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what do consumers expect from plant-based solutions?

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**FROM HEALTH APPEAL TO TEXTURE: WHAT DO CONSUMERS EXPECT FROM PLANT-BASED SOLUTIONS?**

**Foreword by Chris Lee,**
Managing Director, Health and Nutrition Network, Europe, 
at Informa Markets

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As readers of this publication will be aware, the plant-based food market has witnessed a sharp growth in demand worldwide as awareness of the benefits of alternative diets rises. On a mission to live a healthier lifestyle with minimal impact on the planet, consumers are increasingly limiting their animal product consumption to follow a wholesome diet, such as flexitarian, vegetarian or veganism. Alternative food options are, as a result, growing in popularity, presenting an opportunity for food, beverage and supplements manufacturers to tap into the plant-based trend.

Questions, however, remain over the quality, taste and texture of these solutions.

The rise of plant-based

Plant-based alternatives span across a number of industries, with substitutes available for anything from meat and dairy to vitamin ingredients and capsule coatings. The strong growth shown by these markets is remarkable; the dairy-free market, for example, expanded from approximately US$2 billion in 2013 to an estimated US$7.3 billion in 2018 and is expected to reach US$29.6 billion by 2023. Similarly, the meat-substitute market has shown exceptional growth. In 2012, the total sales of plant-based proteins amounted to US$7.3 million, but by 2019, the value of this market had jumped to US$16.6 billion. Growing at a compound annual growth rate (CAGR) of 12%, it is anticipated to reach US$35.5 billion by 2026.

The challenges ahead

A driving force behind this growth is consumers’ increased awareness of the potential health benefits of a reduced meat diet combined with a better understanding of the environmental impact of consuming animal products, and the rise in demand for plant-based solutions shows no sign of slowing down. However, producers are now under pressure to develop products that provide the quality, taste and texture expected by consumers. 15% of global consumers now identify as flexitarian, which means they limit — but not eliminate — meat from their diet. Combine this with the 23% of global consumers who are concerned about the taste of plant-based food, and it becomes clear that producers must create plant-based substitutes that provide an eating experience that matches that of eating meat if they are to succeed in an increasingly crowded marketplace.

In addition, manufacturers must align their products with the health-positioning expected by today’s discerning consumers. Given their motivation to go animal-free to follow a wholesome diet, people are unlikely to purchase plant-based alternatives for meat or dairy if they are heavily processed or contain large amounts of salt, sugar or fat. A UK-based study, for instance, found that 28% of meat alternatives are neither low-salt, sugar or fat. A UK-based study, for instance, found that 28% of meat alternatives are not considered clean by consumers.

The health halo effect currently observed in the plant-based food, beverage and dietary supplements markets — whereby buyers believe that these options are healthier simply because they do not contain animal products — is likely to fade in the light of the clean label movement. Predominantly an industry-led term, ‘clean label’ describes consumers’ wish to understand what is in the products they purchase, with an ever-rising number of people checking product labels for both ingredients they are familiar with and those they recognize to be healthy. This means that producers must ensure the health factor associated with plant-based alternatives can live up to the expectations of an increasingly critical society to not only meet demand, but establish an industry-leading position.

At this year’s Vitafoods Europe, we are aiming to provide a platform that encourages the industry to come together and develop practical solutions for a variety of challenges, including how to create plant-based foods, beverages and dietary supplements that create a strong appeal and ensure optimal health for consumers. As a meeting point for the nutraceutical community and with over 25,000 industry experts set to attend, Vitafoods Europe 2020 will allow all stakeholders to easily navigate the plant-based domain — using science to fuel product innovation and development. We hope you will be able to join us in Geneva in September and look forward to as many of you as possible joining the debate.

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Nutraceuticals Now
COVID-19: WHERE NEXT?

Now on the world stage, Covid-19 has passed the containment stage, and political and health care systems everywhere have moved directly to disease management. This was largely inevitable, given the viral attributes of high transmission rates and long incubation, and the common political tendency to normalcy bias.

Some nations have relied on contact tracing and lockdown to slow the increase in affected cases, essential in preventing hospital overload and — hopefully — in staring the virus of fresh victims. China appears to have done so fairly successfully, effectively militarizing their viral control effort in tandem with sophisticated online tracing and contact tracing tools available via WeChat. South Korea has been able to achieve something similar, combining sophisticated tracing tools with a highly educated, motivated and relatively homogenous population who were willing to take appropriate actions such as self-isolation and, where necessary, self-reporting.

It remains to be seen if nations in Europe and North America will be able to follow suit. France has joined Italy in imposing a national lockdown; and Germany, Austria and Denmark have joined the Czech Republic, Hungary, and Poland in closing their borders. The Czech Republic has also joined in the mass quarantine movement, sealing off some towns entirely.

The problem with lockdowns, is that it is rarely completely effective, and infection may reappear once social conditions are normalized. Other nations have chosen a different path, with the UK in particular having decided to opt for herd immunity. The aim here is to trade larger numbers of initial cases with a longer-term reduction, achievable once 60% or more of the herd have been exposed and gained a degree of resistance to the virus. The problem with this approach, however, is that no one yet knows how many recovered individuals generate strong and/or permanent immunity. Initial reports indicate that after Covid-19 infection, immunity may not always be strong or long-lasting and if these reports are representative, effective herd immunity may not be achievable. Viral mutation, as occurred with the 2012-13 influenza and may have already occurred with Covid-19, can also undermine the herd immunity strategy.

Both of the above options incur significant economic costs, due to disruption of supply chains and working patterns, and some believe that these may be so severe as to impact health statistics even more profoundly than the disease itself. There is a growing need, therefore, to shift resources to acute and to systemic disease treatments.

There will always be a place for symptomatic approaches: decongestants, IV drips, nasal washes and in severe cases ventilators and antibiotics. But, it is still evident that more fundamental strategies are needed to protect our national health. Which brings us to the anti-virals, and the vaccines.

Initial promising reports of using combined antiretrovirals and neuraminidase inhibitors continue to be investigated, and more recent reports on combinations of antiretrovirals and anti-malarials and/or remdesivir, are being evaluated. The anti-malarial hydroxychloroquine is increasingly being reported by scientists as a promising candidate for both prevention and treatment. Yet, data collection is at an early stage, and definitive efficacy remains to be proven. A number of vaccines are in prototype production and pre-clinical testing; with at least one vaccine already used in individual patients, but here again there is insufficient data at the time of writing to issue clinical guidelines or recommendations.

Going back to the basic epidemiology, it is known that 80-85% of infected individuals suffer only minor symptoms and do not require hospitalization. While size of inoculum may play a role here, the functionality of the innate immune system and the presence or absence of comorbidities appear to be the critical determining factors. In both of these, factors nutritional status plays an absolutely crucial role, and this opens the possibility of using nutritional tools to increase the size of the group who experience only mild illness, and reduce the numbers requiring hospitalization to more manageable levels.

The disease progresses through a series of stages. It begins with a virusemia lasting 7 to 9 days, which is associated with relatively nonspecific symptoms such as nasal discharge, sore throat and mild fever. In 80-85% of cases the disease does not progress beyond this point, because the innate immune system succeeds in overwhelming the viral challenge. In approximately 35% of cases the innate immune system fails to contain the virus and the disease progresses to a mixed viral and bacterial pneumonia; and finally to a mixed viral, bacterial and cellular pneumonia, as the immune system breaks down and inflammation overwhelms the patient.

