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Thinking Outside the Hive: Bees, Functional Foods, and Malnutrition

Elizabeth Harris, MS, RDN

Bees, functional foods, and malnutrition are interdisciplinary fields that have gained increasing recognition in recent years. Bees, for instance, are now being recognized as superfoods with numerous health benefits. Honey, pollen, propolis, and royal jelly—products of bees—are being studied for their potential health benefits. This article explores the role of bees in functional foods and their implications for human nutrition.

Honey
Honey is perhaps the most widely recognized bee product and one that classifies as a functional food. While its chemical composition varies widely depending upon its botanical origin and bee species, honey contains up to 27 amino acids, various enzymes, trace minerals such as iron, chromium, manganese, and selenium, vitamin K, carotenoids, and ascorbic acid. Flavonoids and other phenolic compounds known to have antioxidant properties are also found in honey.

Additionally, honey has been shown to have both prebiotic and probiotic effects, stimulating the growth of beneficial Lactobacillus and/or Bifidobacteria. It has been widely demonstrated that honey has antimicrobial, anti-inflammatory, antiviral, anti-fungal, antibacterial, wound-healing, cardioprotective, and many other protective properties. Of note, a review in the Journal of Medicinal Food found that honey samples from 22 countries inhibited the growth of a wide range of bacteria, including Escherichia coli, Helicobacter pylori, oral streptococci, Staphylococcus aureus, methicillin-resistant S. aureus, salmonellae, and many others. Finally, honey is known to contain acetylcholine, a neurotransmitter, and choline, a nutrient necessary for cardiovascular health and brain function.

In addition to its functional properties, research regarding the effects of honey on everything from gastrointestinal diseases to diabetes, specific cancers, cardiovascular disease, athletic performance, eye diseases, and other disorders is mounting. Large, high-quality studies with clear results are scarce; however, there are certain conditions in which the available evidence favors its efficacy.

For example, honey has been found to promote wound healing due to its high sugar content and hygroscopic properties (which inhibit bacterial growth by drawing water away from bacteria). Its low pH, ability to generate hydrogen peroxide, and protease compounds also contribute to its antimicrobial, wound-healing functions. Honey has been shown to boost immune activity, promote wound debridement, and stimulate wound regeneration. A recent literature review of 20 studies (13 primary and 7 systematic reviews) by Vyhlídalová et al found that all but three reported significant improvements in the treatment of lower leg or diabetic ulcers or other malignant wounds using honey dressings, noting such improvements as shortened healing time, a higher percentage of completely healed wounds, and reduced infections. Although the caliper of available studies varies, the FDA approved the use

Continued on Page 4
Welcome to the 2019-20 Academy year and to all of the members offering their time in leadership positions. Still attempting to catch the newsletter up with the actual season in which it is released. The last day of August is the unwritten/psychological end to Summer, so we’re close. Most times we pull together articles that represent a theme; other times, we assemble what we can. Loose connections are in this issue with articles featuring bees & bee products, histamine, food sensitivities, IBS, and the Longevity Diet.

Not sure why “food as medicine” provokes controversies and lots of semantic banter. Food is love, joy, connection, culture, life-giving…and it can also be medicine. Whether we are using honey for bacterial infections or sharing an ice cream with friends, food can be medicine for the body and soul.

Evidence and acceptance continue to increase for the role of the mind in disease and health. Even with all of its gifts and virtues, science has limitations because as humans, we have limitations; and certainly when it comes to the mind, we don’t know everything just yet. It’s difficult to quantify the emotion or pain someone feels and know what impact it has on and within the body. Further, although we may not have appropriate tools or an arbitrary number of studies to prove something, does not mean it’s untrue. Lastly and importantly, all hail the scientific method, but it is not a cloak to stand behind with a dagger to keep questioners at bay, but a way to measure and organize what we suspect to be true. Check out the way one practitioner uses mind-body-energy practices to increase her clients’ health.

As a precursor to our “Hot Topics in Integrative & Functional Nutrition” symposium taking place the Saturday before FNCE®, check out the review of The Longevity Diet. We appreciate you taking the time to read, and as always, we welcome any ideas and topics that you’d like to see addressed! Find me on Instagram @jenagrd or email me anytime at jenas_mailbox@yahoo.com.

Jena Savadsky Griffith, RDN, IHC
jenas_mailbox@yahoo.com

Holly A Van Poots, RDN, CSP, FAND
hollypnpg@gmail.com

Staci Belcher, MS, RDN
stacibelcher5@gmail.com

Olivia M Dong, MPH, RD, LDN
odong@email.unc.edu
Janie Jacoby, MS
Janie.Jacoby@colostate.edu

Julia Shuff, RDN, LD
jwhelan928@gmail.com
Geanna Revell, MS, RDN
geanna.revell@gmail.com

Dina Ranade, RDN, LD
dranade@comcast.net

Chrissy Barth, MS, RDN, RYT
chrissy@nutritionlifestyleeducation.com

Linda Lockett Brown, ABD, MA, RDN, LDN, CLC
Christian Calagayas, RD

The views expressed in this newsletter are those of the authors and do not necessarily reflect the policies and/or official positions of the Academy of Nutrition & Dietetics.

We invite you to submit articles, news, and comments. Contact us for author guidelines.

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Chair’s Corner

When I first joined DIFM’s leadership team in 2013, I knew I had found my tribe—but never did I imagine that I would one day be serving the tribe as Chief. I’m so excited, honored, and humbled to take the wheel and continue to drive forward the work that my amazing predecessors have begun. We have so much to be proud of—in its 21 years, DIFM continues to grow and break down barriers. We continue to be the third largest DPG, and while I dream big for the future of our group, I know we can make the number one spot a reality.

As each Chair-Elect prepares for the transition into their Chair term beginning on June 1, members of the leadership team meet in the Spring to prepare for the upcoming year. Inspired by the path already trailblazed by DIFM, I chose the theme for my spring meeting to be “Empower, Enlighten, and Energize.”

According to the Cambridge English Dictionary:

Empower: verb
♥ to encourage and support the ability to do something
♥ empower is also to give legal authority for something

Enlighten: verb
♥ to cause someone to understand something by explaining it or by bringing new information or facts to that person’s attention

Energize: verb
♥ to make something active
♥ to make someone feel energetic or eager

When I reflect on what DIFM not only means to me, but the impact this practice area has, I think these words can resonate with many of us.

Some recent examples of our theme:

Just recently in the June 2019 issue of the Journal of the Academy of Nutrition and Dietetics, we have the publication of the Revised 2019 Standards of Practice and Standards of Professional Performance for Registered Dietitian Nutritionists (Competent, Proficient, and Expert) in Nutrition in Integrative and Functional Medicine—empowering us all to share the recognized scope that we possess and the evidence-based tools and resources we employ in our practices. The revised SOP/SOPP also includes the updated radial—a useful teaching tool to help illustrate what sets an integrative and functional nutrition expert apart. I challenge each of you to share the SOP/SOPP with your networks—have a launch party to raise awareness of this resource and thus you will in turn be enlightening and energizing others about our practice area.

Also, in June, the Center for Lifelong Learning (CLL) released the long-awaited Integrative and Functional Nutrition Module 3: Environmental Toxins, Exposure, and Elimination, for the certificate of training program (COTP) in Integrative and Functional Nutrition. It is currently the best-selling COTP of all. Personally, I want to thank everyone involved for their patience and dedication to bringing this module full circle—for I cannot think of a better example of “enlighten” than this. We received an overflowing amount of support and positive feedback, and the COTP continues to be a top seller for the CLL. We also need to recognize that the small amount of negativity that DIFM has seen in response to the SOP/SOPP and the third module is a teachable moment to serve as a reminder that we still have work to be done in carrying our message forward to empower, enlighten, and energize—not only the field of dietetics but also the practice of nutrition in general. My solemn prayer is for the day when DIFM DPG becomes obsolete—a day when all of dietetics is practiced in a way that encompasses the DIFM vision, values, and mission.

I ask each of you to please help us make this a reality. Use the resources that are part of your membership. Encourage others to join DIFM. Engage in our social media platforms and spread the word. Together we can change the face of dietetics. Send me your vision for DIFM. How can we serve empower, enlighten, and energize you as our members?

Lastly, we have much to look forward to this year. Stay connected to see all that we have in store. DIFM has a wonderful Saturday symposium planned—come join us in Philly! Seek me out and say hello.

Let’s make this DIFM’s best year yet!

In health & wellness,

Dana Elia, DCN-c, MS, RDN, LDN, FAND
of Manuka plant–based honey dressings for wounds in 2007, and honey dressings are considered an acceptable treatment for certain chronic wounds.6,19 As part of the multidisciplinary medical team, it is helpful for RDNs to be familiar with this healing action of honey.

Another area where there is mounting evidence supporting the therapeutic solution of honey is in the treatment of radiation-induced oral mucositis (OM) in head and neck cancer (HNC) patients. In a single-blind randomized control study by Rao et al, oral honey application was found to delay the onset of OM, reduce its incidence, and decrease both treatment breaks and the incidence of intolerable mucositis (without interfering with tumor cell killing) over standard Betadine treatment.20 Amanat et al found that 20 mL of a honey rinse three times per day reduced the incidence of Grade 3 OM versus a saline control in HNC patients.21 A third randomized study found that a rinse of 20 mL honey in 100 mL of purified water applied three times a day for seven weeks versus a saline control led to a decrease in the mean OM grade versus an increase in the control group, along with improvements in swallowing, eating, oral pain, and weight loss in HNC patients. A meta-analysis of eight additional studies found that honey treatment led to statistically significant improvements in treatment interruptions, weight loss, and time to OM onset (but not severity).22 A separate meta-analysis found that honey treatment can reduce the severity of OM.23 These studies suggest that Manuka honey specifically may not be effective for this purpose.25 Additional research is warranted, and oncology RDNs may want to monitor new developments in this area closely.

