy supplements continues. But today, consumers have never had a greater range of choice or more healthy options for gaining increased alertness, energy, and focus. ●

For more information on Driver's Friend Energy Chews:

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www.driversfriend.com

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I QUIT.
IS SOMETHING
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A natural vegetable source of inorganic nitrates, Sabeet® (beetroot extract, *Beta vulgaris*) from Sabinsa, has been clinically tested to increase endurance as a result of reduced oxygen consumption.* Sabeet is a rich source of potent antioxidants and nutrients empowering you to keep going. Sabeet is also completely water soluble and has acceptable taste for adding in sports nutrition products such as whey proteins and liquid dietary supplements. When it comes to your health, nutrition and fitness aspects, never quit, never miss a beet.

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* These statements have not been evaluated by the EFSA. This product is not intended to diagnose, treat, cure, mitigate or prevent any disease.

MEETING THE DEMAND FOR EFFECTIVE, SUSTAINABLE ANTI-INFLAMMATORY SOLUTIONS



Concerns over long-term use of NSAIDs helped drive development of the Freedom® Anti-Inflammation Complex.

By Arun K. Chopra –
Sr. VP/ Chief Operating Officer –
Tishcon Corp.

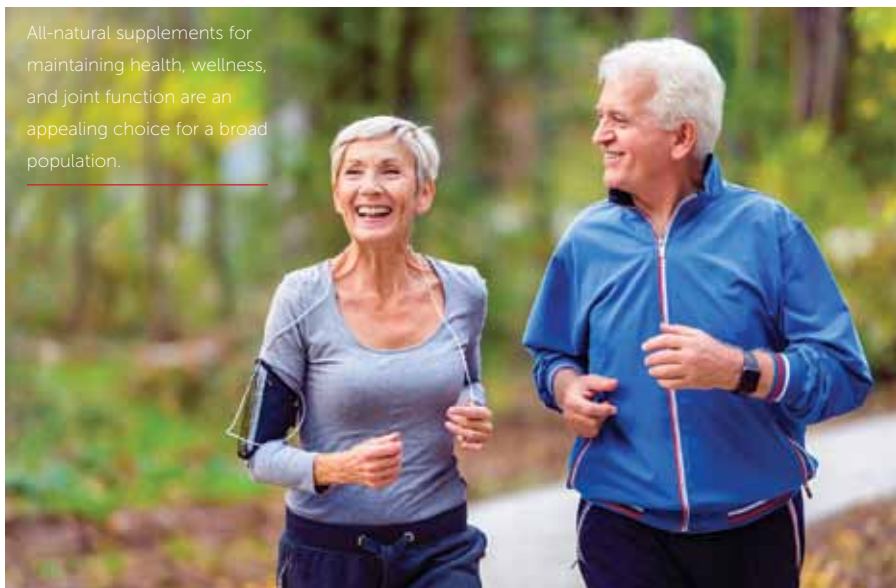
Consumers all over the world have become increasingly aware of the damaging effects of chronic inflammation – both as a cause of disease and a major health risk in its own right.

In recent years, news media, social media, and scientific publications have all reported on the importance of controlling inflammation to maintain health and mobility. In addition, recent studies have highlighted the connection between excessive inflammation and neurological diseases.

At the same time, consumers have also been made aware of the long-term risks behind over-the-counter and prescription anti-inflammatory medicines. Long-term use of these drugs have been shown to cause significant gastrointestinal damage, and many physicians are moving their patients away from these remedies, especially older patients.

The growing demand for effective, long-term anti-inflammatory solutions and

All-natural supplements for maintaining health, wellness, and joint function are an appealing choice for a broad population.



the consumer's desire to avoid the negative side effects of current medications were the motivation behind development of Freedom ETS Softgels® Anti-Inflammation Complex by Tishcon Corp, the developers of the world's number-one selling CoQ10 supplement.

Formulated to deliver a powerful anti-inflammatory punch of a proprietary combination of clinically tested and proven nutraceuticals, Freedom ETS Softgels®

Anti-Inflammation Complex has been designed to quell the insidious flames of destructive, silent inflammation.

Proven in independent University-based study:

The effectiveness of Freedom Softgels® in controlling inflammation was proven in a recent IRB approved study, conducted by Dr. Matthew Budoff and his team at Lundquist Institute for Biomedical Innovation at Harbor-UCLA Medical Center. →

The demand for effective, sustainable anti-inflammatory solutions is exploding. Tishcon has the answer.

Efficacious dosages.

Bioenhanced. Proven results.

The growing demand for effective, long-term anti-inflammatory solutions and consumers' desire to avoid the negative side effects of current medications have driven Tishcon Corp. to develop Freedom Easy-to-Swallow Softgels® Anti-Inflammation Complex (also known by the name Quell-Gel™).

Designed to quell destructive, silent inflammation, Freedom ETS Softgels® deliver a powerful anti-inflammatory composed of a proprietary combination of clinically tested and proven nutraceuticals.

Market Proven. Ready for growth.

Freedom ETS Softgels® have already demonstrated commercial success in retail, specialty, and online channels.

A majority of people experience some symptoms of joint pain, arthritis, and inflammation-related ailments after the age of 48. Freedom ETS Softgels® appeal to anyone in this group.

Proprietary Freedom ETS Softgels® are available for distribution under our registered trademark or they can be PRIVATE LABELED to your brand. (Available in 90 and 180 count bottles)



A unique formulation of all

natural, high-quality ingredients.

Freedom ETS Softgels® utilize a revolutionary combination of naturally safe ingredients clinically proven to provide significant anti-inflammatory activity – enhanced absorption curcumin, organic astaxanthin, wild caught fish oil, gamma linolenic acid, a full spectrum vitamin E complex including tocotrienols, vitamin D, hydroxytyrosol, and organic hemp seed oil, all are powerful anti-inflammatories and antioxidants.

Clinically observed benefits:

- Powerful anti-inflammatory
- Lowers hs-CRP levels and slows the increase in IL-6 level in adults
- Maintains blood pressure in the normal range
- Improves the elasticity of the blood vessels
- Robust increase in omega-3 index
- For joint health

freedom ETS®
easy-to-swallow softgels
Anti-Inflammation Complex

www.freedomsoftgels.com

To learn how Freedom ETS Softgels® can benefit your company, or to request a quote, call **Peter Lambrechts** at **+32 468 078 101** or email **peter.lambrechts@2q2q.eu**

Tishcon Corp.

50 Sylvester Street, Westbury, NY 11590
www.tishcon.com



The study followed 80 healthy individuals, both male and female. Participants were randomly assigned to receive either Freedom Softgels® or a matching placebo, and researchers monitored key indicators in order to evaluate the effectiveness of Freedom Softgels® on reducing inflammation as well as its effect on blood pressure and endothelial function.

In just 30 days, researchers found a significant reduction in high sensitivity C Reactive Protein and a slowing of the increase in Interleukin-6 – both key markers of inflammation. Also noted was a significant reduction in systolic blood pressure and a significant increase in the Omega-3 fatty acid index along with EPA levels and overall improved endothelial function.

The results of the study conducted at the Lundquist Institute for Biomedical Innovation at Harbor-UCLA Medical Center were published in Clinical Nutrition – the highly respected, peer-reviewed biomedical journal of ESPEN, The European Society for Clinical Nutrition and Metabolism. The full length article was published by the Journal as “A Combined Effect of Cavacurcumin, Eicosapentaenoic acid (Omega-3s), Astaxanthin and Gamma-linoleic acid (Omega-6) (CEAG) in Healthy Volunteers - A Randomized, Double-Blind, Placebo-Controlled Study,” confirms the clinical proof of the efficacy of the Freedom Softgels® formulation. Links to the complete study results can be found at www.freedomsoftgels.com

The Lundquist Institute study was done using the Freedom Softgel Anti-Inflammation Complex (First Generation) with a daily dose of four (4) softgels. A study of the Freedom ETS Softgel Anti-Inflammation Complex is underway, with a six (6) softgel daily dose for 90 days. The results of this study are expected by early 2021.

A focus on bioavailability

Knowing that beneficial ingredients are of no use if the body cannot absorb them, Tishcon researchers focused on ensuring high levels of bioavailability when developing Freedom ETS Softgels® Anti-Inflammation Complex. As a result, superior bioavailability sets Freedom ETS softgels apart from other anti-inflammatory supplements. As an



Freedom Anti-Inflammation Easy-to-Swallow Softgels® have been formulated to quell the silent, destructive flames of chronic inflammation.

example, the Cavacurmin® Curcumin Complex in Freedom Softgels® has up to 4000% the bioavailability of generic curcumin.

A unique formulation of all-natural ingredients

Freedom ETS Softgels® Anti-Inflammation Complex employs a proprietary combination of high quality ingredients that have been clinically proven in their own right to provide significant anti-inflammatory effects. The list of ingredients includes an enhanced absorption curcumin, organic astaxanthin, wild caught fish oil, gamma linolenic acid, a full spectrum vitamin E complex including tocotrienols, vitamin D, hydroxytyrosol, and organic hemp seed oil, all powerful anti-inflammatories and antioxidants. Freedom Softgels® also contain Vitamin K2 (MK-4), Vitamin K2 (MK-7), chromium and selenium.

ETS = Easy To Swallow

Tishcon Corp. researchers knew that a large percentage of the population, both young and old, have difficulty swallowing many tablets and capsules. For this reason, the latest generation of Freedom Softgels® were developed in a smaller, easy-to-swallow (ETS) capsule. The smaller size makes the benefits of Freedom ETS Softgels® Anti-Inflammation Complex available to most everyone.