Food and food components have always played a preventive role in human health and such nutritional approaches can be manipulated to intercept and treat health conditions. Further botanical extracts have played a role in immune health across all tradition and medical treatments. For instance, Cinchona gave us Chloroquine that is being considered with great interest in the management of the current COVID-19 epidemic. Shikimic acid from star anise inspired the development of Tamiflu. Various elements of the innate immune system can be enhanced using supplements such as the 1-3, 1-6 beta glucans and dietary pre-biotics such as the fructooligosaccharides. Numerous supplements have anti-inflammatory properties, such as the GLA fatty acid, and the botanical ascorbic acid (Vitamin C).

The effectiveness of such programs are not yet proven, but they are supported by circumstantial evidence and unlike the traditional pharmaceutical approaches, they have very wide therapeutic indices. This makes them eminently suitable for general usage, and for consideration as a mainstream of preventative health strategies going forward.

More research is currently being undertaken on the role of both dietary and pharmacological approaches, in exploring the potential of the probiotics in modifying the pathogenic properties of gut bacteria and in enhancing the immune response.

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4. (Pea) is another such constituent of food—phytosterols (sterol) and...
ARE CONSUMERS LOOKING TO IMPROVE THEIR IMMUNE SYSTEM

The following are based on our Q3 Global Immunity Surveys - 26,000 respondents.

25% Of consumers feel that their immune system is poor or very poor.

61% Of consumers think that a poor immune system means being susceptible to day to day illness such as catching a cold.

53% Have changed diets to improve immune system.

63% Have eaten more fresh food and vegetables.

63% Have increased their protein intake.

What actions are consumers taking to improve their immune system.

89% Of consumers associate iron with immune improvement.

3 in 10 Feel their immune system has worsened in the last 2 years.

35% Are not suffering but wanted to take a proactive approach to their health.

CANNABIDIOL (CBD) FROM HEMP, THE RISING STAR MOLECULE FASCINATING THE NATURAL MARKETS. A VIEW FROM EUROPE

By: Dr. David Daguet, PhD Scientific Director david@vidya-europe.eu

CBD, the iconic representative compound of Cannabis sativa, is the subject of a captivating trend, but this substance and the very exciting opportunities it brings is still facing barriers worldwide. Hemp is becoming a significantly interesting raw material for different reasons. Several ingredients with health benefits have been identified in all parts of the plant. Owing to the seeds, hemp oil and hemp proteins present high nutritional values, while the stems can be used to produce eco-friendly insulation for houses. Regarding physiological properties, the flowers produce compounds called cannabinoids, such as the well-known CBD or THC. Over 100 cannabinoids have already been identified, and very recently two new cannabinoids have been discovered, one of them being much more psychoactive than the well-known THC.

Last but not least, one major key advantage of hemp is its limited environmental impact and feasible agronomical properties, making its cultivation a valuable diversification of agriculture. Hemp cultivation could become a new source of work and income for farmers.

A lot of confusion, despite promising health benefits

Even if the frontiers between the pharmaceutical and nutraceutical, not to mention physiological, properties of CBD must be disentangled, clarification must also be provided in communication concerning hemp cannabinoids. Despite its promising and innovative components, hemp is harshly and inconsistently regulated in the European Union, for example. To illustrate this purpose, it should be considered that in France, crops are strictly regulated and only 20 varieties of hemp are authorised to be grown. These controlled varieties are characterised by less than 0.2% THC and a low amount of CBD, leading to THC-free oils and proteins naturally containing very low levels of cannabinoids such as CBD. A low natural level of cannabinoids in the final products is the result of traditional transformation processes, and not intentional enrichment. Based on this very strict traceability, Vidya is able to produce hemp seed oil with high nutritional values and proteins with no THC and naturally low level of residual cannabinoids.

Hemp seems to suffer from an undeserved ‘bad’ reputation. Indeed, despite the fact that CBD is not psychoactive and has been used for more than 50 years in some countries for its health benefits, media and consumers still confuse CBD and the psychoactive compound THC.

Regarding the health benefits of CBD, it seems that CBD may help to manage anxiety and mood disorders. The anxiolytic effects of CBD have been extensively demonstrated in animal studies and in healthy volunteers subjected to anxiety induced by several situations including the simulation of public speaking, for example. More precisely, CBD seems to act on the reduction of anticipatory anxiety. A recent clinical study conducted in Japan confirmed the very interesting anxiolytic activity of CBD on a specific population of teenagers with social anxiety disorders. After only 4 weeks, the evaluation in the form of a questionnaire showed that CBD decreased their anxiety.

Due to its anti-inflammatory properties, CBD seems to indicate positive results for the relief of joint pain, even if more studies are needed to clarify the mechanism of action and the active dosage. The analgesic property of CBD is often used in pharmaceutical products in association with THC. The analgesic property of CBD, as well as its aryltetrahydrocannabinolic property have been confirmed in a study on 397 subjects conducted in New Zealand, but with limitations due to individual reactions to the treatment.

The long-term uses of hemp extracts, for health purposes associated with the treatment of diseases that are aimed at improving a patient’s quality of life, are still not globally recognised. Dravet syndrome or resistant epilepsy may be alleviated by CBD, interestingly, in the context of refractory epilepsy treatment. CBD-rich extracts seem to present a better therapeutic profile than purified CBD, at least for the population of patients studied with refractory epilepsy. The roots of these differences are likely due to the synergistic effects of CBD with other phytocompounds. CBD is currently used by people suffering from multiple sclerosis. Effectively CBD could be advisable to reduce fatigue, pain, spasticity, and ultimately improve mobility. Because of an ageing global population, CBD’s ability to provide neuroprotection should also be considered. As described above, CBD could be a valuable natural alternative for epilepsy and multiple sclerosis providing more comfort in patients’ lives and it may also provide beneficial effects for those with Alzheimer’s disease and Parkinson’s disease.

Which regulatory status for CBD?

CBD is a very promising compound for the nutraceutical market, due to its numerous potential health benefits, but it is also used and coveted by the pharmaceutical industry. The criteria required for the future authorisation of CBD in nutraceutical products are of two main considerations:

The physiological properties and related health benefits provided by CBD, independently of therapeutic properties.

And the authorised dosages enabling the physiological health benefits, which are lower than the pharmaceutical ones.

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There is no shortage of examples in the current regulations to pave the way for CBD, like with ascorbic acid. At high doses of often more than 1,000 mg/day, ascorbic acid, better known as vitamin C, is a medicamental product, while at lower doses compatible with Recommended Daily intakes, it is a food supplement. And finally, at a very low dosage, it is the food additive E300, an antioxidant that protects foods.

Then the debate could focus on determining what dosage of CBD should be classified in each type of use. Despite their various interests and promises, CBD and hemp are still facing opinion and regulatory barriers in Europe. Now allowed in several states of the US, although uncertainties still remain at a national level, there is no doubt that CBD will be authorised both in Europe and in North America.

Spotlight on the regulatory status of CBD in Europe

Very recently, CBD has been classified as a Novel Food, but with some restrictions concerning products derived from Cannabis sativa. "Some products derived from the Cannabis sativa plant or parts such as seeds, seed oil, hemp seed flour, defatted hemp seed have a history of consumption in the EU and therefore, are not novel. Other specific national legislation may restrict the entrance into the market of this product as a food or food ingredient in some Member States. Therefore, it is recommended to check the status of Cannabis sativa with the competent national authorities" (EU Novel Food catalogue). The Novel Food Catalogue states on cannabinoids 2018;1:65–72.