It has also been reported that honey can be used to treat various gastrointestinal disorders, including gastritis-induced diarrhea6,34 Interestingly, a growing body of research is being conducted on bee pollen for any of these purposes.31 Pollen supplementation is not well supported by the literature at this point in time.

Royal Jelly
Royal jelly (RJ) consists of carbohydrates; proteins; lipids; sugars; bioactive substances; and vitamins and minerals such as riboflavin, thiamin, niacin, folic acid, calcium, sodium, potassium, zinc, and several others. It has been shown to have antibacterial, anti-inflammatory, antioxidant, antitumor, and other key properties.24,25 Interestingly, a growing body of research is being conducted to look at the possible effects of RJ supplementation on modulating lipid profiles and regulating glucose metabolism. Possible proposed mechanisms of action include the fact that RJ is high in bile acid–binding proteins which both inhibit absorption and promote the excretion of bile salts and cholesterol,35,36 as well as biologically active substances that mimic insulin activity,1,57 and/or antioxidant peptides that protect against oxidative stress associated with insulin resistance.1,59

A review of the literature uncovered six placebo-controlled primary studies and one meta-analysis that examined the cardiovascular and/or glucose-regulating effects of RJ supplementation on glucose-modulating parameters, including serum glucose levels, HbA1c, a homeostasis model for insulin resistance, and/or serum insulin levels, with dosages ranging from 1000 mg to 3000 mg per day.36,38 Additionally, all four studies that looked at cardiovascular markers (dosages ranged from 150-3150 mg/day) reported significant improvement in either Apolipoprotein A (ApoA-I) concentration, Apolipoprotein B (ApoB), ApoA/ApoB ratio, or lipid peroxidation in aged, malnourished rats.33 However, a systematic review in the Journal of Dietary Supplements concludes that there is insufficient evidence to support the intake of bee pollen for any of these purposes.37 This reviewer also found a dearth of clinical evidence to support these purported applications. Bee pollen has been found to contain heavy metals, mycotoxins, bacteria, and other potentially harmful substances and reports of adverse or allergic reactions, including anaphylaxis, have been documented.29,31 Bee pollen supplementation is not well supported by the literature at this point in time.

Bees and Malnutrition
Bees and other pollinators are a critical underpinning of our global food system, with bees in particular having been described by some researchers as “the most important global pollinators,”42 credited with helping to pollinate around 75% of the top 115 global crops.43,44 Not only do they pollinate, but also bees provide significant nectar and pollen for animal and human consumption.45,46 However, malnutrition around the globe has been shown to overlap with regions that rely heavily on crop pollinators to produce crops rich in those nutrients.42,43 Areas with the highest reliance on pollinators for food production often have the highest rates of nutrient deficiency-related nutritional deficiencies, such as vitamin A,47,48 and may rely heavily on crop pollinators to produce crops rich in those nutrients.42,43 Areas with the heaviest reliance on pollinators for food production often have the highest rates of nutrient deficiency-related nutritional deficiencies, such as vitamin A,47,48 and may rely heavily on crop pollinators to produce crops rich in those nutrients.
diseases. For example, it has been reported that the risk of vitamin A deficiency triples in regions of the world that are highly dependent on pollinators to produce vitamin A–rich crops compared with areas that are less dependent on pollinators.\textsuperscript{43} Likewise, iron-deficiency anemia in pregnant women is reportedly three times higher in regions that have a moderate to high reliance on pollinators for plant sources of iron.\textsuperscript{44}

Unfortunately, bees are vulnerable to numerous modern challenges, including insufficient wildflowers, reduced plant diversity resulting from the rise of monocrops, parasites, pests, and the widespread use of pesticides (including neonicotinoids) and fungicides.\textsuperscript{42,48,49} What, then, does this mean for human nutrition? Despite some media reports, there are knowledge gaps and inconclusive data regarding the status of bee colonies worldwide. The number of managed honeybee colonies declined markedly in central Europe (down 25%) and North America (down 59%) from 1985-2005; although this was coupled with a corresponding and greater increase in the number of managed colonies in China, Argentina, and elsewhere.\textsuperscript{40} Of the 22,000 wild bee species, however, available data demonstrates that bumblebees and other species have experienced significant range contractions with numerous species declining in number or going extinct.\textsuperscript{49}

All told, only 5% to 8% of total global food volume relies directly on pollination services, whereas the rise in pollinator-reliant crops has far outpaced that of pollinator-independent crops (by some accounts, tripling or more),\textsuperscript{49} making worldwide food production substantially more dependent on pollinators than ever before.\textsuperscript{42,49} There is then a consensus on whether or not we face a widespread pollination crisis, there is evidence that, at a minimum, localized agricultural crops face pollinator-driven limitations in yield.\textsuperscript{49}

As such, protecting and supporting pollinators is an important undertaking. There are several simple steps RDs and others can take to help promote and support the viability of bees and other pollinators. These include planting a patch of wildflowers or a bee garden. Sunflowers, goldenrod, purple coneflowers, lavender, hyacinths, sedums, snapdragons, and zinnias are all attractive to bees. Other pollinator-friendly actions include mounting a bee house, avoiding or reducing pesticide use, choosing natural fertilizers, supporting local beekeepers by buying local honey, and/or buying organic produce.

### Reference

The Low-Histamine and Anti-Inflammatory Diet in Clinical Practice

Leslie Langevin, MS, RD, CD

Leslie Langevin is the author of The Anti-Inflammatory Kitchen Cookbook, which is a nutrition guide for the low-histamine, anti-inflammatory diet. With over 100 recipes, The Anti-Inflammatory Kitchen Cookbook assists patients to follow a guided low-histamine and anti-inflammatory elimination diet and then reintroduce foods into their diet. Leslie co-owns Whole Health Nutrition, LLC, which is located in South Burlington, Vermont. Leslie works with individual clients and teaches nutrition and lifestyle classes. For more information, visit www.anti-inflammatorykitchen.com. Contact Leslie at leslie@anti-inflammatorykitchen.com.

Introduction

There is increasing evidence that using anti-inflammatory eating patterns such as the Mediterranean Diet reduces the risk of heart disease, cancer, arthritis, type 2 diabetes, allergies, and other inflammatory conditions. There has been less research about using a low-histamine diet. Approximately 1% of the population has histamine intolerance; and symptoms can be less research about using a low-histamine diet. Approximately 1% of the population has histamine intolerance; and symptoms can be

Histamine is a biogenic amine that helps with many bodily reactions. For example, it helps stimulate gastric acid secretion in the stomach and controls cell contraction, vasodilation, and blood pressure. So, histamine itself isn’t bad, but excess histamine can lead to symptoms. Microbes can also secrete histamine in the gastrointestinal tract. When mast cells are stimulated, they release histamine and inflammatory cytokines as well as other molecules in the body which can also increase systemic inflammation. The body has two enzymes that are responsible for breaking down histamine: diamine oxidase (DAO) and histamine-N-methyltransferase (HNMT). Symptoms of excess histamine in the body may occur when the enzymes that are supposed to clear histamine from the body are not working well enough. Histamine intolerance symptoms that result can be allergic reactions (ranging from sinus and ear symptoms to anaphylaxis), diarrhea, headache, congestion, asthma, hypotension, arrhythmia, hives, flushing and brain fog, acid reflux, atopic dermatitis, and eczema. The DAO enzyme scavenges extracellular histamine while HNMT metabolizes intracellular histamine. Many individuals with Inflammatory Bowel Disease (IBD) or Irritable Bowel Syndrome (IBS) may have altered DAO or HNMT levels. DAO is produced in the intestines so inflammation and changes in the microbiome in individuals with IBS or IBD can impair DAO production. A lack of DAO enzyme is a proposed theory on why individuals with eczema, IBS, IBD, migraines, interstitial cystitis, asthma, and allergies have more histamine intolerance symptoms. Histamine levels can build up gradually over time if there is not enough enzyme activity to break down the body (either the histamine the body produces itself or the histamine that is ingested), and as the histamine intolerance increases there will be more and often heightened symptoms. Following the low-histamine diet and using supportive medications and supplements can allow the body to recover and breakdown the existing high histamine levels. Research has shown that following a low-histamine diet for 6 to 12 months improves patients’ DAO enzyme levels, and patients are able to eat more high histamine foods after that period with fewer histamine-related symptoms. In Mast Cell Activation Syndrome or Mastocytosis (a rare genetic disorder) the mast cells are overactive and release excess histamine even if there is not an IgE allergen or other trigger present. These individuals have a variety of symptoms similar to histamine intolerance but often have more severe symptoms and reactions including anaphylactic shock. A low-histamine diet is helpful to try for individuals with histamine intolerance or Mast Cell Activation Syndrome.