Modern lifestyles fuel the demand

Poor diet is a leading risk factor for early death worldwide. In advanced and affluent societies, inflammation is driven by

the high intake of refined sugars, saturated fats, and trans fats. Inflammation resulting from poor diets, along with obesity and sedentary existence, contribute to chronic inflammation and a host of diseases including a high incidence of Non-Alcoholic Fatty Liver Disease (NAFLD). Tishcon is now developing a product (LivogenPlus®) for restoring health to the fatty liver by slowing the progression of NAFLD and possibly reversing the damage caused to the liver by excess fats and sugars (especially fructose) in the diet.

An appealing choice for a broad population

Choosing all-natural supplements as a method of maintaining health, wellness, and joint function was once the preferred choice of a relatively small percentage of the population. In recent decades however, media reports on the efficacy, safety, and long-term value of natural supplements has made them popular across a broad swath of the consumer base.

A majority of people begin to experience some symptoms of joint pain, arthritis, and inflammation-related ailments sometime after reaching the age of 48. Freedom Softgels® will appeal to anyone in this group.

According to Raj Chopra, Freedom Softgels® formulator and founder of Tishcon Corp., “The function of Freedom ETS Softgels® Anti-Inflammation Complex is to free you from the underlying causes of all that ails you. Chronic inflammation is both a symptom and a cause of many long-term diseases. Freedom Softgels® present an appealing remedy that consumers can rely on without the concerns caused by long-term use of steroids and non-steroidal anti-inflammatory drugs (NSAIDs). Freedom Softgels® are a ground-breaking product showing statistically significant results in a short period of time. The benefits will appeal to people with a broad range of health concerns.” ●

For more information on Freedom Anti-Inflammation ETS Softgels®:

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iDENTIFICATION OF THE CRITICAL POINTS

- **Naturality** : tested by HPLC (3 peaks), CCM, C14, Sudan free
- **Adulteration** : DNA tested, Dinitrophenol free
- **Tested for non-ionization**
- **Contaminants** : mycotoxins, toluen free, heavy metals, PAH, nicotine free

iDENTIC RESPECT FOR PEOPLE AND NATURE

- **Respect Humans** : help local population, work environment
- **Respect Nature** : controlled agriculture, GAP, environmental protection

iDENTITY OF THE INGREDIENT

- **Traceability from the farms to the final product** : annual contract with local farms
- **Characterization (taxonomy)**

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INDENA QUERCEFIT™: EFFECTIVE SUPPORT FOR RESPIRATORY HEALTH, WHEN ALLERGIES ARE RIFE

Quercefit™ is the Indena's unique Phytosome® formulation of quercetin deriving from flower buds of the natural plant *Sophora japonica* L.

Quercetin is potentially very effective for maintaining healthy conditions but, like many botanical extracts and natural compounds, is provided with poor water solubility. As a consequence, it is barely bio-absorbable, and that decreases its potential effectiveness. For optimal bioabsorption, natural products must have a good balance between hydrophilicity for dissolving into the gastro-intestinal fluids and lipophilicity to cross cell's lipidic biomembranes.

Indena's "biomimetic approach", adopted since years, allows the company to produce the new bioavailable quercetin on the market. Biomimetics is the science that studies Nature and natural phenomena to understand the principles of underlying mechanisms, to obtain ideas from nature, imitating its design, plans and processes and to apply concepts that benefit Science, engineering, and medicine, to solve human problems. NATURE AS MEASURE™ represents the very notion of biomimetics and its philosophical origins.

The search for a bio-mimetic approach

to optimize bioabsorption of natural compounds in the full respect of their natural profile, has been pioneered by Indena with the development of Phytosome®, the proprietary 100% food-grade delivery system which is the result of a wide experience and deep knowledge in product and process research. Phytosome® represents a natural approach to obtain a solid dispersion of poorly oral bioavailable compounds that can promote phytochemicals solubility and bioabsorption through improved wetting, reduced agglomeration and changes in the physical state of the active ingredients (such as modifications in the crystalline status or production of either partially or totally amorphous stable forms).

Back to Quercefit™, standardized in ≥36.0% and ≤42.0% of quercetin, five human studies have been focused on it. According to a published human pharmacokinetic study comparing the Indena formulation to unformulated quercetin, it proved to be up to 20-fold more bioavailable, in line with the levels of a diet rich in vegetables and fruits, preserving its profile of natural ingredient.¹

Twelve healthy volunteers of both sexes, aged 18-50 years, were administered orally with a dose of unformulated quercetin (500 mg) and two different doses of Quercefit™ (250 and 500



mg). Blood samples were collected at twelve time intervals (0h to 24h) after administration, and quercetin levels in plasma were measured by HPLC/MS/MS. Quercefit™ demonstrated a significant improvement of oral absorption of quercetin and allowed to reach optimized quercetin plasma levels in line with a vegetables and fruits nutritional approach (such as onions and apples).

Quercetin: the queen of flavonoids

Quercetin is categorized as a flavonol, one of the six subclasses of flavonoid compounds. Flavonoids are an important class of natural products: particularly, they belong to a class of plant secondary metabolites having a polyphenolic structure.

Flavonoids are a natural help for human wellbeing² for their antioxidant activity which is due to their ability to reduce free radical formation and to scavenge free radicals.

In Western populations, estimated daily intake of flavonols is in the range of 20-50 mg/day. Of this, about 13.82 mg/day is in the form of quercetin-type flavonols.³ Quercetin-type flavonols are widely distributed in the plant kingdom: they are found in a variety of foods including apples, berries, Brassica vegetables, capers, grapes, onions, shallots, tea and tomatoes, as well as many seeds, nuts, flowers, barks and leaves.

An extensive scientific literature demonstrates that quercetin has multiple biological activities: it has antioxidant, antiaging, anti-inflammatory and antiviral properties.^{4,5,6} Furthermore, it is important to highlight its potential use for maintaining well-being in situations of fatigue or stress.^{7,8}

As for the antioxidant effect, quercetin acts through a direct inactivation of free radicals, the inhibition of lipid peroxidation (oxidants such as free radicals attack lipids contained in cellular membranes, lipoproteins, etc.) blocking the oxidative stress cascade from the beginning; it also acts as inhibitor of enzymes, such as NO-synthase producing free radicals.

Moreover, quercetin reduces the activation and synthesis of crucial players in inflammatory process, such as NF-kB transcription factor, enzymes like cyclooxygenase (COX) and lipoxygenase (LOX) which catalyze the conversion of arachidonic acid to its metabolites, pro-inflammatory cytokines (e.g. TNF-α) and interleukins, mediators of immunity and inflammation.

Quercetin is also able to act as a modulator for immune cells, such as lymphocytes; the release of interferon-γ (IFN-γ); the activity of eosinophils, through inhibition of eosinophils peroxidase; the stabilization of cell membranes, managing release of histamine from mast cells, cause of sneezing, itchy eyes, scratchy throat and itchy skin; the inhibition of antibody IgE responsible for allergic symptoms causing release of chemicals which determine allergic reactions in the nose, lung, throat, and skin.

These positive evidences support the promising use of quercetin for respiratory health. Additionally, quercetin has shown in-vitro activity against multiple viral targets and very recently it arises as a promising ingredient against Covid-19.⁹ Also a new in vitro study conducted by the Institute of Nanotechnology of the National Research Council (Cnr-Nanotec) of Cosenza in Italy with a group of researchers from Zaragoza and Madrid, whose results have been published in the International Journal of Biological Macromolecules.¹⁰ confirms that quercetin can interact with COVID-19 virus replication.

Respiratory health and allergic discomforts: the demonstrated efficacy of Quercefit™

Respiratory area is one of the fields in which the health benefits of Quercefit™ have been recently explored.

Two human studies^{11,12} showed very in-

teresting results achieved by Quercefit™ for the maintenance of well-being by sensitive or intolerant subjects.

After 30 days of supplementation, using either 250 or 500 mg/day of Quercefit™, the subjects wellbeing and their seasonal discomforts were evaluated according to the GINA (Global INitiative for Asthma) classification system also considering the need of additional support. In such subjects Quercefit™ was shown to keep normal parameters related to diurnal and nocturnal respiration with particular regard to breath function (Peak Expiratory Flow) in mild persistent discomforts. The supplementary use of Quercefit™ along with the best available remedy, while optimizing general comfort management, and keeping a low oxidative stress, demonstrated to have a very good safety profile.¹¹

In a second human study focusing on local skin discomforts, Quercefit™ has been administrated for just 3 days, followed by a histamine local skin stimulus. Compared to the control, only the healthy volunteers supplemented with Quercefit™ showed a statistically significant dose-dependent control of all main local skin conditions along with capillary filtration reduction.¹²

According to available data, Quercefit™ allows to exploit quercetin health benefits in respiratory and lung discomforts.

Quercefit™: efficacy and safety

In addition to being highly effective in respiratory health, Quercefit™ has been shown to have an excellent safety profile.

A human study was conducted with Quercefit™ in order to investigate any interaction of this natural approach with common standard pharmacological treatments, controlling any possible harmful effect.¹³

The results might suggest that Quercefit™ does not alter the activity of the most common antiplatelet agents (acetylsalicylic acid, ticlopidine or clopidogrel, after 10 days of supplementation), has no impact in stable patients treated with warfarin or dabigatran after 20 days of supplementation and might not influence the metabolic control of diabetic

subjects taking metformin.