The Novel Food Catalogue states on cannabinoids including CBD: "extracts of Cannabis sativa L. and derived products containing cannabinoids are considered novel foods as a history of consumption has not been demonstrated. This applies to both the extracts themselves and any products to which they are added as an ingredient (such as hemp seed oil). This also applies to extracts of other plants containing cannabinoids. Synthetically obtained cannabinoids are considered as novel". Considering the two above statements concerning products derived from Cannabis sativa and cannabinoids; hemp seeds, flour and seed oil remain excluded from the categorisation of Novel Foods if cannabinoids have not been added as ingredients. Consequently, traces of cannabinoids, but with undetectable THC, are then authorised because they have not been added as an ingredient.

This information should be treated with caution as the Catalogue has no legal status. In practice, it is the national authorities that have the final say on whether foods containing CBD may be placed on their market with a varied range of decisions. For example, in Ireland, the authorisation of CBD products will be based on the manufacturing process applied; oil prepared through the cold pressing of hemp seeds may be sold on the basis that this oil contains low levels of CBD. In contrast, Belgium does not authorise products that contain CBD.

Vidya is currently working with the professional union Synadjet and some new products could be registered in France even though Vidya’s products contain only natural traces of CBD. For any help, or to discover our cold-pressed hemp seed oil and products cultivated and made in France, please contact our sales team.

Is the future promising?

Considering the present regulatory situation, and how it is changing this seems complicated. The FDA concluded that CBD does not meet the definition of a food supplement, while in Europe, CBD has been classified as a novel food. THC always being classified as a narcotic. Even if the FDA has pledged to define the regulatory conditions of lawful sales of Cannabis sativa-derived products, the process will be long. The first step will be the definition of safe ingredients.

Considering that the interest, the curiosity and also the knowledge of consumers, or potential consumers, concerning CBD or hemp-derived products is still increasing, we should be optimistic. The sales of existing products are still increasing, and more and more new products are entering the market despite the regulatory situation. Effectively, pressure from consumers, and in some cases patients that have no choice but to improve their quality of life by taking CBD, could help CBD to be authorised for use in food supplements. We could then hope that cannabinoids, and more specifically CBD, will no longer be the symbol of the difficulties encountered by the nutraceutical, food & beverage, or even cosmetic, markets by introducing innovative plant-based renewable ingredients.

At Vidya we are confident in a positive future for CBD in food supplements. As a result, we continue to improve our knowledge and to implement our technical platform, using analytical tools and capacities to be able to positively respond to market expectations.

Conclusion

In an ideal world, hemp will become one of the best representative case studies on our modern ability to rapidly develop an eco-friendly, sustainable and circular profitable economy. But this is not an ideal world.

There is a consumer demand for CBD and hemp-derived products. Scientific studies, experiments and clinical trials are discovering and demonstrating the physiological properties and health benefits of CBD. Hemp cultivation could represent a new source of income for farmers. As a result of all of this, we may wonder if our scientific tools, the new ingredients and claims regulations, the safety procedures, are really adequate for consumer expectations, really adequate for the innovation requirements and the unstoppable globalisation of the market.

The coming years will provide the answers.

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LEVAGEN+ PEA: THE CBD ALTERNATIVE

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he demand for CBD and its potential therapeutic benefits has driven sales of the extract to an all-time high with market predictions of $57 billion by 2027. However, with this growth, comes confusion around cannabis, cannabinoid (CBD), and hemp. In the U.S. it reached a tipping point when the 2018 Farm Bill federally legalized the production of industrial hemp-derived CBD containing less than 0.3 percent of THC (tetrahydrocannabinol). Most states, though, have not been able to update their laws to match this new federal law, leaving them without answers to CBD’s legalities. Similar confusion is taking place in Europe. In January 2019, the European commission added extracts of cannabis sativa, including CBD, to the Novel Food catalogue, therefore requiring pre-market authorization. European Food Standards Agency (EFSA) has yet to approve any CBD supplier.

So, what is CBD and is it worth the potential risk? In the 1960’s, researchers established PEA to be an endogenous compound naturally present in all mammalian tissues (muscle, brain, heart etc).

How does it work?

PEA operates through multiple pathways and mechanisms within the body to provide its beneficial analgesic and anti-inflammatory effects. It has the ability to work both directly and indirectly within the ECS.

Directly, PEA reduces inflammation locally by inhibiting the secretion of pro-inflammatory molecules (e.g. histamine) via the PPAA receptors. Furthermore, on a cellular level, PEA stimulates a cascade of reactions that ultimately leads to regulating the expression of proteins that reduce inflammation.

Indirectly, PEA enhances the levels of other anti-inflammatory compounds that can regulate pain, such as AEA (often dubbed as the ‘bliss molecule’ or the body’s own ‘natural THC’). This is done by inhibiting the enzyme fatty acid amide hydrolase (FAAH), which breaks down AEA. This mechanism is known as the ‘entourage effect’. AEA’s ability to bind to both CB1 receptors and TRPV1 channels helps combat pain and increase relaxation.

Importance of PEA?

Levels of PEA naturally decrease with age. Moreover, when an individual encounters painful and/or inflammatory stimuli (e.g. exercise-induced inflammation from running), PEA levels drop precipitously as they start binding on to PPAA receptors. Exogenous supplementation is therefore needed in order to restore levels of PEA in the body.

PEA vs CBD?

PEA resembles CBD in that both substances have anti-inflammatory and neuroprotective properties. However, CBD is not produced by the human body unlike PEA, which is endogenously produced as a direct response and repair mechanism to inflammation and pain.

CBD also has yet to be proven effective and safe, as studies have only shown its benefits for certain diseases such as epilepsy. PEA on the other hand has a wealth of safety and efficacy studies in the areas of managing discomfort, supporting joint health and enhancing recovery.

More relevant in the realm of sport, PEA is an excellent supplement for professional athletes. Whilst THC levels in CBD supplements is highly regulated and will only be found in very small concentrations, both compounds occur naturally in the hemp plants, thus is not possible to remove THC completely. This provides issues for professional athletes who are regularly drug tested.

PEA can provide many of the same benefits as those anecdotaly claimed for CBD (i.e. pain, inflammation, sports recovery and sleep), yet removes the concern around THC, trace levels which are banned by the World Anti-Doping Agency in competing athletes.

The superior PEA - Levagen+

Due to PEA being lipid in nature, it does not dissolve well in water, reducing both the absorption and bioavailability in the digestive system. In order to overcome this issue, Gencor has developed a branded form of PEA, Levagen+. Levagen+ utilizes the novel, award-winning LipiSense delivery technology, created by Pharmako Biotechnologies, that helps increase bioavailability and functionality of PEA.

One study showed an approximately 1.8 increase in PEA blood levels when comparing 300mg of Levagen+ to 300mg of standard PEA formulation. This increase in absorption and bioavailability leads to a higher acute concentration of PEA and suggests that lower dosages will have the same efficacy when compared to standard PEA.

Moreover, with the ability of Levagen+ to disperse freely in water, formulators are able to develop various formats beyond capsules and tablets, which standard PEA is only limited to. These innovative formats include: RTD shots, effervescent, gels etc.

What can PEA help with?