Eczema

Studies have found that following the low-histamine diet reduces the severity of eczema. One study found that after following the low-histamine diet for only 1 week, 30% of participants showed improvements in symptoms of eczema. The study proposed that individuals with eczema have lower DAO enzyme levels. Headaches and Migraines

Research has shown that individuals with migraines or headaches may have a deficiency of DAO enzyme. Common migraine triggers like alcohol (red wine), chocolate, aged cheese, aged meats, and condiments are all foods which are high in histamine. A low-histamine diet has been found to reduce headaches by 73% in only 4 weeks.

Chronic Urticaria (Hives)

Chronic urticaria (hives) is a presentation of itchy wheals or swelling of the skin for over 6 weeks. It can be related to a defect in histamine metabolism and the majority of cases occur for no known reason. Mast cells are the primary cells of concern in chronic hives because they release histamine and other inflammatory mediators. Chronic urticaria is also thought to be related to a defect in histamine metabolism and the HNMT and DAO enzymes not working properly. In patients following the low-histamine diet and anti-allergen diet, 30% had their chronic hives in remission, 30% had their chronic hives in partial remission, and 40% had transient relief. Histamine levels also reduced back to a normal level after following the low-histamine diet. Another study found that 75% of patients with chronic hives and gastrointestinal symptoms improved after following a low-histamine diet for 3 weeks.

Irritable Bowel Syndrome and Inflammatory Bowel Disease

Research has shown that mast cells are increased in patients with IBD. HNMT does not function efficiently in inflammatory tissue, and DAO production is also decreased which increases histamine intolerance symptoms. Diarrhea and IBS symptoms are common histamine intolerance symptoms. Research has shown that 50% of individuals with IBS who consumed high-histamine foods had increased IBS symptoms. Because IBS symptoms are correlated with histamine levels, it has been found that mast cell-stabilizing
medications such as cromolyn sodium reduce some IBS symptoms.2

Identifying Histamine Intolerance

To identify a patient’s histamine intolerance, the patient must present with two or more of the following symptoms and show improvement after following a histamine-free diet with the use of antihistamines.2 Patients should also have IGE food allergy testing to rule out any true food allergies. The symptoms to watch for include atopic dermatitis, eczema, headaches or migraines, IBS, diarrhea, IBD, allergies (sinus issues, tinnitus), tachycardia, anaphylaxis, arthritis, heartburn, flushing after eating, chronic urticaria, anxiety, fatigue, chronic pain, brain fog, Ehler’s Danlos, Postural Orthostatic Tachycardia Syndrome (POTS), interstitial cystitis, and hypertension.11 If a patient has more than one of these conditions, then they may benefit from the low-histamine diet.

Supportive Supplements

Supportive supplements may help the body get the building blocks needed to help breakdown histamine. These include:

• Probiotics with bacteria that break down histamine: Bifidobacterium infantis or Lactobacillus planatarum12
• Vitamin C: 1000 mg is recommended to support DAO production12
• Vitamin B6: ensure adequate intake through diet or a supplement meeting the Recommended Dietary Allowance to support DAO production12
• Quercetin (a mast cell–stabilizing bioflavonoid shown to decrease histamine release from mast cells and improve histamine intolerance symptoms): 250–500 mg is recommended per day13,14
• DAO enzyme supplements: If there is a deficit in DAO as the reason for histamine intolerance symptoms, then replacing DAO is an effective way to reduce symptoms. One study found that DAO supplements reduced symptoms in histamine-intolerant individuals when given a 75 mg oral histamine dose.15

The Low-Histamine Diet

The low-histamine diet should be followed like an elimination diet. Remove as many “avoid/high histamine” foods for at least 4 weeks as is feasible, then add back in one food at a time. Many individuals have to follow the diet base for life but are able to add in a few higher histamine items. Some patients will never tolerate some of these foods; but as histamine levels reduce, patients may be able to tolerate more of the avoid/high histamine foods. The diet is based on a Mediterranean Diet eating pattern (anti-inflammatory) with a low-histamine layer on top. Unfortunately, there is no universally determined list of low-histamine diet–friendly foods, as more research is needed, Table 1 is compiled from two of the most highly referenced lists by Dr Janice Joneja, who wrote the list for the Academy of Nutrition and Dietetics, and the Swiss Interest Group Histamine Intolerance (SIGHI) group.16,17

Since certain bacteria produce histamine, it is important to tell patients to freeze leftovers containing protein after it is cooked to avoid bacterial replication in the refrigerator. Any aged, fermented, or mishandled foods are much higher in histamine than many fresh foods. Table 1 is a chart of the foods to avoid and the foods to eat on a low-histamine diet.

Overall for the low-histamine diet to be effective, food being consumed should be as close to the source as possible. The diet is mostly fresh; some exceptions include items made from scratch or store-bought items that are preservative-free items, food coloring-free, and additive-free, and avoid aged or fermented foods or ingredients. The diet follows a Mediterranean Diet distribution of high amounts of acceptable fruits and vegetables, high amounts of acceptable seeds/nuts, high amounts of olive oil as the preferred fat source, low amounts of dairy, and low to moderate amounts of lean meats with a few servings of fish per week.

After eliminating all of the “avoid” foods for 4 weeks while following an anti-inflammatory base diet, a patient will be able to immediately ascertain whether they are seeing improvements in their symptoms. If improvement is seen, be careful not to rush to liberalize the diet. Research studies have shown it may be beneficial to follow the diet for 6 to 12 months to allow the body to recover its DAO enzyme production.2 Patients may slightly liberalize the diet by adding a small amount of

Table 1. Low-Histamine Diet Foods List

<table>
<thead>
<tr>
<th>Foods to Avoid</th>
<th>Foods to Eat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables: spinach, tomatoes, avocados, eggplant, soy, red beans</td>
<td>Vegetables: leafy greens, carrots, sweet potatoes, winter squash, bell peppers, broccoli, onions, garlic, cauliflower, black beans, chickpeas, lentils, peas</td>
</tr>
<tr>
<td>Fruit: citrus, raspberries, strawberries, pineapple, kiwi, dried fruit, banana</td>
<td>Fruit: apples, mangoes, blueberries, cranberries, pears, peaches</td>
</tr>
<tr>
<td>Meats/proteins: aged meats (deli meats, pepperoni, sausage), anything made with broth or marinades, pork, fish that is not fresh (the safest is frozen at sea and for patients to cook from frozen at home)</td>
<td>Meats/proteins: fresh chicken, turkey, fresh fish (frozen at sea is the best option), grass-fed beef occasionally</td>
</tr>
<tr>
<td>Dairy: aged cheeses, yogurt, kefir</td>
<td>Dairy: milk, plant-based milks (be careful of additives), mascarpone cheese, fresh mozzarella, ricotta cheese</td>
</tr>
<tr>
<td>Nuts/seeds: walnuts/pecans</td>
<td>Nuts/seeds: sesame seeds, pumpkin seeds, macadamia nuts, cashews, chia seeds, peanuts</td>
</tr>
<tr>
<td>Grains: yeast breads, breads with many preservatives</td>
<td>Grains: well tolerated by most (the book features a gluten-free diet, but wheat is often tolerated by many): crackers; yeast-free breads like biscuits, muffins, quick breads, tortillas</td>
</tr>
<tr>
<td>Condiments/other: yeast, any aged condiment like soy sauce, fish sauce, balsamic vinegar, packaged salad dressings, lots of refined sugars, warming spices: cinnamon, nutmeg, cloves, allspice</td>
<td>Condiments: fresh herbs, garlic, onions, olive oil, coconut oil, butter in moderation, cumin, paprika, white or apple cider vinegar is more tolerated but avoid initially, a little lemon juice or lime juice for cooking, vanilla extract, ginger, turmeric</td>
</tr>
<tr>
<td>Beverages: green and black tea, excessive coffee, juices from fruits to avoid, alcohol</td>
<td>Beverages: acceptable juices from fruits above, herbal teas, coffee in moderation, water</td>
</tr>
</tbody>
</table>

After eliminating all of the “avoid” foods for 4 weeks while following an anti-inflammatory base diet, a patient will be able to immediately ascertain whether they are seeing improvements in their symptoms. If improvement is seen, be careful not to rush to liberalize the diet. Research studies have shown it may be beneficial to follow the diet for 6 to 12 months to allow the body to recover its DAO enzyme production.2 Patients may slightly liberalize the diet by adding a small amount of avocado, for example, but eating a deli turkey and cheddar sandwich is not recommended. As with all elimination diets, dose dependency also has an influence on symptoms. Add one food back every couple of days, but save the very high items like deli meats, bacon, cheese, or items that would be high in bacteria or fermentation like wine, balsamic vinegar, or soy sauce to add back last. Keeping food as minimally processed as possible is still a good long-term recommendation. Moreover, some
patients may need to follow the diet for life with only a few restricted foods added back in to avoid the recurrence of symptoms.

Many registered dietitian nutritionists (RDNs) will find that the medical community is unaware of the influence histamine in foods can have on many different health conditions. RDNs are well-positioned to help educate patients on this helpful diet and share this research with other health care professionals. Supportive supplements or supportive medications such as antihistamines and mast cell stabilizers may also be necessary for maintaining mast cell stability. The Anti-Inflammatory Kitchen Cookbook is one resource for providers and patients which provides a 30-day low-histamine and anti-inflammatory elimination diet and over 100 recipes. Hopefully more research will result in additional information about the relationship of the low-histamine diet with various diseases, conditions, and symptoms and how it can help patients live happier, healthier lives.