Efficacy and safety of Quercefit™ make the natural power of quercetin actually available for human health. ●

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By Jaume Reguant – Healthcare
Director, Bioiberica SAU

FINDING THE PERFECT INGREDIENT COMBINATION FOR OPTIMAL MOBILITY

Joint and mobility issues are a global problem, particularly for the senior population. Among joint disorders, osteoarthritis is the most common disease. Nutritional supplements are one option for individuals looking to manage joint disorders, like osteoarthritis. Traditionally, osteoarthritis has been considered as a mechanical “wear and tear” disease of the cartilage and ingredients such as chondroitin sulphate and glucosamine have been used to target specific symptoms of osteoarthritis, like pain and inflammation for example.¹

However, osteoarthritis is a disease that affects the whole joint, including the cartilage, subchondral bone, and synovial membrane and fluid. So, while some ingredients can alleviate certain symptoms associated with the condition, holistic solutions containing multiple ingredients may help to manage the condition more effectively, while also modulating the evolution of osteoarthritis. Discovering new ingredient combinations is not a simple task though, as manufacturers must understand both the science behind joint problems and the ingredients used to support joint health.

Understanding joint problems and osteoarthritis

The ageing population is increasing the risk and incidence rate of age-related diseases and joint health issues. Osteoarthritis in particular is very common,

currently estimated to affect 50% of the 60+ population in the US². By 2050, it is predicted that 130 million people will suffer from osteoarthritis worldwide, of whom 40 million will be severely disabled by the disease, putting increasing pressure on manufacturers to develop innovative joint health solutions.³

Osteoarthritis is a disease of the whole joint, often causing pain and swelling and contributing to mobility issues. In severe cases, it can lead to a loss of independence and significantly impact a person’s quality of life. Genetic predisposition and lifestyle, i.e. nutrition and levels of exercise, are two key factors behind the onset of the condition. In the early stages of osteoarthritis, there are changes in bone composition or in cartilage and other soft tissues that can be observed using an MRI scan or sonography. As it progresses though, structural changes in the bone, cartilage and soft tissues start to appear, getting worse until irreversible damage occurs, sometimes leading to joint failure. At this stage, the joint is no longer functional and needs to be replaced.

Previously, osteoarthritis could not be detected until it reached the pathological state observed in the latter stages of the disease and pharmacological interventions to control pain and inflammation were usually the only option to manage it. Nowadays though, technological ad-

vances mean osteoarthritis can be detected much earlier, when changes in the soft tissues first start to appear. Here, alternative approaches, like nutritional and lifestyle changes, may help to modulate the evolution of the disease while also managing early symptoms.⁴

Traditional ingredient combinations

Specific nutrients are known to support healthy joints. Two of the most common are glucosamine and chondroitin sulphate. Clinical and preclinical data shows that supplementation of both glucosamine and chondroitin can improve joint function and reduce pain.⁵ In addition, some studies have demonstrated a beneficial structural effect of glucosamine and chondroitin consisting in the reduction of joint space narrowing.^{6,7,8} Another ingredient that has been used to support mobility is hyaluronic acid. Patients with osteoarthritis are known to have diminished levels of hyaluronic acid in the synovial fluid.⁹ Hyaluronic acid extracted from rooster combs, which also contains collagen and polysaccharides, has proven efficacy in joint health, targeting and replenishing the synovial fluid.¹⁰

Native type II collagen: the new kid on the block

Collagen has rapidly gained market share across the joint health category in recent years, with native (undenatured)

type II collagen ingredients posting significantly higher growth than other collagen types. A new generation of collagen for joints – native type II collagen acts via a unique mechanism of action in the body, known as Oral Tolerance, to preserve endogenous collagen, helping to maintain healthy joints.¹¹ Effective at a low dose of only 40 mg/day,¹² it is fast-emerging as one of the leading modern ingredients for joint health by helping manufacturers to overcome the formulation challenges associated with other collagen ingredients (e.g. hydrolysed collagen required at doses of 10g/day), while also enabling the development of convenient products – often preferred by today’s discerning consumers.

Novel ingredient combinations for healthy joints

Native type II collagen can be used as a standalone ingredient to support joint health.¹³ However, recent studies combining native type II collagen with other complementary ingredients have shown promise for disorders like osteoarthritis, as ingredients work together to support the entire joint.^{14,15} For instance, a recent study demonstrates the effectiveness of combining native type II collagen with other key ingredients for joint health.¹⁶ In this study, osteoarthritis-induced rabbits were divided into three groups. Each group received a daily oral administration of the following combinations: group 0 (control group) – no treatment; group 1 – chondroitin sulphate (CS b-Bioactive®), glucosamine and hyaluronic acid (Mobilee®); group 2 – the same combination as group 1, but with the addition of native type II collagen (b-2Cool®).

Macroscopic evaluation showed a significant improvement in cartilage appearance in Group 2 when compared to the other groups in the study and was closer to that of healthy cartilage (figure 1). Group 2 also had a lower degree of cartilage degeneration, signs of less advanced osteoarthritis, healthier cartilage and joints and significantly better synovial membrane values on histology.

This is further supported by clinical trials. One such study demonstrated the effectiveness of native type II collagen combined with glucosamine and chondroitin

Groups	Treatments	Improved cartilage appearance	Improved cartilage structure, chondrocyte density, subchondral bone and synovial membrane	Improved synovial membrane	Similarity to a healthy joint
0	None	-	-	-	-
1	CS - CS b-Bioactive® (chondroitin sulphate) +GH - (glucosamine) + HA - Mobilee® (rooster comb extract rich in hyaluronic acid)	+	+	+	+
2	CS + GH + HA + NC - b-2Cool (native type II collagen)	++	+	++	++

Figure 1: Summary of the main results obtained in the different study groups after 84 days.

sulphate to reduce articular and bone damage caused by osteoarthritis. Here, subjects reported significantly reduced pain following one year of treatment.¹⁷ Another trial looked at the effects of combining native type II collagen with acetaminophen to treat knee osteoarthritis. After three months of treatment, those receiving this combination reported significant improvement in joint pain, quality of life and functionality.¹⁸

Such evidence shows that adding native type II collagen, b-2Cool®, to a targeted ingredient combination can help to further support joint health, by preserving endogenous collagen, thus helping to maintain a healthy joint structure. Manufacturers seeking an effective solution for supporting joint health should therefore consider a holistic approach such as this to support the entire joint.

To discover more about the scientific studies supporting Bioiberica’s native type II collagen – b-2Cool®, visit: <https://bioiberica.campaign.page/b-2cool>. ●

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What's new?
What's exciting?
How can we meet
consumer demand?

Q&A WITH DUPONT

Prior to the pandemic, traditional tradeshows were considered the prime platform to launch new products, meet with existing and potential customers and explore industry trends. Now, faced with nation-wide shutdowns and travel restrictions, tradeshows have quickly evolved to meet suppliers and customers where they are – home.

As a result, virtual events like Vitafoods Virtual Expo are becoming more ubiquitous. And though the pandemic has changed everything about how we at DuPont attend tradeshows, the fundamentals haven't changed. At the end of the day, our customers are still asking, "What's new? What's exciting? How can we meet consumer demand?"

As we navigate these virtual experiences, it's imperative to retain the same customer-centric approach we would provide in a face-to-face setting. This requires connecting and engaging with formulators and brand-owners by offering educational information on upcoming trends and answering their questions with a future-forward gaze. In this article, we share a few common questions

we heard at Vitafoods Virtual Expo and explore how manufacturers and brand owners can continue to evolve.

What trends are you seeing in probiotic applications for food and beverage?

We're seeing a growing demand for probiotics in a wide range of food and beverage (F&B) formats that traditionally have not been viable. These include products like kombucha, fruit juices or bars that have high water activity.

Formulators can tackle these challenging F&B applications by incorporating spore-forming probiotic bacteria, which helps ensure probiotic viability from manufacturing through the product's shelf life. Since probiotic spores have a protective layer -- which allows viability in conditions such as high heat, high water activity or highly acidic ingredients -- they've become a great alternative for formulators looking to develop an application with a low pH, high water activity, long shelf life or high heat manufacturing.

For example, our highly stable, *Bacillus subtilis* Bss-19 brings the benefits of a probiotic to the aforementioned

challenging applications. As a spore-forming probiotic bacteria, *B. subtilis* Bss-19 is adept at surviving even the toughest functional applications where traditional lactic acid bacteria (such as lactobacilli or bifidobacteria) may not be ideal. This creates an opportunity for brand owners to launch products in trending formats such as gummies, fermented teas, bars and snacks, where conditions may not support probiotics from the more established lactic acid bacteria category.

What about trends in the probiotic dietary supplements sector?

The probiotic dietary supplement market is swiftly evolving to focus on microbiome health. As consumers become more aware that gut health influences all aspects of the body, we expect to see an increased demand for more individualized products. Brands will likely continue to add functional products targeting cognitive, women's health, anti-aging, and metabolic health to their product portfolio, and we'll see even more probiotics tailored to specific needs hit the shelves in the next year.

Additionally, emerging formats in the

dietary supplement category -- such as chewable tablets, gummies, soft gels and oil drops -- are gaining popularity. Traditional formats such as capsules still remain the largest category for dietary supplements, but we're seeing a shift in consumer preference towards tastier, more convenient formats.

The popularity of these new formats can be attributed, in part, to pill fatigue. Consumers faced with multiple pills per day are favoring formats like gummies and chewable tablets because they are tasty and offer a welcome change to the traditional capsule. Not only can they come in a variety of flavors and shapes, they offer an enjoyable mouth texture and don't require water to be consumed. This provides consumers a much more enjoyable experience and increases the likelihood of their compliance.

Other formats are gaining traction due to sheer necessity. For example, infants are unable to swallow a pill or chew a tablet, so manufacturers and brand owners must be innovative in their formatting approach. They can consider formulating dietary supplements in a liquid format, to be administered to the infant via a dropper.

How can formulators approach these new trends in a savvy manner?

When developing products tailored to unique consumer needs, such as immune or cognitive health, formulators should remember that probiotic strains are not a "one size fits all" solution. As they source a strain for a new product, they must also consider the consumers' unique lifestyle needs, including how immune function differs depending on age. For example, our HOWARU® Protect line is comprised of 5 different products all tailored to support the health of specific groups including infants, school-age children, athletes, adults and seniors. Other strains in our HOWARU® probiotic line are tailored to help consumers maintain their weight, support healthy digestion or promote oral health.