Reducing acute and chronic soreness/inflammation: Through the mechanisms described previously, PEA has been shown to reduce acute and chronic soreness and decrease inflammation across a number of different ailments. A meta-analysis by Birker et al (2017) showed that PEA was associated with significantly greater pain reduction compared to control conditions.

Exercise performance & recovery: whilst currently there is limited data around the efficacy of PEA in exercise performance and recovery, the preliminary findings of a recent trial by Gencor demonstrated promising results. After supplementing with PEA, subjects had lower lactate levels than the control group signifying increased anaerobic energy metabolism, allowing for a higher level of intensity for a longer period of time. Participants also resulted in lower levels of myoglobin post exercise – a marker of muscle damage. Therefore, PEA could potentially lead to decreased muscle damage, increasing sports performance.

Sleep: PEA can help promote restful sleep through activation of CB1 receptors which increases a calming effect inducing sleep. By activating TRPV1 channels, PEA may also increase REM sleep – our deep phase of sleep.

Immune boosting: There is a wealth of evidence demonstrating PEA’s role lowering symptoms of cold, fever, headaches and sore throats, thus may be a potential immune-boosting ingredient.

General wellbeing: Endocannabinoids helps to regulate mood, emotion, pleasure perception and much more. PEA may also be able to reduce anxiety and stress through its ability to enhance the levels and actions of anandamide. Further, those with higher levels of PEA in their blood also showed to have a higher stress tolerance.

All in all, there is a tremendous amount of evidence demonstrating the benefits of PEA in various segments. Branded ingredients, such as Levagen+, presents ingredient manufacturers a solution to the demands of consumers and regulators for a safer, more efficacious CBD-alternative. Levagen+ is GRAS, approved by Health Canada as an NHP, and accepted as a dietary supplement in U.S., Europe, Australia and India.●
By: David Foreman RPh, Organic & Natural Health Association Advisory Council

All one needs to do is use their favorite search engine or the topic of “CBD” and immediately, the confusion begins. Throughout the past hundred-plus years, trade names have been found in hemp – synonymous with different categories of products. For example, KåneX has been used for facial tissue, and Xerox has been used for copy machines. Today, CBD is being used ‘generically’ for what could be CBD isolate, hemp oil, full-spectrum hemp oil, and Broad-Spectrum Hemp Oil. If you search medical websites such as PubMed to look for studies conducted in the arena of CBD/hemp/cannabis, you will get a broad range of studies using different names. Here is one of the questions we still need to answer: Which is best? Is it safe? Are there any drug interactions? What is the best dose to take?

The above questions are just the tip of the iceberg in this new and booming market. Before answering those questions, let’s start from the beginning. Hemp vs. Mari­juana. Keeping this simple, marijuana and hemp contain virtually the same number of phytochemicals and nutritional compounds but in different quantities. Of these compounds, the one that makes the difference is tetrahydrocannabinol (THC). THC is the psychochemical known to cause the “high” from marijuana use. Hemp plants are defined as any cannabis plant that has 0.3% or less of THC, and anything higher (THC >0.3%) is considered marijuana. Other than this commonality, both contain differing amounts of phytochemicals (cannabinoids, terpenes, for example), vitamins, minerals, fiber, protein, and essential fatty acids.

What’s the difference between CBD: Hemp Oil (HO), Full Spectrum HO, and Broad-Spectrum HO?

This question is one of the leading areas in which I believe manufacturers and market­ers deceive or fall short on behalf of con­sumers. Before digging into why this com­ment is made, let’s take a quick look at what the definitions are of the terms above.

CBD – CBD should only refer to the purified or concentrated phytochemical iso­lated from hemp/cBD (cannabis). It does not contain the other phytochemicals and nutrients found in hemp. Regrettably due to the confusion mentioned above, with regards to generically using CBD to mean all things hemp, the natural products indus­try and consumers use these three terms loosely. The FDA does not consider CBD a dietary supplement ingredient.

Hemp Oil – This term can mean just about anything. It is the oil extracted from one of the many parts of the hemp plant. Most of the current research on hemp oil re­volves around the oil, which originates from the seed. In the modern CBD-mar­ket, hemp oil is mostly derived from stalk, leaves, and flowers, all of which have different nutritional values. Hemp oil may or may not have the full array of nutrients and phytochemicals you are seeking. This is another area of huge confusion for the consumer and whether or not they will receive the benefits they seek.

Full-Spectrum Hemp Oil (FSHO) – FS­HO refers to hemp oil that contains the full array of nutrients and phytochemicals that are found in hemp, including 0.3% or less THC. In most cases, FSHO ingredients can be tested for bat­conservative levels. The hemp oil is com­mercialized by companies wanting to give consumers precise amounts of phyto­cannabinoids for serving.

Broad-Spectrum Hemp Oil (BSHO) – BSHO like that of FSHO also contains the phytoneutrients and phytochemicals, but it has been processed in such a way as to remove all THC. This is a good option for those concerned with drug tests for THC. Even with the minimal amount of THC found in FSHO, a person may test positive during a drug test. I believe that THC is part of the plant, which provides some of the health benefits which consumers seek this category and should be part of the mix.

Referring back to my comment about manufacturers and marketers deceiving con­sumers, just do an internet search for CBD, and you will find a plethora of prod­ucts that cross all of the versions of hemp mentioned above. These ingredients are not equal and should not be easily inter­changed or misconstrued as part of a market­ing plan. This is not the first time in the natural product industry in which this has happened. A great example is in the area of omega-3s from fish oil. Just because a product states it is fish oil, the EPA and DHA may differ in product A vs. prod­uct B even though the label on the front of the bottle states each capsule contains 1000 mg of fish oil. It may say 1000 mg of fish oil and contain zero omega-3s. The hemp arena is the same. Just because an ingredient is called hemp oil doesn’t mean it contains phytocannabinoids or in the same amounts. This is an area that needs either government regulation or better po­licing by the industry to avoid consumer harm or disappointment.

From discussions with industry colleagues, the hemp/CBD industry isn’t taking off as fast as initially thought. Perhaps in­vestigations of companies marketing a product containing hemp/CBD but only uses traces amounts or does not claim to be therapeutically effective. This is why we need better science substantiating what to take and how much. Until we have clinical suf­ficient evidence to list in this article.

The remainder of the research on dos­ing is not suggesting the accurate dose to be consumed. Until we have more independ­ent clinical studies, health benefit claims should be limited.

Are you confused yet?