References

Healing Food Sensitivities: One Clinician’s Personal and Professional Journey

Alison Anderson, MS

Working with clients wishing to overcome their unique food sensitivities, I have learned that, beyond the science, food sensitivities are a symptom that can offer tremendous healing opportunities. While customized dietary protocols are an important piece of the puzzle, essential spiritual and emotional messages can be unraveled, explored, and healed in tandem. A client’s personal experiences of food avoidance and reinvention can serve as a gateway, allowing not only for a new dietary perspective, but also by offering a richer and more expansive way of living.

In our professional training we were taught to look for any food sensitivity cues and then provide physical solutions, such as dietary education and tailored meal plans. Some of us order blood panels to get a better picture of physical functionality. It is our great hope that in due time, the body will heal itself naturally and quickly to get a better picture of physical functionality. It is our great hope that in due time, the body will heal itself naturally and quickly.

From my nutrition studies, I knew that the brain has significant control over our genetic expression with our food and lifestyle choices. From doing further exploration on the topic of epigenetics, I learned that our body’s ability to heal itself is also greatly affected by our beliefs, thoughts, emotions, and intentions. The mind has two states: conscious and subconscious. Neuroscience has now revealed that when we have a conscious level goal that differs from our subconscious belief system, our probability for success is diminished. So, for instance, your client may have a conscious goal to eat healthier, but their subconscious mind, often programmed from childhood, tells them at some level that they don’t know how to take care of themselves. As a result, their own self-sabotage may kick in. While the estimates vary, the subconscious generates data at about 40 million bits per second and the conscious mind is only at 2,000 bits per second. A conflict between the conscious and subconscious mind results in stress to the cells which can compromise the immune system and limit one’s ability to heal at some level.

Our subconscious programming originates from life experiences as well as from societal influences. If one has a traumatic experience as a child, and there is food involved in any way, there is a potential to create a connection between that food and the perceived negative emotional experience. This may then create physical changes in the body each time that person consumes that food. There are hormonal changes happening all the time depending on what a person consumes. Keep in mind that there may also be emotional connections surfacing, not just science-driven data aligned to a specific food grouping, for instance. A diagnosis such as leaky gut may help explain why certain people will react better to certain foods than others; but from my own clinical studies and experiences, previous stressors that reach the subconscious can also be profound influencers tied to the diagnosis itself.

The power of the mind when paired with food is fascinating. Current brain research has documented that repetition of actions and thoughts can change the complex circuitry of the brain. If a client has a habit of labeling foods as either good or bad, it has been documented that food becomes the influencer tied to the diagnosis itself. The power of the mind when paired with food is fascinating. Current brain research has documented that repetition of actions and thoughts can change the complex circuitry of the brain. If a client has a habit of labeling foods as either good or bad, it has been documented that food becomes the influencer tied to the diagnosis itself.
thought margarine was better for us?

By replacing the limited mindset with new desired beliefs through mind-body energetic processes, new pathways at the subconscious level took shape. These energetic healing modalities were a combination of methods I learned over time such as Emotional Freedom Techniques, PSYCH-K®, and Healing from The Body Level Up™. If one looks at the body as an energetic system, the methods used help to activate more life-force energy from within by reducing or eliminating fears and other sources of stress. One process helps to connect the right and left sides of the brain so that a whole-brain, non-stressed state is achieved. Using simple cross-over patterns of the body, the subconscious brain can “reprogram” itself and then send positive signals to the body to assist with its healing.

By asking my clients the right questions, they are often guided to their core issues. I use a biofeedback tool called Applied Kinesiology (muscle testing) to confirm the client and I are on the right path with questions and their answers. Muscle testing is used by health practitioners to determine which supplements or chiropractic adjustments are best for the individual. In my work, I use this tool to better understand the programming of the subconscious and what the mind, body, and soul needs to heal. While science continues to debate its validity, many practitioners continue to use muscle testing with success and deem it to be a clinically useful tool. Through a series of questions and client responses, we can then determine the best protocol. Sometimes this will be about changing belief patterns, but in other cases it might be about forgiveness, practicing gratitude, resolving internal conflicts, or establishing some sort of energetic boundary. In certain cases, the best protocol may be the whole-brain exercise discussed earlier, using an energetic process based on timeline therapy, or even something as simple as journaling.

This unique, alternative pathway of healing food sensitivities provides me and my clients a sense of freedom and joy, two important emotions that can help the body to thrive. As it happened for me, once an individual can let go of a scarcity mindset with food, other areas of life can blossom.

Here are three client case studies to help illustrate the profound effect that energetic healing, in collaboration with physical self-care, can have in helping heal food sensitivities.

**Case Study #1**

Sarah started working with me to address her food and supplementation sensitivities and intolerances. She reported that “false” food, herb, supplement, and medication bothered her because she was so sensitive. Sarah felt desperate to heal. Yet, every healing remedy she tried often led to more symptoms. She shared how stress, fear, and anxiety were an integral part of her life. During her first session, we began looking at her fears. Using coaching and whole-brain exercises, she gradually moved from a state of fearing the worst to happen to one where she then expected the best to happen. Once she collapsed this and other fears and anxiety, we were able to start working on her beliefs around food. After several sessions together, she reported, “When I started having sessions with you, I was in a very deep dark hole, and I feel like I am now coming out in the sunlight!” One interesting food that she worked through was her sensitivity to squash. As it turns out, this was triggering her fears of being squashed by her father as a child. By going through the whole-brain process she fully forgave him for “squashing her personhood,” and is now not only enjoying the health benefits of dietary squash but also having healthier relationships.

**Case Study #2**

Mindy, like Sarah, had longstanding and severe food sensitivities, particularly to eggs and gluten. When we worked together on her intolerance, she needed to transform her negative feelings while consuming eggs to a positive mindset. Through intuition, coaching, and muscle testing, we determined for her to create a first-person present statement around how she wished her experience of eating eggs to be. Often, we are focused on what we don’t want. This process helps to shift into a state of what we do want. She went into a cross-over position with her body to help shift this belief at the deep layer of her subconscious. By doing so, she transformed her experience of eating eggs from a feeling of moody and angry to one of good nourishment and enjoyment.

After I work with a client on a food sensitivity, they go into the real world and try that food to see how they react. After her first trial with eggs, Mindy said she had made “huge progress.” However, she was now experiencing a headache and some belly discomfort. As I do with all my clients, we followed the energy and honored what her body was telling us. In this process, I also work with charts from various healing modalities—Traditional Chinese Medicine and others that tie specific emotions to various body systems and organs. While accessing one of my emotional charts, I was guided to have her explore the emotion of “resentment.” “When I mentioned resentment,” something popped into her mind. She equated this to her own personal belief that “Life is set up, so I’ll never win!”

Some clients will be as intuitive as Mindy and others will need more guidance and information to help them understand what the emotion is about. Of course, she didn’t want that belief, so she created a new belief: “Life is MY adventure.” She again used the whole-brain exercise to help her with full processing at the subconscious; and ever since, she’s been happily consuming eggs without any symptoms whatsoever.

**Case Study #3**

Kim expressed an enthusiastic interest in working on her food sensitivities to gluten, corn, soy, and canola. Under the guidance of a naturopathic physician, she successfully followed an autoimmune paleo diet. However, after being on this plan for a year, she decided to start working with me as well. Like many of my food sensitivity clients, her goal was to have greater freedom with her food choices. Kim also desired fewer physical symptoms. While she did most of her cooking, whenever she ate out, she had fears about cross-contamination. Often, after eating outside of the home, she had physical symptoms that lasted for days.

After just four sessions, Kim cleared her gluten intolerance and no longer showed antibodies in her bloodwork done by her naturopath. During her fourth session, Kim was still working through her gluten challenges. One of her biggest transformations in that session was to rewrite her experience of leaving a spiritual community. This connection was made by accessing her subconscious through the muscle testing and asking a series of questions. One question guided us to a situation at a certain time frame in her life. Once we identified the time frame, she shared her perceived trauma and was able to heal this by using a process based on timeline therapy. She created a new belief, “I belong everywhere.” This allowed her to experience greater fulfillment in her current spiritual community and enjoy the comradery of a meal with her gluten-loving friends. While she does not eat gluten regularly, she now enjoys the freedom of being able to have a slice of pizza when she is traveling.
How can you best serve your clients who are struggling with food sensitivities?

If you are new to energy-healing work or wondering how you can begin to incorporate more of this multidimensional approach into your integrative and functional nutrition practice, here are a few steps:

• Listen to your clients share the fullness of their story. Let them expand beyond food sensitivities and physical symptoms. Allow their story to unfold over the course of many sessions. Ask questions with gentle care in order to understand if there are any emotional, spiritual, or other nonphysical factors.

• Remind yourself and your clients that life and healing is a series of awakenings, instead of approaching it as a destination.

• Ask your clients to build more of their own awareness with the foods they are eating. If you are having them keep a journal, consider having them go deeper.
  ○ Do they hold any memories (positive or negative) around certain foods?
  ○ What do they say to themselves before, during, or after sitting down for meals?

• In certain cases, and if the client is inspired to do so, it may be helpful to have them work directly with an energy healer as part of their healing journey. Allow your client to honor their own intuition to select the healer that resonates most for them.

• If you are suffering with your own food sensitivities, consider going within. By going beyond the physical realm, you will be able to meet your clients at new awakened levels.