Other attributes that formulators need to consider when gauging a new probiotic strain's quality include performance, stability and functionality. They should

source strains that utilize efficient fermentation and concentration drying processes, as well as stability technology. These will help the probiotics reach consumers in their most active, optimal form. Manufacturers looking to develop a robust, tailored probiotic product should collaborate with suppliers who demonstrate clinical efficacy, safety and product quality.

When it comes to developing probiotic products in new formats, working with a supplier who understands stability is key. Oftentimes, emerging formats require expertise in probiotic formulation to ensure the claims on the package are valid through the end of the product shelf-life. It's also helpful to work with a supplier who has expertise in some of the other key ingredients needed to make these new formats.

For example, DuPont has a full portfolio of ingredients that goes beyond probiotics into the pharmaceutical and food and beverage spaces. Paired with decades of expertise in pharmaceutical formulation development, we enable greater formulation with confidence. By partnering with DuPont, manufacturers gain an extra edge in formulating their dietary supplements with optimal delivery and format in mind, while meeting evolving consumer demand.

Consider the growing demand for vegan supplements. If a manufacturer wants to develop a vegan gummy probiotic, we can offer formulation expertise for both probiotics and pectin, a vegan alternative to gelatin that's sustainably sourced from citrus peels. Formulating a vegan gummy has its own set of challenges, and we can guide manufacturers through development, and work with them to create a heat stable, great-tasting gummy with a pleasant mouthfeel.

Amid the global pandemic, consumers are prioritizing immune-boosting probiotics. How are you helping your customers meet this demand?

We're collaborating with our customers to help them identify the product that meets their customers' specific needs. Our HOWARU® Protect line is a unique range of clinically documented probiot-

ic solutions which was developed specifically with immune defense in mind and targets specific consumer needs by age and lifestyle, helping them maintain their natural immune defense.

- Formulators developing a product to promote infant immune health can turn to HOWARU® Protect EarlyLife, which helps to support immunity soon after birth. Studies of *Lactobacillus rhamnosus* HN001™ have shown infants and toddler who take a daily dose of this product still show immune health benefits eleven years later.

- For kids' probiotics, our HOWARU® Protect Kids features a multi-strain combination, *Lactobacillus acidophilus* NCFM® and *Bifidobacterium lactis* Bi-07™, which helps to promote maintenance of respiratory health and overall wellness in children. A study published in Pediatrics¹ found that children taking this probiotic strain saw a decrease in both antibiotic use and number of missed days at school

- Formulators seeking immune support for adults can consider HOWARU® Protect Adult, also known as *Bifidobacterium lactis* BI-04®. This strain helps to stimulate and support the immune system prior to infection. A recent clinical study demonstrates that BI-04® can actually bolster healthy respiratory function in adults.

- For physically active adults, our HOWARU® Protect Sport features a multi-strain combination of *Bifidobacterium lactis* Bi-07™ and *Lactobacillus acidophilus* NCFM® which helps them stay healthy, allowing more time for exercise. At higher doses, this same blend has been shown to promote gut comfort and reduce occasional bloating.

- Our HOWARU® Protect 55+ improves aging adults' immune function and help shift microbial balance in favor of a healthy gut. It's a safe efficacious way for the aging population to stay healthy.

Whatever the strain or product format, we're working with our customers to deliver products that meet consumers' evolving needs. ●

1. <https://pediatrics.aappublications.org/content/124/2/e172.long>

STRESSED OUT?

Natural astaxanthin offers relief and supports a healthy body and mind



Stress has been around since our ancestors roamed the African savanna. It gave them the alertness and strength they needed to survive in a hostile environment. In modern times, we no longer need to outrun predators or fight for survival, but we experience stress in other forms in our lives – at work, at home, and even during leisure time.

Stress and fatigue wear us down

Stress and burnout are becoming a widespread problem in our society. Prolonged stress causes mental and physical fatigue and can lead to mental health issues. In a study conducted in 2009, 59% of the participants said they had high levels of stress, with alarming numbers of individuals reporting possible depression (33%) and anxiety (64%)¹. The list of stress-related symptoms is long and includes skin problems such as increase acne severity² and frequent sickness due to a suppressed immune system. Studies have shown that individuals under chronic stress battle frequent colds³, upper respiratory tract infections⁴, chronic fatigue and insomnia⁵. A robust work-life balance, sufficient sleep and a healthy diet are the best ways to maintain natural energy levels and fend off the consequences of stress. However, our modern lifestyles often make it difficult to provide our body with the nutrients it needs. Fortunately, there are plenty of natural supplements we can turn to.

Natural astaxanthin fights mental and physical fatigue

One of these nutrients is natural astaxanthin. Nature's most powerful antioxidant and anti-inflammatory has a wide spectrum of health benefits. In 2016, researchers investigated the effect of astaxanthin on physical and mental fatigue in a double-blind, placebo-controlled study where individuals were treated with 12 mg AstaReal® natural astaxanthin for eight weeks⁶. The study was designed to induce stress and fatigue similar to that encountered in daily life. Participants were subjected to a series of physical tests with a bicycle ergometer and mentally challenged by a number of timed calculations. The results clearly showed that astaxanthin suppresses and fights both mental and physical fatigue, heightens concentration and motivation and improves general mood status.

Analysis of salivary cortisol concentrations before and after mental tasks revealed that astaxanthin significantly lowered the concentration of the stress hormone cortisol. Similar results were seen for secretory immunoglobulin A (IgA) concentrations. During physical and mental load, the placebo group experienced a drastic reduction in salivary IgA levels, whereas supplementation with AstaReal® astaxanthin prevented a decline in antibody counts⁶.

Better sleep

Chronic mental stress has been recognized as a major cause of sleep disorders and depression. When menopausal women, suffering from characteristic symptoms of chronic fatigue such as tired eyes, stiff shoulders and insomnia, were treated with natural astaxanthin, all symptoms including insomnia improved significantly⁷.

Specific nutrient combinations with astaxanthin have also proved to be successful: For instance, zinc is an essential mineral that plays an important role in numerous cellular functions, including sleep modulation⁸. In a Japanese study from 2016, the combination of zinc and astaxanthin improved sleeping patterns, most likely by enhancing the absorption of zinc through astaxanthin⁹. Other studies have shown that patients suffering from insomnia had a higher risk of developing depression and anxiety than those without sleep disorders¹⁰.

Fighting digital stress

A Japanese study with 24 healthy volunteers demonstrated that a combination of astaxanthin (3 mg) and sesamine (5 mg) promotes recovery from computer-based mental fatigue¹¹. Since the effect was found to be dependent on the astaxanthin concentration, the researchers concluded that it must be due to the presence of the antioxidant.

An earlier study addressing the same health problem demonstrated that supplementation with astaxanthin significantly lowers levels of fatigue. According to the Visual Analog Scale (VAS), the participants receiving astaxanthin stated a "reduced sense of mental and physical fatigue, clarity of thinking, better concentration and improved motivation". When questioned about their state of mood, or Profile of Mood Status (POMS), the astaxanthin group scored significantly higher than the placebo group¹². The latter results have been confirmed in another study showing that natural astaxanthin reduces negative mood state parameters such as depression and fatigue and improves overall mood status¹³.

Staying fit in body and mind

Mental wellbeing can be negatively affected by chronic stress, and also by age. Several studies have revealed astaxanthin's positive effect on elderly patients with mild cognitive impairment¹⁴, improving memory and overall cognitive function^{15,16}. The old concept of "healthy mind, healthy body" is receiving renewed attention due to the importance of maintaining physical and cognitive health throughout our health span – the period of our lives when we are generally in good health and able to enjoy a reasonable quality of life. With human lifespans now longer than ever, we face the risk of a significant period of frailty and depend-

ence if we do not take reasonable precautions to maintain our health.

Regular physical exercise not only strengthens muscles, joints and the cardiovascular system, it is also beneficial for our state of mind. Several studies have shown that natural astaxanthin supports an active lifestyle by enhancing mitochondrial energy production, which is essential for keeping the body moving and the mind whirring¹⁷. Natural astaxanthin was found to improve muscle performance not only in intensively trained athletes¹⁸, but also in elderly people with age-related muscle loss¹⁹.

Astaxanthin quality and source

As natural astaxanthin's appeal to the supplement industry is increasing and demand is growing steadily, manufacturers should pay attention to supply and quality standards, however. The most common source of natural astaxanthin is the freshwater alga *Haematococcus pluvialis* and the quality depends on the environment in which the algae are cultivated. Unlike many other astaxanthin producers, AstaReal cultivates *H. pluvialis* in state-of-the-art indoor photobioreactors under controlled conditions, eliminating the influence of fluctuating environmental impacts and possible contamination with pollutants. As a result, AstaReal is able to offer astaxanthin products of the highest purity and safety. ●

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MENAQ7® VITAMIN K2: The Key to Securing General Health

Vitamin K2 has been proven to support bone and cardiovascular health through its activation of K-dependent proteins. But promising early research is identifying that K2's very mechanism plays an integral role in helping obtain better overall health, impacting other important systems.

While luck plays a part in achieving longevity, it is more attributable to years of healthy living and nutrition. Research has established that the body will remain functioning adequately into our senior years if it receives the necessary supply of nutrients, either through diet or supplementation.

Vitamin K2 – specifically K2 as menaquinone-7 (MK-7) – is emerging as a vitamin that contributes significantly to whole body health, thereby promoting increased ability to age in a healthy way. Research has clearly linked a lack of adequate K2 to higher risks of age-related degradation of the skeleton and cardiovascular system, yet newer research has added other areas of health to that list, including dementia and vision, among others.