Before continuing, the organization Or­ganic & Natural Health Association cur­rently has an active educational platform to help educate consumers on the safety and efficacy of “CBD” products. By sorting through the confusion, Organic & Natural Health is empowering consumers through education to make informed decisions about “CBD” and a plethora of other topics, such as vitamin D, omega-3s, and other di­etary ingredients. I am so excited about the efforts and currently sit as part of their scientific advisory council. As a pharmacist and natural health expert, the category of hemp/CBD/cannabis has been a challenging one to wrap my head around. Making things simple, there are several key areas we need to focus on in the B-to-B world:

1. Clear Labelling. What is being sold, dosing, etc. It is FS­HO, BSHO, just CBD?
2. Education. Both industry and con­sumers need better science substantiating what to take and how much. Until we have clinical Data and Relevant animal studies. Cannabis and Cannabinoid Research, 2017. 2(1): p. 139-154.
3. Iffland, K. and F. Grotenhermen, An Update on “cBD” and a plethora of other topics. Regrettably due to the confusion mentioned above, with regards to generically using CBD to mean all things hemp, the natural products indus­try and consumers use these three terms loosely. The FDA does not consider CBD a dietary supplement ingredient.
9. Crippa JA, de Freitas DS, Campos AC, et al. brewery and plant interior to wrap our heads around. Making things simple, there are several key areas we need to focus on in the B-to-B world:

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Biography

David Foreman RPh, is a pharmacist, author and media personality known to consumers nationwide as, “The Herbal Pharmacist.” Well­versed on the healing powers of the hemp/cBD/cannabinoid plant in mainstream medicine and he has dedicated his entire career to educating consumers about the benefits and power behind natural herbs, supplements and functional foods. Foreman is a graduate of the University of South Carolina College of Pharmacy, currently serves on Organic & Natural Health Association’s Scientific Advisory Council and is author of, “4 Pillars of Health: Heart Disease.” Twitter: @Herbalrph Facebook: facebook.com/TheHerbalPharmacist
Stevia Innovation Accelerates: From Losing Bitterness to Modulating Flavour

Stevia innovation accelerates: the industry has responded to this there has been a notable shift in demand a particular spike in the last two years. Over the last few years, with consumer preference – we have seen a third of consumers looking to avoid food and drink that contains artificial ingredients, there has been a notable shift in demand towards ingredients from plant sources, such as stevia sweeteners.

The industry has responded to this consumer preference – we have seen the number of food and beverage formulations containing stevia increase exponentially over the last few years, with a particular spike in the last two years. Stevia sweeteners have now overtaken aspartame as Europe’s third most popular sweetener and accounts for more than a quarter of all sweetener usage in Europe, behind only sucralose and Acesulfame K.

It continues to grow at a faster pace than any other sweetener in Europe, gaining traction across a wide range of categories, including beverages, confectionery, dairy and convenience.

From early formulation challenges to combinatorial applications: While we know that many consumers are attracted to plant-based sweetening solutions, they’re not willing to sacrifice great taste, which is still the dominant factor impacting buying behaviour. Stevia sweeteners have therefore been on a journey to achieve the best taste profile possible, and the scientific applications used have evolved enormously over the last few years. Those applications involve controlling the steviol glycosides compositions, which are the active compounds in the Stevia leaf that deliver sweetness, of which the most commonly used is Rebaudioside A (Reb A).

One of the biggest challenges ingredients manufacturers have faced in the last few years has been around removing the bitter aftertaste commonly associated to early-generation stevia products. Standard stevia products with lower Rebaudioside A content were known to exhibit a detectable bitterness or lingering aftertaste, which was enhanced by the content of other compounds such as Steviolose, the second most common steviol glycoside in the leaf. When the Reb A content was increased to improve the purity and therefore the taste, cost typically went up and solubility could then also become an issue. To combat this, first-generation stevia products often had to be formulated with other sweeteners or masking agents, in order to mask bitter aftertastes for consumers and manage solubility issues for manufacturers.

Scientific advances are now increasingly focused on the usage of rarer steviol glycosides, including Rebaudioside M, C, B and D, which all have different properties and individual taste profiles. As part of this, scientists have explored the bitterness concentration thresholds for individual molecules and developed combinatorial formulations to achieve an improved taste compared to first generation technology.

The combining of steviol glycosides allows a countless number of different molecular combinations. Different blends can be tailored to suit specific formulation requirements across a variety of food and drink categories. For example, sweetener solutions are particularly crucial for use in beverages, whereas a rich, dairy formulation profile will become more closely aligned to a cooked strawberry.

In order to meet the increased demands for innovative low and no calorie sweetening solutions, in 2017 Tate & Lyle entered a partnership with Tate & Lyle, a global leader in sweetener solutions. Through the partnership, customers have access to this exceptional line of stevia solutions, including the OPTIMIZER Stevia™ range, which provides great taste with lower cost-in-use, as well as other established stevia offerings, such as the breakthrough proprietary stevia extract INTESS™ range.

The range also includes the newly launched ZOLESSE™ NATURAL FLAVOUR, which is designed to be used as a flavour masking ingredient. ZOLESSE™ is labelled as a natural flavour and has been developed to deliver a clean taste profile in carbonated soft drinks and flavoured waters, building on Steviol Glicidoses taste modulation properties. With the breadth of its portfolio, Tate & Lyle is now delivering even more solutions for manufacturers to help them tackle their unique formulation challenges and create products that their end consumers are looking for.

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3. Mintel, Global New Products Database (GNPD)
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5. Rapport Reports Worldwide
How do consumers feel about CBD products?

The following are based on our Q3 Global and Regional CBD Survey - 26,000 respondents.

Brands and manufacturers are creating products that contain cannabis oil. In its simplest form, these products contain concentrated legal forms of cannabis extracts that are said to offer physical and mental health benefits.

39% of global consumers have heard of the term CBD, and 36% have not heard of CBD.

22% of global consumers who have heard of CBD currently use these products.

43% of consumers who use CBD products currently use it to help relieve anxiety. With 54% saying they have been effective.

Of consumers who said they would not be willing to try CBD is because 4 in 10 people do not feel they have enough information.

Of brands provided more information consumers would be more willing to try CBD products.

How appealing do products sound that contain CBD oil that help address the following health claims?

<table>
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<th>Very Unappealing</th>
<th>Somewhat Unappealing</th>
<th>Not Sure</th>
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<td>10%</td>
<td>18%</td>
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</tbody>
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IFT20 is the place, the platform, and the event to help you re-imagine, learn, connect, and shift to what’s possible in the future of food.

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Opportunity & Responsibility
Science will continue to help shape the products most sought after in the omega-3 market in years to come, but sustainability is equally important to this discussion. The global demand for environmentally friendly products has helped steer the supplements market into a more positive direction.

One of the biggest and most significant recent developments for Aker BioMarine was a large-scale Antarctic survey conducted to enhance the health of the krill biomass. Several governments came together to prepare a systematic measurement of how much krill there is around the Antarctic Peninsula and four other areas of krill today than what was recorded in the last large-scale krill survey conducted in 2000. These findings proved that the krill stock is in a healthy condition and remains one of the best managed and underutilized marine resources in the world.

In addition to the krill biomass survey, a recent collaboration with Greenpeace to create Marine Protected Areas was very important to this discussion. After many years of dialogue with several of the leading environmental NGOs, the various groups set out to explore how everyone could work together to support the process of listing a network of Marine Protected Areas.

Minimizing the need for fishing vessels to spend time and resources looking for krill, the use of the ocean data drone significantly reduces the financial and environmental costs. All the data collection carried out by the drone has a carbon footprint of zero.

There is no question that the Salibuoy is changing the way the company works. By positioning it close to the vessel, it will help do the necessary searching. It can also cover remote areas for up to months at a time, telling the crew where and when to proceed. The data is invaluable, enabling Aker BioMarine’s crew to help make operations even more sustainable and focused, lowering impact to the environment.

In addition to the operational advantages for Aker BioMarine, the data collected from the Salibuoy will provide benefits to the wider scientific community and the krill fishery as a whole. The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the international treaty managing the krill fishery in the Southern Ocean, has received the data collected by the Salibuoy as part of its operations in Antarctica. The commission can now use the data collected by the Salibuoy to take a bigger step in a new data-driven era of sustainable fishery management.