In closing, it is sometimes through dissatisfaction with our own health or life circumstances that we are guided to take new approaches. While my path was not expected, it is one that has opened unimaginable doorways beyond enjoying all the freedoms in my diet. During my healing journey, I met my husband, changed my career path and specialty, improved my health, created a stronger spiritual connection, and so much more. Clients are also uncovering their own great capacity to heal at levels beyond food. Keep listening to your clients so that their deeper connections can be revealed for their own personal growth and fulfillment.

References
WHY AGE GRACEFULLY, WHEN YOU CAN AGE SUCCESSFULLY? Our bodies can be younger or older than our actual age depending upon diet, lifestyle choices and physical activity. This is called biological age, which could be different than the age on your driver’s license, which is called chronological age. A recent study of over 900 adults who were tracked for 12 years, from ages 26-38, showed that people who were aging faster, meaning that their biological age was higher than their chronological age, were not as healthy or physically fit. This group was also more likely to show cognitive decline and was at a greater risk for age-related health conditions.

A growing body of research demonstrates that the keys to aging successfully are a combination of exercising regularly, keeping engaged with life, and maintaining a healthy diet with nutritious foods. These three key elements could contribute to aging gracefully, and successfully, too. POM Wonderful 100% Pomegranate Juice, known for its antioxidants, is part of a healthy diet.

THE ANTIOXIDANT SUPERPOWER IN A BOTTLE. One easy way to get a head start on aging successfully is to add something like POM Wonderful 100% Pomegranate Juice to your daily routine. POM contains pomegranate polyphenols, antioxidants known to combat unstable molecules that can cause damage to your cells. These harmful molecules are called free radicals. To maximize the polyphenol antioxidant levels, every 16oz bottle of POM contains the juice from four whole-pressed pomegranates.

An in vitro study at UCLA found that pomegranate juice has, on average, more antioxidant capacity than red wine, cranberry juice or green tea. It’s easy to enjoy all the healthy benefits of pomegranates every day with POM Wonderful 100% Pomegranate Juice. It’s great alone or added to your favorite breakfast smoothie. So make POM part of your daily routine. Your body will thank you.
News You Can Use

Julia Shuff, RDN, LD, is a foodie at heart who also happens to be a dietitian. She believes in food’s natural ability to nourish our bodies and understand, in great depth, how to harness food’s power so we can feel our best. Follow her on Instagram at @acoupleofdietitians.

Geanna Revell is a brand new dietitian who is currently enjoying life without homework! Her non-food interests include reading, sailing with her husband, and snuggling her cat. She lives in Seattle. Follow her on Instagram at @geannarevellrdn.

Upcoming Conferences and Educational Opportunities


Electronic Mailing List (EML) Recent Topics Review

- Medication-induced vitamin deficiencies: patient is taking Lamictal and has low vitamin D and B12. DIFM members recommended the patient go on a gluten-free diet, take B12 injections, and take vitamin K2 along with vitamin D supplements.
- Members recommended the following HIPAA-compliant telehealth platforms: Practice Better, GSuite, Simple Practice, and Healthie. Doxy was mentioned as well, but members complained that it didn’t work about half of the time.
- Resources were given to determine the presence of heavy metals and other contaminants in protein powders and supplements. Resources included Consumer Labs and the Clean Label Project (https://www.cleanlabelproject.org/product_category/protein-powder/).
- A member asked about a patient suffering from UC and anorexia nervosa who had an HbA1c of 3.0. Responses concurred that that was likely an inaccurate reading, due to the patient’s possible anemia and increased red blood cell turnover, and suggested getting a fructosamine test, as well as assessing the results of the patient’s CBC, iron panel, folate, and B12 tests.
- Protein powders with “clean” ingredients were suggested and brands included Phood, Orgain, Now Foods, Vega, About Time, Truvani, Trader Joe’s, Swanson Vitamins, Natureade, Noosh, and Naked Nutrition.
- The following suggestions were given for probiotics for someone with Clostridium difficile: Florastor, Ultra Flora Spectrum from Metagenics, Microbiome Labs, and Saccharomyces boulardii from either Pure Encapsulations or Xymogen.
- A member wrote in asking about MNT for protein-losing enteropathy. Members suggested checking the patient’s nutrient status (such as B vitamins, fat soluble vitamins, etc), restricting dietary fat intake to 5 to 20 grams of total fat, excluding MCT oil, and checking if patient has steatorrhea.
- For a patient undergoing treatment for breast cancer who complains of hot flashes, the following suggestions were given: using Blue Oil by Aveda externally, wearing light clothing, keeping the room temperature down, and trying Acteane by Boiron. Members noted being wary of herbal remedies that might interfere with the treatment.
- Protein sources that were vegan-friendly and low-FODMAP were offered: brown rice or pumpkin seed-based protein powders, 1 cup cooked quinoa, pumpkin seeds, ¼ cup canned and rinsed chickpeas, ¼ cup lentils, nondairy milks that are made from protein and not the whole bean or nut source, 1 cup tofu, ¼ cup tempeh, seitan, chia seeds, pumpkin seeds, and all nuts and nut butters (except large amounts of pistachios and cashews).

What’s New – Journal Reviews and Resources

Mind Over Milkshakes: Mindsets, Not Just Nutrients, Determine Ghrelin Response

This study sought to determine to what degree peoples’ mindset have control over their hunger, or more specifically, the hunger hormone ghrelin. Forty-six study participants, ages 18 to 35 years old, were given identical 380-calorie milkshakes on two different occasions one week apart. One week, they were told the milkshake was “indulgent” at 620 calories and the other week they were supposedly given the “sensible” version that had only 140 calories. The participants’ ghrelin hormone was tested after drinking the shakes. The results showed that participants had drastically lower ghrelin levels when they thought they were drinking the indulgent shake versus when they thought they were having the diet drink. The study concluded that a person’s perception about what they are eating can be a larger determining factor than the actual nutritional value.


Blueberries Improve Biomarkers of Cardiometabolic Function in Participants with Metabolic Syndrome

This six-month, double-blind, randomized controlled trial studied the effect of blueberry intake on hallmarks of metabolic syndrome, including insulin resistance, hypertension, and endothelial function. A total of 115 participants,
aged 63±7 years, were either given ½ cup or 1 cup a day of blueberries, or the matched placebo for six months, after which biomarkers indicative of metabolic syndrome were tested and assessed. At the end of the study, the group who consumed only ½ cup of blueberries each day showed no changes in their biomarker tests. However, the group who consumed 1 cup of blueberries every day showed improved cardiometabolic markers, including improved endothelial function, improved systemic arterial stiffness, and increased HDL cholesterol (specifically in the participants who didn’t take statins). The participants’ insulin resistance and blood pressure were not affected either way by ingestion of daily blueberries.


**Estimates of Mortality Associated with Proton Pump Inhibitors Among US Veterans**

This 10-year observational cohort study followed over 200,000 patients as they began taking proton pump inhibitors (PPIs) or H2 blockers to determine the risk of mortality associated with taking this type of medicine. The results found that after long-term use, there was an increased risk of cause-specific mortality due to cardiovascular disease, chronic kidney disease, and upper gastrointestinal cancer.


**Hot Nutritional Genomics Topics**


This primer on nutritional genomics explains how our genetics can affect our responses to nutrition (nutrigenetics), and how our nutrition can also affect our gene expression (nutrigenomics and epigenetics).


Although the authors say there is little evidence for gene-based weight management recommendations, they still describe the use of genetics as “innovative and promising” for both the prevention and treatment of obesity. Table 2 lists some companies that offer gene-based recommendations for weight loss.


Discussion of the growing evidence for how genetic variants can affect nutritional status, body composition and sports performance. Table 1 lists specific gene variants in the following genes: CYP1A2, ADORA2A, BCO1, MTHFR, HFE, TMPRSS6, TF, GSTT1, GC, PEMT, MTHFD1, FTO, TCF7L2, and PPARG which can be relevant.


This article highlights the interest and need for more genetics and related “omics” education among health professionals, who can then also help members of the public.


Fatty acids are discussed in relation to metabolic syndrome and personalized nutrition (nutrigenetics/nutrigenomics and related omics such as transcriptomics). Table 2 provides a listing of relevant genes, with tables 3-6 providing a listing of relevant gene variants.


This article describes both nutritional and environmental effects on DNA methylation and epigenetics, especially with regard to cancer risks, eg, breast cancer. Table 1 provides a listing of some dietary components which have been studied. The authors suggest that better understanding of the molecular mechanisms will become increasingly important for public health.


Recently, the growth of direct-to-consumer genetic testing has been increasing at an exponential rate, and the authors anticipate continued rapid growth during the next few years at least, leading to scientific innovations and insights.

**Genome-wide polygenic scores for common diseases identify individuals with risk equivalent to monogenic mutations. *Nat Genet.* 2018 Sep;50(9):1219-1224. doi:10.1038/s41588-018-0183-z (PubMed ID: 30104762)

Genetic risk scores associated with greater than three-fold increased risk were identified for the following diseases among those of European ancestry (for which more studies are available): coronary artery disease, atrial fibrillation, type 2 diabetes, inflammatory bowel diseases, and breast cancer. The ability to identify individuals with increased risk poses both opportunities and challenges, including consideration of environmental factors and the development of preventive strategies, as well as the minimization of healthcare disparities.