How K2 Works

The common activity in these disparate conditions is the status of proteins – specifically Matrix Gla Protein (MGP) and osteocalcin (OC). These proteins are either working (carboxylated) or inert (uncarboxylated). The more active proteins in circulation, the better functioning are physiological systems that depend on those proteins. When it comes to bone and heart health, OC and MGP are dependent on Vitamin K2, respectively.

MGP ensures calcium does not aggregate on the interior linings of arteries. Such aggregation creates plaques that cause the arteries to gradually stiffen and narrow, reducing oxygenated blood flow to the heart, brain, eyes, and peripherals. Studies have confirmed that the high presence of vascular calcification is an indicator of dangerous cardiovascular status, and that MGP is one of the most important known modulators of vascular calcification. MGP is dependent on K2 to activate it, thus allowing it



“THE COMMON ACTIVITY IN THESE DISPARATE CONDITIONS IS THE STATUS OF K-DEPENDENT PROTEINS

to sweep calcium away from arteries and vasculature.¹⁻⁶

Here's how activation occurs: Vitamin K-dependent proteins – such as MGP – contain glutamic acid (Glu) residues. During carboxylation (i.e., when a carbon atom double-bonded to an oxygen atom and single-bonded to a hydroxyl group is introduced), Glu is transformed into gamma-carboxyglutamate (Gla) residues by the enzyme Gamma glutamyl carboxylase.

Gla binds calcium ions and ensures that calcium is deposited in the bones, where it is needed. It keeps calcium away from the heart and the blood vessels, where

it could cause damage. For all of this to happen, Gamma glutamyl carboxylase needs Vitamin K2 as MK-7 to start the process.

Proven and Potential Health Benefits

The power of Vitamin K2 as MK-7 has been elucidated by NattoPharma ASA (Norway) and its global research affiliates. NattoPharma's proprietary and unique MenaQ7® is the pioneer and the standard Vitamin K2 as MK-7. Yet, based on K2's proven ability to carboxylate MGP and osteocalcin, other health areas wherein K2 may be relevant and effective are being explored more in depth:

Cardiovascular Health: A groundbreaking three-year study followed 244 healthy post-menopausal women (aged 55 to 65), who consumed either 180 mcg MK-7 (MenaQ7® from NattoPharma ASA) or placebo; pulse wave velocity and ultrasound techniques were used as the main biological markers to assess cardiovascular status. The results demonstrated that MenaQ7® inhibited development of age-related stiffening of the artery walls and made an unprecedented statistically significant improvement of vascular elasticity.⁷

A one-year follow-up clinical study of men and women also showed improved vascular health after daily K2 supplementation (180 mcg as MenaQ7®).⁸

Further, a 2020 observational study revealed that a higher intake of vitamin K2 was associated with lower risk of coronary heart disease (CHD), while there was no association between intake of vitamin K1 and CHD.⁹

Bone Health: A seminal study confirmed the bone-health benefits of Vitamin K2 as MK-7. The 3-year study of 244 healthy

postmenopausal women showed a daily 180mcg dose of MenaQ7® resulted in improved bone mineral content and density, as well as bone strength.¹⁰

Further, research has demonstrated that skeletal protection should begin in childhood: one study of healthy children aged 6-10 years showed that 45 mcg of MenaQ7® K2 / day resulted in more active OC, leading to stronger, denser bones.¹¹

Brain and Vision Support: Arterial stiffening via calcification, itself caused by high circulating uncarboxylated MGP, also occurs in the brain and in ocular capillaries (i.e., retinal microcirculation). Two recently published papers examined the role of calcification-induced aortic stiffness as a contributing factor to dementia/Alzheimer's and retinal arterial health, respectively. Both conditions are impacted by MGP status.

Aortic stiffness is a result of cardiovascular disease risk factors (e.g., hypertension, diabetes, age, etc.), and is measured by carotid-femoral pulse wave velocity (cfP-WV). High cfPWV is linked to white matter hyperintensities and brain amyloid deposition, and to cognitive decline. As such, the authors of one study questioned whether interventions to slow arterial stiffening (such as K2 supplementation) can reduce the risk of dementia.¹²

As previous studies suggested that active MGP helps maintain the integrity of the renal and myocardial microcirculation, researchers investigated its role in preserving the retinal microcirculation in a Flemish population. They concluded that circulating inactive MGP can be used as a long-term predictor of smaller retinal arteriolar diameter in the general population. The observations raised the possibility that vitamin K2 supplementation might promote retinal health, as the authors noted previous studies showed individuals with glaucoma presented a higher aortic pulse wave velocity, as well as generalized arteriolar narrowing.¹³

Blood Sugar: Individuals presenting with type 2 diabetes mellitus (T2DM) have chronic hyperglycemia as a consequence of decreased insulin sensitivity, which contributes to bone demineralization and is likely related to changes in serum levels of OC and insulin. This is

greater when there is a lack of sufficient consumption of vitamins D3 and K2. One recently published study evaluated the effect of vitamin D3 and vitamin K2 supplements alone or in combination on OC levels and metabolic parameters in 40 adult participants with T2DM. Vitamin K2 was found to elevate carboxylated OC levels, which appeared to have positive impact on factors of T2DM.¹⁴

Migraines: Individuals who have migraines have presented with significantly increased arterial stiffness as compared with their age- and sex-matched control subjects. This increase in arterial stiffness is correlated with an increase in markers of vitamin K2 deficiency (i.e., uncarboxylated MGP).¹⁵

IBD: Lower gastrointestinal diseases such as inflammatory bowel disease (IBD) also appear to have a high level of uncarboxylated MGP as a core etiological factor. A cross-sectional study, conducted on 70 participants with IBD (30 with ulcerative colitis and 40 with Crohn's disease) and 60 age- and gender-matching healthy controls, showed that undercarboxylated MGP levels are significantly higher in those with IBD compared to the healthy control group.¹⁶

Parkinson's Disease: K2 is able to pass through the blood-brain barrier, making it an appropriate subject to study in areas such as Parkinson's Disease, characterized in part by neuroinflammation. A newly published study linked low K2 status with neuroinflammatory status in Parkinson's patients.¹⁷

General Health Support: A recent clinical investigation showed a link between Vitamin K2 status in individuals with COVID-19. K2 status was evaluated in 123 individuals with COVID-19 and 184 controls. Results revealed that inactive MGP levels were significantly higher in COVID-19 patients compared to controls, as well as those COVID-19 patients with unfavorable outcomes compared to those with less severe disease (good outcome) – all pointing towards a link between vitamin K deficiency and disease severity. Also, low active MGP levels were significantly correlated with desmosine levels, a measure of the breakdown of elastin, which is an important factor for pulmonary health.¹⁸

The Long Road of K2 Research

While the body of published human clinical data around Vitamin K2 as MK-7 is substantial and provides a solid basis for its role preserving health as one ages, this important work is far from complete:

- A clinical trial will evaluate the efficacy of Vitamin K2 for Parkinson's patients in Germany, with the goal of determining if vitamin K2 can increase energy levels and improve symptoms people with mitochondrial-related Parkinson's.

- As COVID-19 remains a pandemic, research is underway in India and the Netherlands to continue uncovering the applications for K2 as MK-7 for supporting good outcomes in those with the virus. ●

NattoPharma, the global leader in vitamin K2 research and development, is committed to driving research, educating about the impact of vitamin K2 deficiency, and correcting this imbalance to improve global health outcomes for all life's stages.

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OMEGA-3s ACROSS THE GENERATIONS:

Why it is never too early to start when it comes to EPA and DHA consumption

By Cosimo Palumbo,
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Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) omega-3 long-chain polyunsaturated fatty acids (LCPUFAs) are important nutrients that play a critical role in human growth and development, as well as overall health and wellbeing throughout life. However, despite their multiple health benefits – including those supporting trending health concerns like immunity, sports performance, sleep and mood – it is estimated that less than 20% of the world's population consumes the recommended daily intake of 250 mg/d.¹ A significant proportion of the population – from infants right through to the elderly – may therefore be missing out on the health benefits these nutrients offer, increasing their vulnerability towards illnesses including non-communicable diseases (NCDs) like cardiovascular disease (CVD), in later life. As new research and awareness of their full potential continues to emerge, there is an opportunity to fully understand the role these LCPUFAs play over the life course and how they can promote holistic health benefits for consumers of all ages.