The two-meter-long ocean data drone (Salibuoy) is equipped with echosounder and environmental sensors to collect process and transmit density and distribution data from wherever it is deployed in real time. Easy to operate, launch and recover, the unique ocean drone uses wind for propulsion and is powered by solar panels, which charge the internal batteries. Built to be robust and to survive the tough Antarctic conditions, it was also designed to be small and unobtrusive to avoid disturbing the local wildlife.

Choline, an essential, yet underfed nutrient is important for proper cell structure, function, and signaling, as well as cardiovascular, liver and cognitive health. The body produces a small amount of choline, but we need to get the rest from our diets. Choline intake is actually below what is considered adequate in significant parts of the US and EU populations, as well as Japan.

The science team at Aker BioMarine recently performed a randomized, placebo-controlled, two-way cross-over pharmacokinetic study with 18 healthy subjects. 12 subjects received 2 study products: choline bitartrate capsules (providing 620 mg choline) and 8g of Superba BoostTM (providing 572 mg choline). While 6 subjects received the placebo control product (fish oil). When compared to choline bitartrate, the nutrient uptake is at least as efficient from Superba Boost krill oil as from choline bitartrate, a dietary supplement tailored to optimize absorption of choline, but those taking Superba Boost had a much lower plasma concentration of choline, but those taking Superba Boost had a much lower plasma concentration of choline.

According to the 2019 report that analyzes reduction fishery stocks worldwide, three percent of the total catch volume comes from stocks classified as ‘very good condition’. As in the four previous editions of this report, this corresponds to a single fishery: Antarctic Southern Ocean Krill. To that end, for the fifth year in a row, Aker BioMarine received an ‘A’ rating from the SFP. The important work of the SFP leaves no doubt that we need a new kind of leadership at sea. We know that we need to protect more oceans more, but we need to do so in a sustainable way.

Big Data is the Future of Sustainable Fisheries Management
Technology and big data are driving forces in the future of sustainable fisheries management, as well as for major focus areas for Aker BioMarine. By aligning technology and big data to its sustainability efforts, Aker BioMarine is aiming to reduce its industrial footprint while strengthening its positive handprint.

Aker BioMarine is excited to announce a new project that will positively impact data collection in terms of the krill biomass. Aker BioMarine is launching an unmanned solar-powered ocean data drone (Salibuoy), as part of its operations in Antarctica, with the unique capability to take a bigger step in a new data-driven era of sustainable fishery management.

The new two-meter-long ocean data drone (Salibuoy) is equipped with echosounder and environmental sensors to collect, process and transmit density and distribution data from wherever it is deployed, in real time. Easy to operate, launch and recover, the unique ocean drone uses wind for propulsion and is powered by solar panels, which charge the internal batteries. Built to be robust and to survive the tough Antarctic conditions, it was also designed to be small and unobtrusive to avoid disturbing the local wildlife.

Boosting Your Choline Levels with Krill Oil
Did you know that you can boost your choline levels with krill oil?
Omega-3 Delivery
PUFAs are available in several chemical forms, including natural triglycerides, free fatty acids, ethyl esters and re-esterified triglycerides. To minimize the volume of PUFAs required per dose, EPA and DHA are available in concentrated form in either the free fatty acid (FFA) form, or as an ethyl ester (EE). In terms of oral bioavailability, plasma levels of EPA and DHA are usually reported as higher for triglycerides and FFA compared to the EE form; however, consumption of all forms has been shown to significantly increase plasma levels of EPA and DHA.3,4

Oral bioavailability of omega-3s is limited due to low water solubility, thus requiring high doses to achieve the required plasma concentration of EPA and DHA. Studies have demonstrated optimal Omega-3 absorption with a high fat meal as a result of the digestion process stimulating the release of bile salts and digestive enzymes.5 This digestion process promotes emulsification of the fats leading to increased solubilisation, access to digesting enzymes and improved absorption.6 However, for those patients with hypertriglyceridemia, the National Cholesterol Education Program (NCEP) recommends consuming meals with a very low-fat content (<15% fat content).7 Thus, on a low fat diet, absorption of the EE form is less complete, requiring higher doses to reliably achieve the recommended daily consumption.

Application of intelligent formulation design has the ability to address the poor bioavailability and improve the fasted state bioavailability of fish oils. Particle based techniques including emulsification, self-emulsifying drug delivery systems (SEDDS), solid-state formulation via adsorption of fish oil onto a solid support,8 or microencapsulation in a silica-oligomer hybrid (SLH) particle have demonstrated improved oral bioavailability of poorly soluble compounds.9

Emulsification of lipid systems represents an important strategy to improve bioavailability,10,11 and has demonstrated improved oral absorption of Omega-3 lipids.12

Through addition of natural emulsifying ingredients, self-emulsifying delivery systems (SEDS) spontaneously emulsify upon ingestion and aid in absorption. SEDS have previously demonstrated improved uptake of Omega-3 EE’s during fasting or with a semi-saturated fat meal due to the system’s ability to mimic the conditions of the fed-state (a phenomenon where the bioavailability of active compounds is increased when administered with a fatty meal).13,14 and have demonstrated a mitigated food effect for Omega-3 EE’s.15

Optimising Omega-3 uptake
AquaCell® is a SEDS formulation developed by Pharmako Biotechnologies containing lipid and emulsifiers. The AquaCell fish oil formulation emulsified rapidly when added to water, producing small oil drops, while the control oil without surfactants or emulsifiers do not emulsify.

This study was designed to investigate the benefits of AquaCell SEDS on the absorption of Omega-3 EE after a single dose. When formulated with the Omega-3 fish oil, the self-micro-emulsifying delivery system from Pharmako enhances bioavailability of the EPA and DHA in healthy subjects under low-fat diet conditions. Participants were randomised into two groups, receiving either the SEDS AquaCell fish oil formulation or the unformulated fish oil EE. The novel delivery system demonstrated a significant 7-fold improvement in the oral absorption of Omega-3 fatty acids without requiring a high-fat meal.16 The AquaCell® formulation was able to emulsify the Omega-3 EE upon ingestion which provided an increased surface area for improved digestion and elevated EPA and DHA absorption, as shown in Fig. 1.

This SEDS formulation provides an effective method to deliver EE forms of Omega-3 fish oil compared to currently available formulations and provides an approach to achieving higher bioavailability required for achieving the elevated tissue EPA/DHA levels for cardiovascular benefit. And as a bonus the researchers also found that trial participants using AquaCell Omega-3 EE capsules reported no fish aftertaste and burps.

A wealth of studies support supplementation with Omega-3 for cardiovascular health. Thus, formulations that are highly bioavailable like AquaCell Omega-3, presents an attractive option for those considering increasing their Omega-3 levels.

References

Omega-3’s are long-chain polyunsaturated fatty acids (PUFAs) that provide many health benefits in cardiovascular, brain, eye, skin and joint health. The two main components of Omega-3 are eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Only limited amounts are produced in the body, so these compounds must be obtained from our diet. Dietary sources high in Omega-3’s include fish, shellfish, walnuts, flax and tuna. Dietary supplements are an alternative option which typically contain fish oil, krill oil, cod liver oil, or a vegetarian option of oil obtained from algae.

Omega-3 benefits
There has been considerable interest in potential health benefits from Omega-3’s for many decades, with studies providing evidence that consumption of Omega-3’s has the potential to lower triglyceride levels for reducing the risk of cardiovascular disease, anti-inflammatory1 factors in areas such as arthritis, and also in the treatment of depression.2 One commercial formulation has been approved by the FDA for treatment of severe hypertriglyceridemia.