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Unlimited, Inc, ron@nutrigenetics.net. The database at Nutrigenetics.net is available to the public free on weekends (US Pacific time) by using “Free” as the username and “Weekends” as the password, as also shown on the login page at https://nutrigenetics.net/Login.aspx. Check out www.NutritionAndGenetics.org to learn more about ISNN membership discount for dietitians, which includes 24/7 database access plus a subscription to the Lifestyle Genomics journal (formerly named the Journal of Nutrigenetics and Nutrigenomics).

New DIFM Partner: Academy of Integrative & Health Medicine (AIHM)!

Who is AHIM? AIHM is an interprofessional membership association of diverse health professions working together to shape the future of health care-body, mind, spirit, community and planet. As an AIHM member, you stay connected with this global community that reunites annually at our People, Planet, Purpose Conference and throughout the year via our online platform and in-person Chapter and Student Alliance events. Additionally, AIHM membership offers a variety of benefits that includes a Provider Directory, an Integrative Health Marketing Guide, discounted conference registration, access to TAP Integrative, free online journals and more: https://www.youtube.com/watch?time_continue=23&v=zTP4HvRRy_w

Discounted AIHM Membership for DIFM members! Enter DIFM25 to join here: https://www.aihm.org/general/register_member_type.asp

Additional benefits for DIFM members include a $50 discount to AIHM’s annual conference by using code: DIFM50. Register for the conference here: https://conference.aihm.org/annual/2019/index.cfm

DIFM Saturday Symposium: Hot Topics in Integrative and Functional Nutrition

Saturday, October 26, 2019
8 am to 3:30 pm
Philadelphia, PA
prior to FNCE®

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Saturday, October 26th, 8am-3:30pm
DIFM’s Saturday Symposium: HOT TOPICS IN INTEGRATIVE AND FUNCTIONAL NUTRITION

More Than Meets the Eye: How Unseen Factors Impact Nutrition and Health
David Wiss, MS, RDN

The ever changing and connecting landscape of neuroscience, gastrointestinal health, and the biological embedding of adversity will be the main themes of this presentation. A new theoretical framework will be presented that can help RDNs with case conceptualization in the larger context of behavioral health. Further there will be guidance as to when and how to best collaborate with other treatment providers.  
Sponsored by DIFM

Fasting and Fasting Mimicking Diets in Health and Lifespan
Sebastian Brandhorst, PhD

Fasting and fasting mimicking diets (FMD) have come to the forefront in not only weight loss but in areas such as aging and disease prevention. Hear about current research on this topic and some thoughts from early fasting-based intervention studies. Discover how FMDs alter the microbiome, how they may be regenerative, and can induce systemic anti-inflammatory changes in inflammatory bowel disease. FMD results from clinical trials and their feasibility in human application will be presented.  
Sponsored by Jarrow

The Efficacy of Probiotic Supplements: Navigating the Strains that Perform
Anthony Thomas, PhD

Interest in probiotics has grown in recent years as evidenced by the growing number of foods, dietary supplements, and beverages currently on the market. As a result, the term probiotic has a high propensity to be misused, only adding to misinformation and confusion among consumers and health care providers. It is important for practitioners to be able to identify products that are of high quality with validated probiotic strains that can positively influence the user’s health and intended application. Dietitians attending this session will be able to better understand probiotic supplements in order to make evidence-based recommendations to their patients.  
Sponsored by Jarrow

Cranberries and Your Health: What the Latest Research Shows
Amy Howell, PhD

This lecture will not only highlight positive clinical trial data, but will include new areas of compelling research regarding cranberries’ influence on the gut microbiome and ensuing effects on cardiovascular and diabetic risk factors. The bacterial anti-adhesion effects of cranberry are not limited to urinary tract health but extend to the stomach for control of ulcer-causing bacteria and to the oral cavity for positive effects on periodontal disease. Learn about how cranberry dosage and form can influence its overall bioactivity and resulting health benefits. Product formulations and dosages will be discussed, including some caveats that could help consumers avoid sub-efficacious products.  
Sponsored by British Columbia Cranberry Marketing

DIFM Members: $99
DIFM Student Members: $79
Non-Members $129

Light lunch will be served. 5 CPE credits (pending)
Go to https://integrativeRD.org/ fnce-2019-philadelphia/ for more information and to register.

Monday, October 28th, 5:30-8:30pm
DIFM Member Appreciation Reception & Awards Presentation
Light cocktail fare & full cash bar available.
The Longevity Diet
by Valter Longo, PhD
Penguin Random House, LLC
ISBN: 9780525534075
$27.00

The premise of Valter Longo’s book The Longevity Diet is simple. When we restrict calories even for short periods of time (in combination with a nourishing diet), it can help to switch on genes that activate stem cells and may help to regenerate cells, organs, and systems in the body to increase longevity and improve health.

Like many functional medicine practitioners, Dr Longo seeks to understand the root cause of disease and improve the function of the body rather than offering temporary solutions or focusing solely on protecting the body with a high intake of antioxidants. He makes a strong case for tapping into the ways we can trigger the body’s innate ability to protect, repair, and replace mechanisms that “maintain an organism’s vigor and functionality” and for the role that nutrition can play in aging and disease prevention. He recommends what he calls the Fasting-Mimicking Diet (FMD), a period of approximately five days where one continues to consume food but in much smaller quantities. Fasting in this way, he claims, allows the body to essentially clear out both damaged and unnecessary cells thus activating the rebuilding of other cells in a process called autophagy. This further supports cellular rejuvenation and switches cells into a protected anti-aging mode. In addition to the benefits that may be offered by periodic fasting, which he claims to be “in tune with evolution,” he emphasizes how food ingredients, in general, are “molecules causing remarkable change in the body.” He highlights how sugar and proteins in excessive amounts combined with poor quality fats contribute to numerous chronic diseases and can affect key genes in the body that are known to accelerate aging. (Namely TOR-S6K, PKA, RAS and IFF-1.) Longo writes that reducing calorie intake, especially from fat and protein, decreases the activity of the growth hormone receptor and the aforementioned genes which may help to increase longevity.

The Longevity Diet, which includes the FMD as a component, is not far from the Mediterranean diet but with less protein (0.31-0.36 grams per lb of body weight) and an emphasis on variety along with reduced sugars and trans fats. Other alternative fasting recommendations include eating only two meals per day with one snack within a 12-hour period and practicing a prolonged fast 2-5 times/year depending on one’s health status. The book includes a two-week meal plan of relatively simple, well-balanced, and mostly plant-based meals. Dishes include minestrone and pumpkin soups, garbanzo bean and farro salads, as well as pastas with fish and vegetables. His breakfast recommendations tend to be lighter and less protein-rich, like toast and jam or oatmeal and berries, which is in keeping with his lower-protein protocol but which may not work for certain individuals.

None of the recommendations in Dr Longo’s protocol seem particularly far-fetched or extreme, and he also encourages a regular physical activity routine and engaging in a spiritual practice—whatever that may be for someone.

His approach for providing a strong scientific basis for the claims he makes focuses on a methodology that he calls “The 5 Pillars of Longevity.” These pillars include the following: (1) research around “juvenatogy” the study of youth; (2) epidemiology (studying population-based risk factors); (3) clinical studies and trials; (4) studies of centenarians (individuals living to be 100+ years of age); and (5) understanding complex systems, which helps to connect dots and not look at issues in isolation.

Dr Longo takes a cautious approach with his recommendations and is quite clear about whom this diet is not appropriate for such as pregnant, underweight, and elderly individuals as well as those on insulin, or with severe pathologies or disordered eating patterns. He also continually references the necessity of personalizing it to each individual accordingly.

Throughout the book, Dr Longo doesn’t hide the fact that much of the more advanced research has been done in mice and monkeys but offers his perspective that “preliminary results” of clinical studies indicate that the effects of the FMD seen in mice may also be effective in humans. He also highlights his own study of 100 patients who adopted the FMD for five days per month over three months who not only experienced weight loss but showed improvements in blood pressure, glucose, and IGF-1 levels. Additionally, he discusses numerous small and ongoing studies that show promise for various versions of the FMD and other intermittent fasting strategies to be of benefit to those with cancer, diabetes, cardiovascular, and neurodegenerative diseases.

The book reads somewhat easily enough for a layperson (there are a number of personal stories and anecdotal testimonials) but also includes a good deal of scientific language and terminology that may both appeal to and satisfy health practitioners who are curious about the science behind his approach. Of note, Dr Longo started the company L-Nutra, which developed a FMD protocol called “ProLon.” This program can be purchased, and Dr Longo receives no salary from sales.

Mary Purdy, MS, RDN, (DIFM Chair 2017-2018) holds a Bachelor of Science Degree from Bastyr University where she is currently Adjunct Professor. She spent the past 4 years at Arivale as a Coach and Clinical Education Lead providing nutrition and lifestyle counseling to clients using personalized genetic data, functional labs and a food as medicine approach and was in private practice the 8 years prior. She presents regularly at professional conferences and has given over 100 workshops. She is also the host of the podcast “Mary’s Nutrition Show” and author of the book “Serving the Broccoli Gods.”
I attended this wonderful workshop in Seattle in May 2019, presented by dietitian Patsy Catsos, about IBS, FODMAPs, and SIBO. It was an action-packed day relevant to dietitians in many practice settings. Even if you don’t specialize in GI conditions, dietitians likely encounter patients or clients with IBS. It affects about 20% of the US population and 11% worldwide. FODMAP dietitian expert Patsy Catsos presents a series of high-level workshops for dietitians around the country.