Supporting the best start in life

To date, more than 40,000 published studies, including 4,000 human clinical trials, have been carried out on the important role that omega-3s EPA and DHA play throughout the life stages. DHA is

well-known to promote optimal growth and development during the first 1,000 days – between the onset of pregnancy and the child's second birthday – laying the foundation for a healthy childhood, adolescence and adulthood.² DHA has also been shown to have a positive long-term effect on neurocognitive development.³ Furthermore, a Cochrane review of omega-3 LCPUFAs recommendations showed that DHA and EPA lowered the risk of having a preterm baby by 11%, and an early preterm baby by 42%.⁴

Omega-3s are also becoming increasingly well-recognized for their role in optimizing immunity in early life. Immune tolerance is built up over pregnancy and continues to develop throughout the child's life to support immunological responsiveness and reduce allergic inflammation. One key study found that the infants of mothers who took fish oil during pregnancy were less likely to be sensitive to egg, have IgE-associated eczema or a food allergy.⁵

1,000 days and beyond

The first 1,000 days is a critical period in a child's life, and therefore an important time for mothers to ensure optimal omega-3 intake. But for expectant mothers, omega-3s have also been shown to offer additional benefits. Research indicates that DHA is critical to maintaining normal

brain function throughout life, including attention and learning, cognitive health, memory and reduction of symptoms associated with some mood disorders. And studies focusing on prenatal depression have shown that omega-3 supplementation helped pregnant women maintain a healthy, balanced mood during pregnancy and after giving birth.⁷

It is clear that omega-3s offer myriad benefits during infancy, but also in adulthood and everywhere in between – and this is reflected in the scientific evidence. One study, for instance, in children aged between 7-9 years found that sleep duration was increased by one hour after DHA intake was increased.⁸ A further report showed that teenagers with the highest levels of DHA⁹ in their plasma slept 32 minutes longer when supplemented with DHA. These positive effects on sleep quality and duration have also been observed in adults.¹⁰

The immunity benefits of omega-3s also extend beyond childhood to support normal immune function in individuals as they age – in adults, it is the anti-inflammatory properties of omega-3s that contribute to normal immune function.¹¹ EPA and DHA present at the site of inflammation are enzymatically converted to molecules that, along with others, function together to

coordinate the resolution of inflammation at the end of an immune response and support healing.^{12,13} The anti-inflammatory properties of EPA and DHA have also been shown to aid fitness and exercise recovery, which is key as consumers of all ages look to lead more active lifestyles.^{14,15,16,17,18,19,20,21,22,23}

Omega-3 consumption: the sooner, the better

The role of omega-3s in both eye and heart health is also well-recognized, particularly in adults. Studies investigating the link between omega-3s and heart health have concluded that it is so strong that an 'omega-3 index' blood test has been developed to measure the levels of EPA and DHA in the blood to determine if an individual is at risk of CVD. A new study has, however, also highlighted the associations of risk factors in young adulthood with later life heart disease and stroke risk – bringing new emphasis on early prevention of heart disease in children and adolescence. Omega-3s clearly have an important role to play here.

Are we missing a chance to increase intake?

The all-round health benefits of omega-3s have a lot to offer consumers of all ages. So why is consumption still so low? This awareness-behavior gap can be explained by a number of purchase barriers. For instance, large pill size and fishy smell or aftertaste can be off-putting. A lack of awareness of the consequences of omega-3 deficiency, as well as mixed messages about omega-3 health benefits and the fact that the consumers may not be able to 'see' or 'feel' the benefits are all likely to contribute to sub-optimal intake. For environmentally-conscious consumers, a lack of vegetarian options and sustainability concerns may also be important factors in their purchasing decisions.

Dive into an ocean of omega-3 opportunities

With over 20 years' experience in omega-3 innovation, DSM is committed to helping brands and manufacturers create high-quality and sustainably-sourced omega-3 solutions that support health and wellbeing throughout life.

DSM's *life's™OMEGA* is a unique, 100% plant-based alternative to fish oil contain-

ing a minimum of 500 mg/d of EPA and DHA (with a combination of 150 mg/d EPA and 300 mg/d DHA minimum). The first and only commercially available plant-based omega-3 to deliver the health benefits of EPA and DHA in a single source, *life's™OMEGA* helps to attract a new generation of health- and environmentally-conscious omega-3 consumers.

The latest addition to DSM's nutritional lipids portfolio is *life'sDHA®* SF55-O200DS – the only 550 mg/g natural triglyceride DHA intended for use in maternal nutrition. This high-potency DHA oil is a plant-based omega-3 that offers mothers peace of mind throughout pregnancy and beyond, supporting full-term pregnancy and providing the safety, convenience and efficacy that they need. ●

For more information on how DSM's portfolio of nutritional lipids can help you deliver omega-3 EPA and DHA solutions that support health throughout life, visit www.dsm.com/lifes-omega

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CONFIDENCE OVER IMMUNE HEALTH ON THE DECLINE



The wide-ranging and devastating impact of COVID-19 has resulted in consumers re-evaluating their health and wellness, as they become increasingly concerned about the risk of vulnerability to disease and illness. Consumers recognize that good immune health is central to overall good levels of health and wellness, this is why in the last twelve months, there has been a decline in the proportion of consumers satisfied with their immune health whilst a considerable rise in those taking proactive steps to improve immune levels. Consumers are prioritizing adjusting their diets in order to do this. However, a considerable proportion of consumers are also looking to improve their mental wellbeing and energy levels as they recognize this has a direct impact on immune health. Whilst demand for immune health products will increase over the next couple of years, it is crucial that products are not making misleading claims or are positioned as magic bullet health solutions

As consumers adjust themselves to what they deem to be the new normal, they are re-evaluating their health and wellness. This is being triggered by consumers questioning how long they will be subject to the impact of COVID-19 and in addition, whether such airborne, respiratory diseases will become more common because of the nature of modern life. In 2019, FMCG Gurus research found that 54% of consumers said that

they were satisfied with their immune health. This shows that whilst consumers recognize that they could make improvements to their diets and lifestyles, overall most consumers indicated that they were happy with their immunity levels. However when the same question was asked twelve months later, only 49% of consumers said that they were satisfied with their immune health. In addition, research conducted by FMCG Gurus over the period April-July 2020 found that overall, 60% of consumers said that they had become more conscious about their immune health throughout the pandemic. This shows that concerns about vulnerability to disease and illness, as well as serious health complications arising from the virus are not just restricted to those associated with more vulnerable demographics such as the elderly.

Given that 52% of consumers believe that the virus will continue to impact on daily lives for at least twelve months, they will make more conscious attempts to improve their health and wellness. Indeed, 81% of consumers say that they will now make greater attempts to lead a healthier lifestyle as a result of COVID-19. This will be driven to some extent by consumers also recognizing that current diets and lifestyles are not as healthy as they could be, something that could lead to health problems later in life. More noticeably, FMCG Gurus Immunity survey conducted in 2020 found that 70%

of consumers said that they had made changes to their diets and lifestyles in order to boost their immune health, considerably up from the 53% who said this a year earlier. This shows that for many, protecting immune health is no longer something that is aspirational but is something of a necessity to minimize vulnerability to disease and illness.

When making changes to their lifestyles in order to improve immune health, consumers are most likely to adjust their eating and drinking patterns. For instance, FMCG Gurus COVID-19 survey series found that on average, a total of 43% of consumers said that they had made greater efforts to seek out functional food and drink products. In comparison only 14% said this in relation to nutritional supplements. Additionally, of the seven in ten consumers who said they were taking steps to boost their immune health in 2020, 76% said that they had made changes to their diets. When looking to adjust their diets, consumers are just as likely to say that they are reducing their intake of bad ingredients (sugar -66%) as they are increasing their intake of good ingredients (protein - 64%). This shows that for many consumers, moderation and avoidance of perceived dietary evils will be just as important as seeking out ingredients that are associated with offering a health boost beyond basic nutrition. The importance of sugar reduction will be linked to high levels of awareness about the link between obe-

60%

Of global consumers said that they had become more conscious about their immune health throughout the pandemic.

81%

Of consumers say that they will now make greater attempts to lead a healthier lifestyle as a result of COVID-19.

sity and increased risk of complications arising from COVID-19.

Interestingly, of those consumers looking to improve their immunity in 2020, 61% said that they were looking to improve their energy levels whilst 53% said that they were aiming to improve their mental wellbeing. Increasingly, consumers are recognizing that all aspects of health are interlinked and should not be treated in isolation. Additionally they recognize that poor mental wellbeing and fatigue is something that can have an impact on health beyond influencing mood and levels of activity and directly impact the immune system. In recent years, the proportion of consumers suf-

fering from stress, fatigue, and anxiety has increased. This in turn has directly impacted on sleeping habits and ability to relax. In 2020 and beyond, high levels of uncertainty means that levels of mental wellbeing will continue to be impacted. For instance, consumers are living in constant worry about the health and wellbeing of loved ones, the economy, and new waves of the virus and the disruption this will bring to modern life. As such, consumers will place more emphasis than ever before on protecting their wellbeing as they look to maximize health.

Increased awareness and concern about immune health is something that creates new opportunities from a new product development perspective. For instance, FMCG Gurus COVID-19 survey showed that consumers associate a variety of ingredients with helping boost immune health such as iron (82%), Omega 3 (79%), vitamin C (79%), and probiotics (75%). This shows that there is an opportunity to launch functional products around these ingredients, taking inspiration from the health halo that surrounds the protein market and positioning products as something that not only reduce the risk of illness but also increase ac-

tiveness and happiness.

The reality is that concerns about immune health will not reside in the near future. This means that consumers will continue to take a proactive approach to improving health and wellbeing and seeking out products that help facilitate this. Whilst this is something that creates an opportunity for food, drink, and supplement brands, it is crucial that claims around products are transparent. Indeed, consumers can often be skeptical of claims made by brands, especially when it comes to health and wellness, believing that brands can make misleading claims in order to capitalize on consumer desperation to boost health. As such, it is crucial that any claims around functional products are seen to be transparent and accurate and products are not positioned as magic bullet health solutions. ●

This article is based on the following survey

- FMCG Gurus Immunity survey series, Q2 2020
- FMCG Gurus Immunity survey series, Q3 2019
- FMCG Gurus – COVID-19 survey series, Q1/Q2 2020

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INS FARMS LAUNCHES FARM TO FINISH ELDERBERRY INGREDIENTS

INS Farms has entered the natural health ingredient supply industry with its elderberry line of versatile raw materials. The company was founded by CEO Devon Bennett and partner Brittany Lueckenhoff, and is the largest grower/processor and supplier of black elderberry (*Sambucus nigra*) in North America.

INS Farms incorporates five distinct ingredients:

- Whole fruit elderberry powder
- Organic Elderberry Juice Powder 100% water soluble with no additives
- Elderberry Seed Oil
- Elderberry Liquid Extracts Syrup
- Black Elderberry Extract Powder

"Elderberry's time in the marketplace is here and it is something we have been preparing for," said Bennett, who initially began operating with the berry three years ago as a partner with a consumer brand.