Cardiovascular health
Cardiovascular health has been the topic of many large clinical trials. Many population studies have demonstrated reduced cardiovascular disease with consumption of Omega-3.3 It has been shown that Omega-3 can provide a protective influence via altering cell membrane function, and impacting on inflammatory, oxidative and thrombotic pathways active in athero-sclerosis.4 While there have been mixed results as to the benefits of Omega-3’s for various cardiovascular outcomes, more recent trials have demonstrated potential benefit from higher doses, with potential to elevate tissue levels of EPA and DHA in populations with hypertriglyceridemia5.
Nena Dockery, Scientific and Regulatory Manager, Stratum Nutrition

Omega Fatty Acid Supplementation

Fat-soluble vitamins, particularly those containing omega-3 fatty acids, have become one of the top ingredient categories within the dietary supplement industry. Both omega-3 and omega-6 FAs are structural components of cell membranes; they are sources of energy and are precursors to lipid mediators that play vital roles in immune and inflammatory responses; and the typical Western diet doesn’t provide the best balance of these nutrients on its own. But the way these important fats work in the body involves complex metabolic pathways that should be at least minimally understood in order to know and understand the best way to supplement with them.

There are only two truly essential FAs, meaning that our bodies cannot make them. Our diet needs to include the omega-3 fatty acid metabolism. Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), the end products of omega-3 fatty acid metabolism. EPA is recognized mostly for its anti-inflammatory attributes and benefits in reducing the risk of chronic diseases linked to inflammation, such as heart disease. DHA is integral to brain development and function as well as eye health. EPA and DHA are only found naturally in marine sources, including oily fish, krill and algae. The dietary sources (oily fish like salmon, mackerel and sardines) are also less likely to be a regular part of the Western diet, contributing to the potential for deficiency.

Under optimal conditions, consuming a diet that contains balanced amounts of foods containing both ALA and LA would result in enough of the end-products of their metabolism for our bodies to function as they should and maintain health. But, unfortunately, it is not that simple. The metabolic pathways of ALA and LA share several enzymes needed for the various intermediate reactions and are also influenced by the relative levels of longer chain fatty acids produced by the reactions occurring in the other pathway. For instance, the production of the pro-inflammatory fatty acid, arachidonic acid, is not a “one size fits all” but instead can, and should be tailored to an individual’s own diet and lifestyle. Probably most, if not all of us need to consider some type of omega fatty acid supplementation because of the extensive role they play in maintaining overall health, beginning in every cell in our bodies. And now, more than ever, it is possible to select the right supplement to fit our individual needs and preferences.

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Flaxseed, hemp and chia seed oils have gained in popularity because they are vegetarian sources of omega-3 ALA. They are marketed to offset the high levels of LA consumed by so many through diet. These fats can be beneficial to many, but only those who are not deficient in DHA or its cofactors. In addition, GLA supplements have experienced an increase in popularity in products marketed for general inflammation support, women’s needs related to hormonal fluctuations and for conditions that affect the skin.

For those who are not deficient in EPA or DHA, supplementation alone may not be best and could be detrimental in high doses. For persons who are deficient in the key enzyme (D6D) or one of the cofactors needed to begin the first reaction in the metabolic pathway of both ALA and LA, a different approach to supplementation may be preferable. In addition, some recognize a need for fatty acid supplementation, but do not wish to consume fish or take marine sourced supplements. As a result, additional options in fatty acid supplementation have arisen to meet these needs.

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For some individuals who have low serum levels of EPA and DHA, due to inefficient conversion from ALA and/or no dietary intake through food sources, supplementation with these two omega-3s might be beneficial, and high-quality fish, krill or algal oil supplements with a ratio of EPA to DHA of around 2:1 are generally recommended. Also, pregnant women may want to consider DHA supplementation to help support neurological development.

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Omega 3 is a fatty acid with a long-term appeal, both as a supplement and an ingredient. Long associated with fish and some meats, it has been increasingly used to fortify other products, and has a high appeal. With consumers increasingly demanding more from their products, and with a higher level of interest in nutritional contents and compositions than ever before, omega 3 is increasingly popular as an ingredient, both in traditional and non-traditional products. Understanding consumer opinions on this subject is important, and knowing what they look for in a product — and what they are looking to avoid — is vital.

FMCG Gurus research from the Omega and Fatty Acids Survey (2019 – 26,000 respondents) shows a clear awareness of omega 3 among global consumers, with 83% responding that they were ‘aware’ or ‘very aware’ of it as an ingredient, and only 4% suggesting that they were totally unaware. Similarly, consumers also have a high opinion of the health benefits of omega 3 among global consumers, with 75% suggesting that it would have a positive influence. Again, only 4% said it would have an actual negative effect. For companies looking to include it as an ingredient in products, this is a fantastic sign: often, consumer awareness is a difficult hurdle to clear, but here the work has already been done, giving a comfortable head start.

Consumers are also already motivated to search out products containing omega 3. 70% of respondents said that they looked for omega 3 content some, most, or all of the time. Another 14% said that they would look rarely, and only 16% indicate that they are totally uninterested in it, indicating again that there is already a high level of awareness and appeal with this ingredient. Most – 62% – of these consumers look primarily for this claim in fish, with 61% also looking in meat, but numbers in other areas — ones that could be seen as less traditional — are much lower. Only 36% of consumers look for omega 3 in dairy products, and chocolate is lower still at 22%. Any new products in this range fortified with omega 3 would have to be clear and explicit about this addition to ensure that consumers make the proper connection with the brand.

Although consumers are definitely convinced of the benefits of omega 3 as a supplement and ingredient, there are still definite concerns about unintended side effects when used. 75% of respondents said that it was important or very important that food that contained omega 3 do not smell like fish, and 61% of those who looked for omega 3 claims said that they wanted to see tastier products that contained the ingredient. It should be realized that, however much consumers may be drawn to an ingredient due to its other benefits, there will always be a strong impulse to prioritize taste and texture. Pricing is another concern, with another 61% saying that they would like to see more cost-effective products available. Of those who say they do not seek out products containing omega 3, 39% say that it is because available products are not tasty enough, and 46% say that it is because the available options are too expensive. Clearly there is a delicate line to walk here, with the ideal product being healthy, flavorful, and reasonably priced.

Understanding what consumers want and what they are looking to avoid is paramount for a brand. Whether launching a new product, tweaking an existing one, or just looking to get the most out of an existing range, this sort of insight is invaluable. Omega 3 is an ingredient with a broad appeal, and the potential to increase this into new markets: with the right positioning, great things are possible.

Andrew Crofts, Senior Research Analyst at FMCG Gurus

This article is based on our Global and Regional Omega and Fatty Acids Survey 2019

For more info please contact FMCG Gurus at info@fmcggurus.com

Understanding consumer preferences towards omega 3
Identifying infants vulnerable to the adverse effects of iron supplements

Iron supplements are often given to infants in low-income countries to counteract anaemia. However, high doses of dietary iron can negatively impact the infant gut microbiome. In addition, it has been suggested that iron supplements modify the response to oral antibiotics, particularly reducing their efficacy against enteropathogens. Some of these problems can be addressed by combining iron supplements with prebiotics in the form of galacto-oligosaccharides (GOS). Research recently published in the journal Nutrients now suggests that specific oligosaccharides found in human milk can act as a ‘natural prebiotic’. The presence or absence of some of these human milk oligosaccharides (HMOs) seems to affect how the infant gut microbiota responds to dietary iron. Identifying the profile of complex sugars in the mothers’ breast milk may help to determine which infants are likely to be more vulnerable to the adverse effects of iron.