Irritable Bowel Syndrome

Irritable Bowel Syndrome (IBS) can be classified as IBS-C (constipation), IBS-D (diarrhea), or mixed IBS. Though bloating and distention are not part of the diagnostic criteria, they are part of the experience of many people with IBS. Some distention due to normal increased gas and water in the intestine should be expected as part of the digestive process, though for some, especially with IBS, this can be painful and uncomfortable. There is some evidence that anxiety can increase heightened visceral sensitivity which causes the experience of normal bloating to be experienced as painful. There is also some evidence that stress and anxiety are linked to IBS—possibly as it relates to binge eating or emotional eating. Poor food choices, or larger portions than usual—which may cause these symptoms. Studies show that mind-body practices like yoga, behavioral therapy, or hypnotherapy can make a difference here.

It’s difficult to know the exact origins of IBS for individuals. Catsos explained that it’s likely a central processing disorder combined with a visceral hypersensitivity to distention. This process is modulated by many factors—diet, stress and anxiety, hormones, inflammation, autoimmune disorders, and intestinal permeability. Another factor is microbial diversity—better duodenal flora diversity can create better outcomes, especially in post-gastroenteritis-induced IBS.

Standard treatment for IBS includes avoiding food triggers by using a foodprovocation test. Further, avoid caffeine and alcohol, which are common triggers. Limit high fat foods and increase fluids and fiber. If there is a definite IBS diagnosis, symptoms respond to standard therapy and diet recall is high or sporadically high in fermentable oligosaccharides, disaccharides, monosaccharides, and polyols (FODMAPS). If a low FODMAP diet might be the appropriate next step. Those who have inflammatory bowel disease (IBD), functional dyspepsia, or celiac disease, yet are still having symptoms, may also benefit from a low FODMAP diet. Catsos encouraged the audience to remember that FODMAPs is not a panacea but rather a treatment for those with IBS and/or SIBO.

Poor candidates for low FODMAP diets include those with no control over food purchasing or preparation, people with poor cognitive skills, anxious children, patients with inflexible food preferences, people at risk for or with an active eating disorder, or those who have a critical illness or major mental health conditions. On an intake form, it can be helpful to ask questions like “Do you have any history of eating disorder?” and “Do you have any concerns about your eating behaviors or thoughts?” to assess the safety of starting a restricted diet. Challenges for starting this diet include people with other restrictions including those that follow a vegan, gluten-free or dairy-free diet, and those with food sensitivities or allergies. Recommendations are to take extra care with these patients and be aware of the diet getting overly restricted.

Catsos emphasized that a low FODMAP diet is not designed to be a long-term diet, but rather a temporary eating plan. It must be started when the patient is ready and the start time makes sense. Clinicians need enough time to educate patients and spend time meal planning so they’re prepared and supported to have as wide a variety of foods as possible. Finally, there are about 15% to 25% of people with IBS who do not get adequate relief from the low FODMAP diet. These patients need to work with a dietitian or RDN to continue exploring what can make their symptoms better.

FODMAS are fermentable short chain fibers or oligosaccharides (fructans, GOS, and inulin), disaccharides (lactose), monosaccharides (excess fructose), and polyols (sugar alcohol or “oligosaccharides”). Effects are cumulative, load-dependent, and delayed, so these factors can sometimes make it difficult for patients to understand why and how they work. FODMAPs are the favorite foods for normal gut bacteria for fermentation which is a normal process; but for some people, excess or painful gas is produced which can cause distention or bloating, pain, and discomfort and possibly even trigger IBS-related constipation or diarrhea. This process can also involve pulling excess water into the gut which may cause more pain and more diarrhea in some people.

FODMAPs are not a food family-based elimination like nightshades, shellfish, or tree nuts. It depends on what type of and how many FODMAPs are in a given food. On this diet, you can’t just eliminate fruits, grains, and/or vegetables as a group. Each type of food within a class can vary. Foods can be altered further by processes like fermentation, soaking, refining, pickling, or drying. Some of these processes increase or decrease FODMAPs so there are nuances here. Raisins for example, have higher concentrations of FODMAPs than the same number of grapes.

FODMAPs also are not IgE-mediated. It isn’t celiac or a peanut allergy, and it’s not a food allergy but it is a chemical reaction like alcohol, caffeine, histamines, or salicylates. It is not a reaction to a toxin, and it’s not immune-mediated. It is not even a mechanism of irritation. It really lives in its own category.

Studies do show that long-term symptom relief is possible for some people with IBS. One 2018 review reported a 70+ percent reduction in symptoms by a majority of participants between 6 and 18 months post—low FODMAP dietary treatment.” Catsos told the audience, “Keep in mind that FODMAPs don’t cause IBS and they do not cure it.” Eliminating these foods is a treatment to help manage the symptoms of IBS.

Though Catsos believes that eating disorders may not be as prevalent in the population seeking a low FODMAP diet as some fear, she does add that avoidance restrictive food intake disorder (ARFID) is likely...
more common in patients with functional gut disorders. This could result in unintended weight loss and further disordered eating patterns.

**Why the Variability Within FODMAP Recommendations?**

Even well-known apps like MONASH and a variety of handouts will have variability in which foods are labeled as low, medium, or high FODMAP content. This can be highly confusing to patients and providers alike. MONASH, one of the best resources for RDs, works on a red, yellow, and green system and includes portion sizes to better understand quantity allowed on whichever type of restricted diet they’re using for their treatment.5

Keep in mind that the low FODMAP diet can be quite restrictive with very small portions of some foods. Catsos suggests considering overgeneralizing. She states, if you can’t have at least ½ cup of a given vegetable or fruit, she excludes it from her list. A Brussels sprout portion, for example, is only a serving size of ½ cup, not a full portion and could cause very low intake of a variety of foods—resulting in more work for the patient. She also suggests moving away from having clients actually count out the number of nuts they’re eating and move towards thinking about it as “a small handful” instead. She also suggests moving patients away from the micro florets vs the stalk, or exactly how ripe a given banana is, and looking at the bigger picture when it comes to low FODMAP diets. Less detailed and more general may be best for most patients on a short-term low FODMAP diet.

Aside from MONASH, there are other tools available. The website www.katescarlata.com has exact handouts, the Academy has some Nutrition Care Manual handouts, www.MyGlunutrition.com is another site from the University of Michigan, and Patsy Catsos also has books and a toolkit available for providers.5 She suggests that the low FODMAP diet is not a “perfect” diet (such as a gluten-free or peanut-free diet for those that need it). She states that we, as providers, need to look at the big picture—and help our clients look at the big picture, too. It’s a “low FODMAP” diet but not “no FODMAP” diet. There’s flexibility in this diet. Patients should not be going hungry or being overly restrictive.

Luckily there are now some certifications that indicate products are low FODMAP including “Monash University Low FODMAP Certified”4 and “FODMAP friendly approved food product” certified. This can make it easier for clients to identify safe products on the diet.

**Supplements for a Low FODMAP Diet and IBS**

One study of low FODMAP dietary plans plus probiotic VSL#3 found that, though there weren’t any additional benefits to subjective symptoms, the probiotic actually improved outcomes in potential changes to the microbiome including proportion from a potential decrease in diversity due to restrictions in the diet. Catsos stated that if someone is already on a probiotic, that in her practice, she allows people to stay on it during the elimination and reintroduction period of a FODMAP-restricted diet.6 Probiotics have not proven to be particularly effective for small intestinal bacterial overgrowth (SIBO) symptoms.

Peppermint oil can be effective in calming intestinal spasms in people with IBS and pain. It may positively impact visceral sensitivity and also act as an antimicrobial and anti-inflammatory.7

Fiber supplements should be soluble, viscous, minimally or slowly fermented and have a high water-holding/gel-forming capacity. Psyllium can be a good option as can partially hydrolyzed guar gum, acacia gum, or potato starch. Chia seeds are also low FODMAP and an excellent source of fiber. Make sure to start low (1/3 dose for a week) and increase slowly over time.

Multivitamins with no high FODMAP ingredients may be used to support a restricted diet and ensure adequacy of intake.

**SIBO**

Though there’s a lot of talk amongst our patient population regarding conventional treatment with a low FODMAP diet, Catsos recommends that the research on this subject currently is not strong enough to truly guide our practice. Keep in mind that SIBO is not actually an infection but rather normal bacteria that lives naturally in our intestines taking over in an abnormal way. The ileocecal valve sometimes fails in some way, allowing lower intestinal bacteria to migrate up to the small intestine. Risk factors include an ileocecal bowel resection, antibiotic use, or often, an unknown reason. A large amount of IBS patients do have SIBO—up to 37% of IBS patients in some studies.8,9

Biomarkers for SIBO do exist—elevated serum folate or vitamin K, B12- or iron-related anemia, fat malabsorption, elevated liver enzymes ALT and AST, and abnormal breath tests. Though breath tests are currently what practitioners use for diagnosis, keep in mind that this is an imperfect test and that there may be some level of variability.

Thank you, DIFM, for your support in attending this wonderful conference! I highly recommend anyone interested in learning more about gut health, IBS, FODMAPs, and SIBO attend a future conference by dietitian Patsy Catsos.