"At that time, maybe 20% of the people we met at trade shows were familiar with elderberry as a consumable product. However now in 2020 thanks to covid-19, several mommy bloggers and the circulation of natural remedy stories online, most people have at least heard of elderberry before. As a grower and vertical elderberry supplier, we are heavily

emphasizing the widespread benefits of elderberry."

Bennett and his team began planting American elderberry in 2013 and founded INS Farms in 2015. He now has more than 100 acres of the sought after super fruit, with another 160 acres in development.

It takes between four to five years for the mature plant to provide nutrient-rich elderberry, he noted. "We have guaranteed sustainability and supply. We have standardized our berries. The North American black elderberry has the same quality as the European black elderberry, but it is distinctive in that it has a unique DNA biomarker."

Bennett and his team have funded testing of their own berries and have qualitative research to illustrate their properties.

INS Farms is a vertical supplier of pure elderberry ingredients, and it owns a processing center that performs juicing, concentrating, drying and cold storage, for a wide variety of consumer product applications.

"Our elderberry powders have many more attractive uses beyond just cough/immune-boosting syrup," Bennett commented. "We like to say our elderberry is good for everyone, every day."

Elderberry is suggested by science to be viable for use to manage cholesterol,

boost immunity via its antioxidant activity, support healthy vision, and protect heart health. Elderberries contain vitamins A, B, C and E as well as polyphenols and proanthocyanidins. ●

For more information, visit:
www.qualityelderberry.com



About INS Farms

Located in Purdy, MO, INS Farms is the largest grower, processor and supplier of black elderberry (*Sambucus nigra*) in North America. INS Farms is a vertically integrated, sustainable company that controls the quality from seed to manufacturer and provides a guaranteed supply of quality elderberry all year round. The company has the distinction of being the fastest growing black elderberry grower and processor in the United States.



INS FARMS Elderberry every day for everyone

- Largest grower, processor, supplier of Black Elderberry (*Sambucus Nigra*) in North America
- Farm to table, vertically integrated, sustainable
- Complete transparency & traceability
- DNA tested for authentication by TRU-ID
- American grown. Produced in U.S.A.

Our ingredients Organic & Conventional



Elderberry whole fruit powder 65:1

Elderberry Juice Powder / No Carriers 65:1

Elderberry Liquid Extract / Alcohol Free 15:1

Elderberry Seed Oil / Omega 3,6,9, 7 / 95% Fatty Acids

Elderberry Purified Extract Berry Shield 10:1

...all ingredients standardized for anthocyanins and polyphenols

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Immune Health: Opportunities Abound for Natural Solutions

Immune health was an important and growing concern even before the 2020 pandemic, and it is now inconceivable that the importance of immunity support could diminish in any short term.

A MarketPlace study conducted in the Fall of 2019 verified that immunity ranked fifth on the list of consumer demands relative to 20 other health categories. In June 2020, when they did a follow-up study, immunity moved into the third spot, following prevention/overall wellness and gut/digestive health¹. Also in the June study, 61% of U.S. dietary supplement consumers said they have increased the use of dietary supplements to help support immunity.

With school closings, travel restrictions, concert and sports venue closures and a large part of the population working from home, we live in a world much different than in years past. Now there is a more persistent and urgent search for ingredients and products that support immunity. Consumers are proactively looking for what they can do to manage their health beyond social distancing, face coverings and hand washing. While demand for immune support has

traditionally been seasonally influenced, we are now taking more proactive action, and seeking more natural products and long-term solutions to health and wellbeing.

Consumers are also showing interest in immunity with their wallets. For the year ended (Y/E) Mar. 22, 2020, U.S. total mass multi-outlet (MULO) and convenience store dollar sales of immunity products jumped 199% and vitamins were up 77% according to IRI's Apr. 4 COVID-19: Economy Report. It also reported that the number of immunity product buyers in the U.S. increased by 125%.

Interest in, and purchases of, immunity products – in particular those touting clean label, natural, plant-based, sustainable ingredients – is surging across all age groups. Millennials, Gen X, and Boomers alike, are searching for effective solutions and support.

Consumers now have more access to data than ever before. 70% of Americans use the internet to get health information and make health decisions – and they are taking a proactive stance like never before in researching and managing their own health.

Sustainability-marketed goods are still highly valued, and brands should understand the sustainability practices of its suppliers. One study conducted in June 2020, in partnership by The NYU Stern Center for Sustainable Business and IRI®, tracked changes since its 2019 analysis that examined consumer purchases of sustainability-marketed goods. This study reported that on average, across 35 CPG categories examined, sustainability-marketed products enjoyed a sizable premium of 39% over conventionally marketed products². It also revealed that sustainability-marketed products grew over seven times faster than conventional products, demonstrating consumers' strong preference for these products and their general willingness to pay higher prices.

Looking across a variety of indicators – from Amazon best selling lists to Google Trends, industry reports spanning nutraceuticals, food, beverage, and personal care, and the demand we see at Layn Natural Ingredients, some key botanical ingredients trending globally in the popular immune-support space, include:

- Andrographis
- Broccoli Seed

- Cistanche
- CBD
- Echinacea
- Elderberry
- Ginger
- Grape Seed
- Green Tea
- Honeysuckle
- Pu'er Tea
- Quercetin
- Reishi Mushrooms
- Resveratrol
- Rhodiola
- Rice Bran
- Rosemary
- Schisandra
- Sea Buckthorn
- Seaweed

Some of these ingredients, such as Echinacea, Elderberry and Resveratrol, are well-known for their immune support potential. Others are gaining new awareness due to entry into new markets, increasing science and broadening consumer awareness. Some noteworthy examples that offer brands high differentiation opportunity, include:

Cistanche, which is also commonly known as desert ginseng, is a unique botanical that grows in dry conditions around the world. Its immune enhancing and anti-aging properties have been studied for its beneficial effects on macrophage production which is critical to immune function³.

Pu'er Tea pronounced "poo-air" is a special form of fermented green tea that originated in the Yunnan province of China. It's usage in stimulating the immune system along with many other health benefits has been used for thousands of years as part of Traditional Chinese Medicine. Pu'er tea, like Cistanche, helps to support healthy macrophage production an important component of the immune system⁴.

Broccoli Seed is a potent source of glucoraphanin – a glucosinolate that is converted to sulforaphane in the body. Sulforaphane is a powerful antioxidant that has been demonstrated to help support healthy immune function⁵.

Honeysuckle has demonstrated new potential for immune support. One study found that Honeysuckle (*Lonicera*

“

ONCE A SEASONAL CONCERN, THERE'S NOW PERSISTENT DEMAND FOR EFFECTIVE, NATURAL IMMUNE SUPPORT

caerulea L.) shows high health potential and is a promising source of numerous bioactive compounds, mainly anthocyanins, phenolic acids and flavonols and the unique presence of iridoids, which have demonstrated anti-inflammatory and antioxidant capabilities⁶.

Quercetin from *Sophora japonica* is a flavonoid found in many fruits and vegetables that has been studied extensively for its antioxidant and immune boosting properties. It also supports a healthy inflammatory response which is of significance due to the effects that inflammatory cytokines can have on the immune system⁷.

We continue to see a broadening of the nutraceutical and sports nutrition markets into mainstream segments, and food and beverage seeking more function. There is increasing demand for delivery formats that work with their lifestyles. Increasingly, consumers want their supplements in convenient, familiar and preferred formats, which today can include everything from gummies and chewables, to snacks and ready-to-drink beverages. While currently, there is still a slight preference for supplements in pill form, this is declining. A recent MarketPlace study reported that preference for pills over functional foods specifically for immune support has declined from 89% in 2019 to 72% in 2020¹.

The use of botanical ingredients in trending delivery formats requires expertise, and can present formulation challenges. Brands developing these products should carefully consider:

- Proper/recommended dosages and levels of botanicals and active ingredients
- The efficacy of health support and

other functional benefits consumers seek

- Achieving desirable taste, aroma and texture
- Preservation and shelf-stability
- Special dietary preferences and intolerances
- The importance of ingredient and production transparency and accurate labeling

For over 25 years, Layn Natural Ingredients has been innovating and investing in advanced R&D efforts to develop standardized botanical extracts tailored for specific markets, formats and applications. In addition to its leadership in sustainable agricultural practices, innovation, and extraction methods, it also brings a depth of formulation experience and works closely with manufacturers and formulators to find unique solutions, overcome challenges, and achieve functionality goals while meeting customer demands. ●

About the Author

James Roza is Chief Science Advisor at Layn Natural Ingredients-USA. For over 30 years he has driven and directed research, product development and quality assurance for leading nutraceutical manufacturers, and has been instrumental in establishing standards in the natural products industry.

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HOT OR NOT?