Differing responses to iron supplements

The team of researchers was led by Daniela Paganini and prof. dr. Michael Z{"u}nser, Department of Physiology and Zurich University of Zurich in Switzerland, and the Netherlands.

The researchers therefore set out to determine the effect of giving iron together with specific HMOs. The results suggest that the HMO profile may modulate the way in which the infant gut microbiome responds to supplementary iron. In addition, compared with infants of secretor mothers, infants of non-secretor mothers appear to be more vulnerable to the adverse effect of iron. But this extra vulnerability also means that they likely derive greater benefit from the provision of prebiotics in the form of GOS. Identifying such vulnerable infants is a new step towards a more specific approach of safely preventing anaemia. A possible direction of future research, therefore, is to determine the effect of specific HMOs (those that are missing from the milk of non-secretor mothers) on the infant gut microbiota during the provision of supplementary iron. More research is needed on whether these specific HMOs may be more effective than GOS when it comes to modulating the immune system and the gut microbiome, thereby helping to prevent pathogen binding and infections. The most common HMOs are the neutral fucosylated and non-fucosylated oligosaccharides. But not all breast milk contains specific fucosylated oligosaccharides. This is due to a homozygous mutation in the FUT2 gene, which encodes the α-1-2-fucosyltransferase enzyme. Women with such a mutation are non-secretors as they cannot produce certain HMOs. The difference in milk composition between secretors and non-secretors is thought to affect the infant’s health. Approximately 20% of women worldwide are thought to be non-secretors, but this proportion is known to vary from country to country.

Investigating the impact of maternal HMO profiles in Kenya

Despite increasing knowledge on HMOs, data on the breast milk composition of women in Sub-Saharan Africa is limited. Until now, it was also unclear whether variations in HMO composition might have an effect on the way in which infants respond to iron supplements and/or prebiotics in the form of GOS.

The researchers then looked at the three intervention groups separately and saw three key differences between infants of secretor and non-secretor mothers. Firstly, in the ‘no iron or GOS’ control group, the infants of non-secretor mothers were more likely to get diarrhoea. Secondarily, in the ‘iron only’ group, the infants of non-secretor mothers had a greater decrease over the 4-month period in the relative abundance of protective bacteria. Thirdly, in the ‘iron and GOS’ group, infants of non-secretor mothers benefited most from the co-provision of GOS: these infants maintained protective bacteria, and had a significant increase in body iron stores over the 4-month period, while no such increase was seen in the infants of secretor mothers.

Future studies needed to determine the effect of giving iron together with specific HMOs.

In light of the ongoing COVID-19 health situation, we have taken the difficult decision to postpone Vitafoods Europe 2020 until 1-3 September 2020.

This conclusion is not one that has been reached easily. However, following consultation with our stakeholders, and taking the continually evolving health concerns and travel restrictions into consideration, we are agreed the postponement is the best course of action.

By acting now, we hope to remove the uncertainty affecting exhibitors and visitors and allow them to make more concrete business decisions.

The event in September will still take place at Palexpo, Geneva, Switzerland, and all existing registrations and commitments remain in place.

We understand how important Vitafoods Europe is to the industry and how much effort goes into preparing for it and so, in this unprecedented situation and difficult time, thank our community for its understanding and support. We’re looking forward to coming together later in the year to continue to drive our industry forwards.

Chris Lee, Managing Director, Health and Nutrition Network at Informa Markets
Body and mind are one. For athletes, nootropics may help overcome the mental barriers that prevent them from realising their full potential. Focus is what gets an athlete through the difficult last few sets of a workout or the final minutes of a long game. Additionally, sportspeople know that mental acuity helps them avoid injuries. Supplementing the diet with a natural nootropic like astaxanthin can help to support mental clarity and focus, and fight fatigue—as has been shown in a double-blind, placebo-controlled study. In the first study of its kind, participants were given 12 mg of AstaReal® natural astaxanthin or a placebo for 8 weeks.

The study was designed to induce the fatigue and stress that daily life and athletic training impart. To challenge their mental capacity, the participants were subjected to a number of timed calculations that required intense concentration. The physical component was performed using a bicycle ergometer. At the end of the study period, Visual Analogue Scale analysis showed that astaxanthin significantly reduced the perceived symptoms of mental and physical fatigue compared with the placebo. Results included improvements in clarity of thinking, concentration, motivation and mood. With regard to the mental calculations, an increase in errors observed in the placebo group during the second half of the test was almost eliminated in the astaxanthin group.

Against this backdrop, it stands to reason that e-sports could also benefit from astaxanthin. Computer strategy games are extremely complex because in addition to the motor skills required, they demand a high degree of tactical understanding. Indeed, scientists at the German Sports University have found that e-sports athletes are exposed to physical strains similar to those of “normal” athletes. The amount of cortisol produced by the body of a gamer is about the same as that of a race-car driver. This is combined with a high pulse rate—sometimes as high as 160 to 180 beats per minute, the level reached during a very fast run. It can therefore be seen that e-sports are just as demanding as most other types of sports. Thus, an e-sports athlete’s diet should be similar to that of other competitive athletes, and include additional nutrients such as astaxanthin, which modulates blood pressure and works as an anti-inflammatory.

Too much blue light
The growing popularity of e-sports also illustrates another of modern society’s major issues. Use of multiple digital devices means that we are exposing our eyes to more blue light than ever before. Research indicates that this overexposure may be disrupting our sleep cycles and consequently contributing to fatigue, hypertension and insulin resistance. Too much light in the 380-500 nm range has been implicated in depressed visual acuity—known as computer vision syndrome—possibly linked to oxidative stress. In the eyes, light reacts with oxygen, generating free radicals (ROS) that are harmful to the local cells and the optic nerve. A pan-European survey carried out by YouGov in 2016 found that eight out of ten European millennials experience digital device related eye fatigue, with the average worker spending more than 45 hours in front of a computer screen every week.

As blue light reduces contrast, it contributes to eye fatigue. This makes it more difficult for the ciliary muscles to focus the eye. With time, the eye lens becomes increasingly rigid, making it even harder for the ciliary muscles to adjust our vision for near focus. However, astaxanthin accumulates in the front and the back of the eye, providing all-round protection: it neutralises ROS, reduces inflammation and improves capillary blood flow—not only in the eyes, but also in the brain.

Keeping the brain in tune
As a nootropic supplement, astaxanthin is known to confer protection on mitochondria and confer protection to brain cells. The brain is particularly vulnerable to oxidative damage. The brain is quickly surprising that ROS play a role in many neurological diseases. A healthy human body’s antioxidant defence system keeps the generation of ROS under control. However, these defences get weaker under oxidative stress. In the eyes, light reacts with oxygen, generating free radicals (ROS) that are harmful to the local cells and the optic nerve. A pan-European survey carried out by YouGov in 2016 found that eight out of ten European millennials experience digital device related eye fatigue, with the average worker spending more than 45 hours in front of a computer screen every week.

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“Probiotics are more important than multivitamins and should be taken daily.”

DD Innovations

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