**References**

## DIFM Executive Committee & Leadership Team 2019-2020

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<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair*</td>
<td>Dana Elia, DCN-c, MS, RDN, LDN, FAND</td>
<td><a href="mailto:dana.eliardn@gmail.com">dana.eliardn@gmail.com</a></td>
</tr>
<tr>
<td>Chair-Elect*</td>
<td>Kory DeAngelo, MS, RDN</td>
<td><a href="mailto:kory.deangelo@gmail.com">kory.deangelo@gmail.com</a></td>
</tr>
<tr>
<td>Secretary*</td>
<td>Miho Hatanaka, RD</td>
<td><a href="mailto:mihohtnk@gmail.com">mihohtnk@gmail.com</a></td>
</tr>
<tr>
<td>Treasurer*</td>
<td>Ryan Whitcomb, MS, RD, CLT</td>
<td><a href="mailto:difmtreasurer@gmail.com">difmtreasurer@gmail.com</a></td>
</tr>
<tr>
<td>Past Chair*</td>
<td>Danielle Omar, MS, RDN</td>
<td><a href="mailto:2eatwell@gmail.com">2eatwell@gmail.com</a></td>
</tr>
<tr>
<td>DPG Delegate*</td>
<td>Mary Beth Augustine, RDN, CDN, FAND</td>
<td><a href="mailto:DelegateDIFM@gmail.com">DelegateDIFM@gmail.com</a></td>
</tr>
<tr>
<td>Nominating Committee Chair</td>
<td>Alicia Galvin, MEd, RD, LD, CLT</td>
<td><a href="mailto:agalvin09@gmail.com">agalvin09@gmail.com</a></td>
</tr>
</tbody>
</table>

*Indicates voting member

### Leadership Team

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecting Educators Chair</td>
<td>Aarti Batavia, MS, RDN, CLT, CFSP, IFMCP</td>
<td><a href="mailto:aartibatavia@gmail.com">aartibatavia@gmail.com</a></td>
</tr>
<tr>
<td>Diversity Co-Chair</td>
<td>Michelle Loy, MPH, MS, RDN</td>
<td><a href="mailto:michelle@gowellnessco.com">michelle@gowellnessco.com</a></td>
</tr>
<tr>
<td>Diversity Co-Chair</td>
<td>Fatima Bahary, RDN</td>
<td><a href="mailto:fatima.bahary@gowellnessco.com">fatima.bahary@gowellnessco.com</a></td>
</tr>
<tr>
<td>Diversity Associate</td>
<td>Denine Rogers, MS, RDN, LD, FAND,</td>
<td><a href="mailto:hepslivinghealthy@gmail.com">hepslivinghealthy@gmail.com</a></td>
</tr>
<tr>
<td>Planning Chair</td>
<td>Sarah Harding Laidlaw, MS, RDN, MPA, CDE, FNCE</td>
<td><a href="mailto:peaknutt70@gmail.com">peaknutt70@gmail.com</a></td>
</tr>
<tr>
<td>Marketing Chair</td>
<td>Christa Biegler, RDN, LN, CLT</td>
<td><a href="mailto:hello@christabiegler.com">hello@christabiegler.com</a></td>
</tr>
<tr>
<td>Membership Chair</td>
<td>Anita Davila, NDTR</td>
<td><a href="mailto:anitadavila2@gmail.com">anitadavila2@gmail.com</a></td>
</tr>
<tr>
<td>Mentoring And Coaching Chair</td>
<td>Olivia Neely, RDN, IFNCP</td>
<td><a href="mailto:olivia@letsgetrealdrd.com">olivia@letsgetrealdrd.com</a></td>
</tr>
<tr>
<td>Mind-Body Therapy Chair</td>
<td>Sandeep (Anu) Kaur, MS, RDN, RYT-500</td>
<td><a href="mailto:Anu@anuhealthyyou.com">Anu@anuhealthyyou.com</a></td>
</tr>
<tr>
<td>Network Chair</td>
<td>Kathie Madonna Swift, MS, RDN, LDN, FAND, EBQ, MBCP</td>
<td><a href="mailto:kathie@kathieswift.com">kathie@kathieswift.com</a></td>
</tr>
<tr>
<td>Newsletter Associate</td>
<td>Mary Purdy, MS, RDN</td>
<td><a href="mailto:MaryPurdyRD@gmail.com">MaryPurdyRD@gmail.com</a></td>
</tr>
<tr>
<td>Newsletter Editor</td>
<td>Jena Savadsky Griffith, RDN, IHC</td>
<td><a href="mailto:Jenas_mailbox@yahoo.com">Jenas_mailbox@yahoo.com</a></td>
</tr>
<tr>
<td>Copy Editor</td>
<td>Holly Van Poots, RDN, CSP, FAND</td>
<td><a href="mailto:hollypnpg@gmail.com">hollypnpg@gmail.com</a></td>
</tr>
<tr>
<td>Newsletter Editor/Botanicals</td>
<td>Dina Ranade, RDN, LD</td>
<td><a href="mailto:dranade@comcast.net">dranade@comcast.net</a></td>
</tr>
<tr>
<td>Associate Newsletter Editor/News You Can Use</td>
<td>Geanna Revell, MS, RDN</td>
<td><a href="mailto:geanna.revell@gmail.com">geanna.revell@gmail.com</a></td>
</tr>
<tr>
<td>Newsletter Editor/Mind Body</td>
<td>Chrissy Barth, MS, RDN, RYT</td>
<td><a href="mailto:chrissy@nutritionlifestyleeducation.com">chrissy@nutritionlifestyleeducation.com</a></td>
</tr>
<tr>
<td>Newsletter CPE Editor</td>
<td>Staci Belcher, MS, RDN, LDN</td>
<td><a href="mailto:stacibelcher5@gmail.com">stacibelcher5@gmail.com</a></td>
</tr>
<tr>
<td>Newsletter Co-Editor Biochemistry/ Nutritional Genomics</td>
<td>Olivia Dong, MPH, RDN, LDN</td>
<td><a href="mailto:odong@email.unc.edu">odong@email.unc.edu</a></td>
</tr>
<tr>
<td>Policy Advocacy Leader</td>
<td>Lisa Shkoda, RDN, CSP, CNSC, FAND</td>
<td><a href="mailto:lisa.shkoda@gmail.com">lisa.shkoda@gmail.com</a></td>
</tr>
<tr>
<td>Nominating Chair-Elect</td>
<td>Teryn Cook Buchanan, RD</td>
<td><a href="mailto:terynccbuchanan@gmail.com">terynccbuchanan@gmail.com</a></td>
</tr>
<tr>
<td>Professional Advancement Chair</td>
<td>Therese Berry, MS, RDN, LD, CNSC</td>
<td><a href="mailto:therese.austin@coramhc.com">therese.austin@coramhc.com</a></td>
</tr>
<tr>
<td>Professional Advancement Associate</td>
<td>Elisabeth Daniels, MS, RDN, CD</td>
<td><a href="mailto:e.joy.daniels@gmail.com">e.joy.daniels@gmail.com</a></td>
</tr>
<tr>
<td>Research Chair</td>
<td>Stephanie Harris, PhD, MS, RDN, LD</td>
<td><a href="mailto:stephanie.harris@case.edu">stephanie.harris@case.edu</a></td>
</tr>
<tr>
<td>Social Media Chair</td>
<td>Melissa Groves, RDN</td>
<td><a href="mailto:contact@avocadogrovenutrition.com">contact@avocadogrovenutrition.com</a></td>
</tr>
<tr>
<td>Social Media Associate</td>
<td>Tamara Luck</td>
<td><a href="mailto:tamaraluckrdn@gmail.com">tamaraluckrdn@gmail.com</a></td>
</tr>
<tr>
<td>Sponsorship Chair</td>
<td>Bridgitte Carroll, MS, RDN, LDN</td>
<td><a href="mailto:bridgitte.difm@gmail.com">bridgitte.difm@gmail.com</a></td>
</tr>
<tr>
<td>Sponsorship Associate</td>
<td>Abby Hueber, RDN, RYT</td>
<td><a href="mailto:abhueber@gmail.com">abhueber@gmail.com</a></td>
</tr>
<tr>
<td>State Coordinator, CA</td>
<td>Danica Cowan, MS, RD</td>
<td><a href="mailto:danica@fulcruumnutrition.com">danica@fulcruumnutrition.com</a></td>
</tr>
<tr>
<td>State Coordinator, CA</td>
<td>Sangeeta Shrivastava, PhD, MS, RDN</td>
<td><a href="mailto:a.sangeeta.aa@gmail.com">a.sangeeta.aa@gmail.com</a></td>
</tr>
<tr>
<td>State Coordinator, FL</td>
<td>Marilyn Gordon, EdD, RDN, CSSD, LDN</td>
<td><a href="mailto:gordmari@nova.edu">gordmari@nova.edu</a></td>
</tr>
<tr>
<td>Student Membership Co-Chair</td>
<td>Catherine Brown</td>
<td><a href="mailto:catherineebrown@hotmail.com">catherineebrown@hotmail.com</a></td>
</tr>
<tr>
<td>Student Membership Co-Chair</td>
<td>Sarah Elster</td>
<td><a href="mailto:Sarah.a.elster@gmail.com">Sarah.a.elster@gmail.com</a></td>
</tr>
<tr>
<td>Executive Administrator/Website Mgr/EML Coordinator</td>
<td>Amy Jarck</td>
<td><a href="mailto:info@integrativeRD.org">info@integrativeRD.org</a></td>
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