A SUSTAINABLE, COST-EFFECTIVE ALTERNATIVE TO OVERCOME THE CHALLENGES OF PEPPER EXTRACTS

By Cai Berg, CEO Berg Nutrition

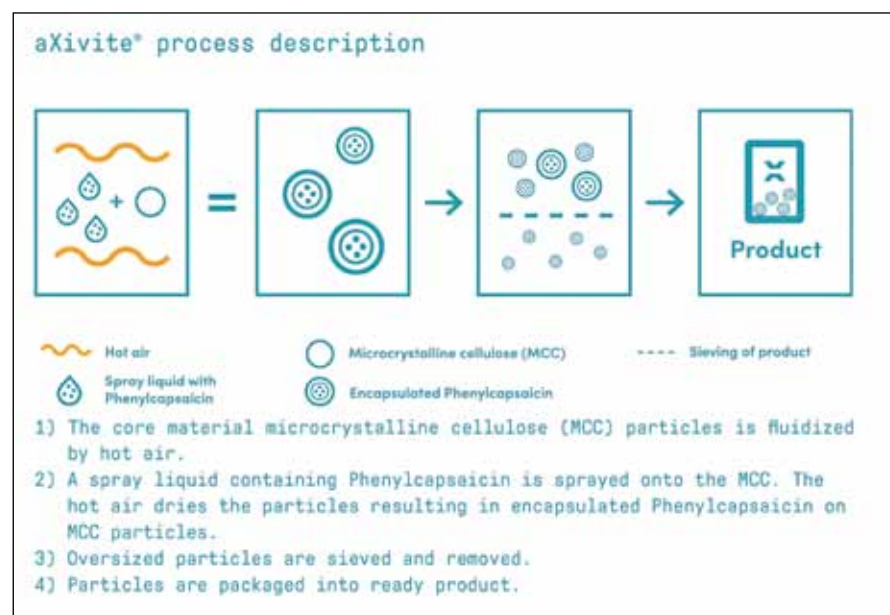
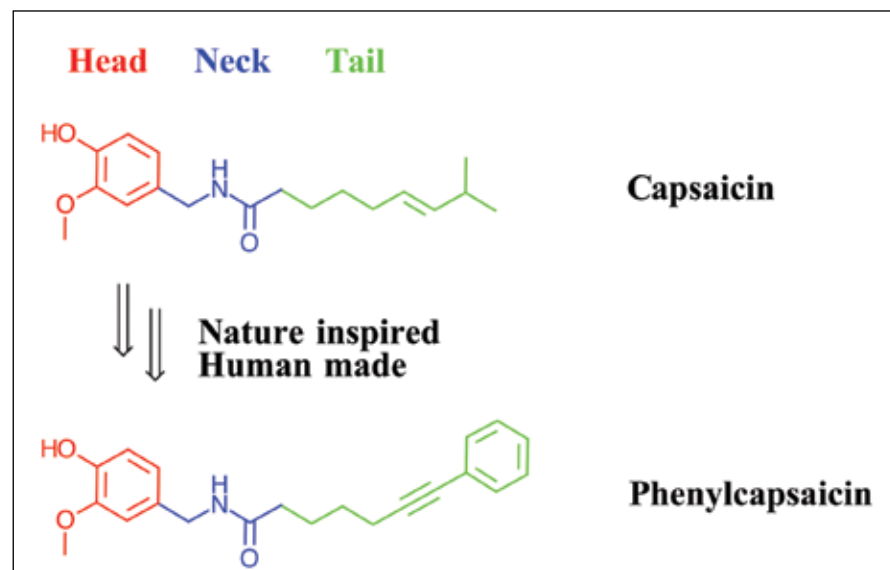
Capsaicin, the active ingredients in chili peppers, is widely recognized as effective natural ingredient for a variety of applications including topical pain management, cardiovascular support and weight control. The benefits don't stop there, but complications with the compound have restrained its potential. Until now.

Phenylcapsaicin, a patented synthetic analog of the primary capsaicinoid from chili pepper, shows promise to improve the functional properties of capsaicin for both formulators and consumers. The flagship nutraceutical release from Swedish biotech startup aXichem, aXivite represents the first real advancement in decades.

What is Phenylcapsaicin?

Put simply, phenylcapsaicin is a new proprietary analog of capsaicin in which a naturally occurring phenyl group is used to stabilize nature-identical capsaicin. Introducing a triple bond within the phenyl group offers several benefits to the naturally occurring analog.

The resulting molecule displays higher activity as a TRPV1-agonist compared to natural capsaicin extracts. It is delivered at minimum 98% purity versus the relative low concentration and purity of conventional capsaicinoid extracts, which carry other capsaicin analogs (dihydrocapsaicin, nordihydrocapsaicin, etc.) and significant impurities. And →



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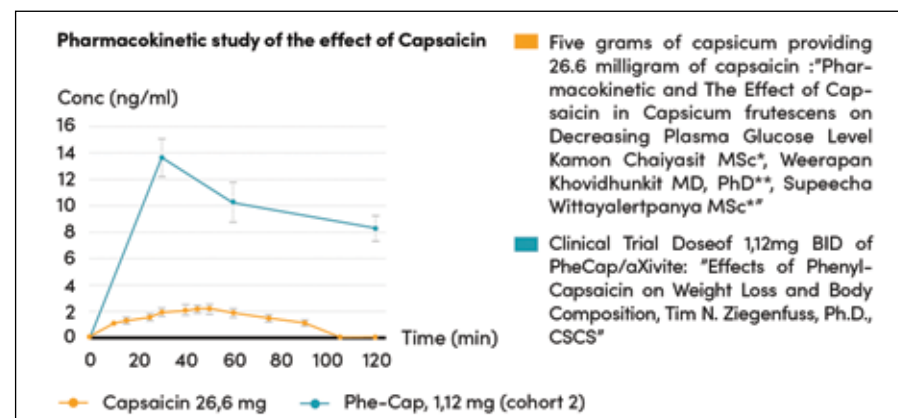
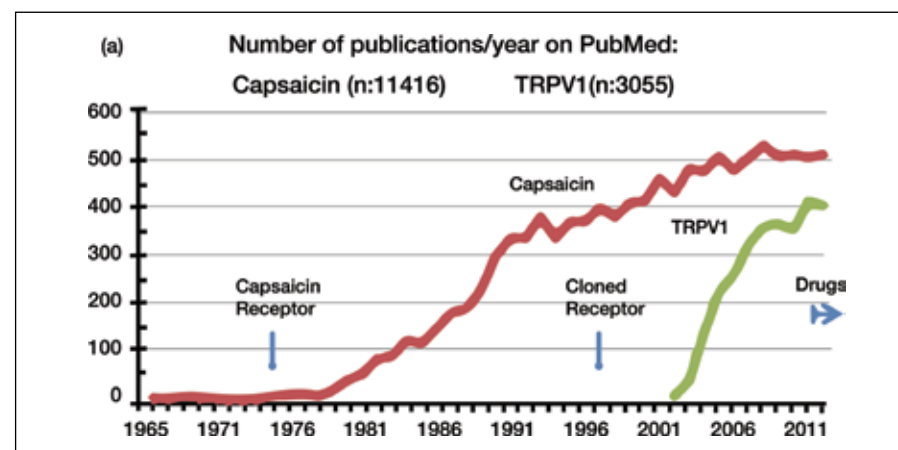
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while it takes 1 kg of chili peppers to produce just 250 mcg of capsaicin, phenylcapsaicin is produced with precision control through a cost-effective, scalable process that reduces environmental impact and eliminates the agricultural uncertainties of pepper-derived extracts.

Benefits of Phenylcapsaicin

- Enhanced bioactivity (TRPV-1-agonist)
- Optimized manufacturing process
 - Safety
 - Scalability/Reduced Cost
 - Patented
 - Minimal environmental impact

What is aXivite?

Providing 98% microencapsulated phenylcapsaicin, aXivite is a free flowing highly stable powder. It is certified by the European Food Safety Authority (EFSA) as a novel food ingredient and is self-affirmed as Generally Recognized as Safe (GRAS) in the US for up to 2.5 mg per day.

To formulators, aXivite is a free flowing, highly stable powder that provides real advantages over conventional pepper extracts. At 98% purity, it is literally over 10 times more potent than the USP standard of 8%. Plus, the 8% stand-

ard does not specify capsaicin, which means that you're getting other capsaicinoids, phospholipids, oleoresins and more within that concentration. This branded ingredient also delivers pure phenylcapsaicin absent of pesticides, toxic metabolites and other impurities.

To consumers, aXivite is a free flowing, highly stable powder that provides the advantages of enhanced bioactivity, higher bioavailability, reduced pungency, improved tolerability and better safety. It is vegan-friendly, allergen free and cost effective.

The Science of Capsaicin

Few natural products have been as widely investigated as capsaicin, which has been investigated in research published over the past 50-plus years. The primary areas of investigation have been in cardiovascular health — specifically blood pressure — along with weight loss and the mitigation of inflammatory and neuropathic pain.

Capsaicin works by activating the TRPV1 receptor, also known as the capsaicin receptor. TRPV1 is a non-selective cation channel, which makes it particularly

interesting as bio-enhancing receptor for carrying a wide variety of molecules into the body. Peer-reviewed pharmacokinetic research by aXichem has confirmed that phenylcapsaicin is in fact a true capsaicin analog that stimulates this specific receptor channel to great effect. The graph below illustrates the high bioactivity of phenylcapsaicin versus conventional capsaicin.

The next frontier in capsaicin research and application will be in the fast-growing category of gut health according to aXichem. In vitro and animal studies have already demonstrated that capsaicin and phenylcapsaicin may positively impact biomarkers related to leaky gut syndrome. There's also evidence that capsaicin may support the health of the gut microbiome for support of healthy immune functions. Further studies sponsored both by aXichem and independent entities are underway.

The Hottest "Not-Hot" Capsaicin Alternative

One of the greatest challenges of capsaicin supplementation is tolerability. Many people report having intolerance to certain parts of the chili pepper, which is another reason why aXivite phenylcapsaicin is beneficial and efficient as it provides the pure capsaicin without introducing the irritating and potentially toxic components of the chili pepper. With four times the bioactivity of conventional capsaicin extracts and more than 10 times the concentration of standard powdered ingredients, aXivite phenylcapsaicin is a safer, more tolerable, cost-effective solution with multiple advantages for manufacturers and consumers alike. ●



Cai Berg is the founder and CEO of Berg Nutrition, a specialty nutraceutical distributor representing select European manufacturers in the U.S. market. A native of Germany, Berg has spent over two decades building strong relationships with manufacturers and suppliers in Germany, Spain, Norway and beyond, helping European companies understand and break through the unique challenges of the American marketplace.

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