Autism Spectrum Disorders: Nutritional Strategies and Interventions

Autism is a developmental disorder characterized by impaired social interaction, deficits in verbal and nonverbal communication, stereotypical behaviors and unusual or severely limited activities and interests, with the degree of severity and symptoms expressed in each individual being highly variable. As a result, a range of diagnoses exist under the umbrella of Autism Spectrum Disorder (ASD), which includes Autism, Asperger’s and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). The incidence of ASDs in the United States continues to skyrocket and is currently estimated to be 1 in 88 American children (and 1 in 54 boys). The lifetime per capita societal cost of this disorder is 3.2 million dollars, and this does not even begin to quantify the emotional and physical toll that ASD takes on these individuals and their families.

While the etiology and biological basis of autism has still not been identified, current evidence points to a combination of genetic predisposition combined with environmental triggers. Although the majority of research dollars are directed at identifying genetic markers of autism, emerging data has identified the existence of co-morbid medical conditions such as alterations in the gastrointestinal, immune, detoxification, redox regulation and energy generating systems in children on the spectrum. Whether these abnormalities are causative or a consequence of autism remains to be elucidated, but in each case therapeutic nutrition interventions can play a critical role.

Gastrointestinal Health

Autism has been called a gut disorder by some, and parents commonly report that their children with ASDs experience gastrointestinal (GI) problems at a greater rate than unaffected siblings. The most common presentations include chronic abdominal pain, constipation and/or diarrhea, and symptoms of gastro-esophageal reflux. The incidence of digestive disorders may well be underreported since nonverbal children are not easily able to communicate pain. Self-injurious behaviors such as head banging and the application of pressure on the abdomen are nonverbal cues that discomfort is present. Sleep disturbance has also been reported at a higher rate in autistic children with GI distress.

Many pediatricians have considered the digestive component as simply a “part of autism” and have not treated the underlying gastrointestinal abnormalities. In 2010, the journal Pediatrics published a supplemental article entitled “Recommendations for Evaluation and Treatment of Common Gastrointestinal Problems in Children with ASDs”. The position of the panel of gastroenterologists who authored the article was that children with ASDs should be evaluated for GI disorders as thoroughly as non-ASD children.
who present with the same symptoms. In addition, the panel stated that “Pediatricians and other primary care providers [should] be alert to potential nutritional problems in patients with ASDs. Evaluation by a nutritionist who is familiar with nutrition support for individuals with ASDs is recommended if caregivers raise concern about the patient’s diet or if the patient exhibits selectivity of intake or is on a restricted diet.” Nutritional deficiencies have been identified in patients with ASDs, which may be a result of self-limited food choices, malabsorption, and/or restricted diets. The panel also recommended that a detailed history be taken to identify potential associations between food allergens and gastrointestinal problems and called for further research into the existence of intestinal permeability and the effectiveness of gluten and casein free diets. Parents report that a gluten-free and casein-free diet (GFCF) positively affects children with ASDs, and recent research by Pennesi supports their observations. There are multiple theories as to why GFCF improves autistic symptoms, and it is possible that more than one is correct. Children with ASDs who present with gastrointestinal disorders may suffer from intestinal permeability and imbalances in the microbiota. This can result in malabsorption of key nutrients, exacerbate food sensitivities and inflammation, and increase absorption of toxins through the intestinal lumen, thereby increasing oxidative stress. Gluten and casein are common allergens which may influence or aggravate these conditions and are also posited to allow opioid peptides to cross the blood-brain barrier. Other dietary interventions, such as low phenol diets, the Specific Carbohydrate Diet, low oxalate diets, and allergy avoidance diets have been utilized with children on the spectrum. A lack of adequate evidence-based data concerning these diets does not allow for a determination of their efficacy in autism. As advised by the expert panel, however, when children with ASDs present with gastrointestinal symptoms consistent with a disorder addressed by one of the diets above, appropriate nutritional intervention is warranted. Finally, epilepsy presents more commonly in children on the spectrum, and in these cases, a low-carbohydrate or Modified Atkins Diet for Epilepsy (MADE) may be indicated. Probiotics are a tool which may help address the underlying gut imbalances in ASD, since they are essential for normal digestive health. They have been used effectively for many gastrointestinal disorders, and a wide variety of health issues respond to probiotic therapy. Probiotics can influence the host’s immune system, impacting not only mucosal immunity, but overall immune function as well. Alterations in immune balance are additional areas of dysfunction commonly seen in children with ASDs.

Immune Function

Data from the Medical Investigation of Neurodevelopmental Disorders (MIND) Institute at University of California, Davis, indicate that more than 70 percent of children with ASDs have altered immune function. It has been almost a decade since Vargas observed neuroinflammation in the autopsied brain tissue of autistic subjects, characterized by neuroglial activation and increased cytokine production. Neuroglial cells include microglia and astroglia and are the primary cells which support and protect neurons. Increases in microglia are associated with innate immune response and are the main cellular response to dysfunction in the Central Nervous System (CNS). Similar proinflammatory processes were identified in the cerebrospinal fluid of living subjects. More recent studies have identified significantly greater microglial densities around neurons of autistic subjects vs. controls. The role of microglia in autism is unclear, but since they are key players in the immunoprotection of brain cells, anomalies in microglia may indicate underlying immune abnormalities which ultimately affect the brain. Other evidence of immune derangement in ASD includes increased frequency of otitis media, food allergies and Th1/Th2 imbalances. Omega-3 fatty acids are frequently used in the ASD population, and while good quality studies are lacking, there is some evidence that these essential fatty acids (EFAs) can improve symptoms. In one study by Amminger, omega-3 fatty acids showed an advantage over placebo for reducing hyperactivity and stereotypy. While the method of action is not clear,
Mitochondrial dysfunction (see Figure 1 for mitochondrial intermediaries).”16 Supplementation with levo-carnitine significantly improved several clinical measurements of autism.17

Cerebral Folate Deficiency
Folic acid is an essential nutrient for numerous biochemical reactions in the body. The active form of folate is 5-methyltetrahydrofolate (5-MTHF) and requires both niacin and vitamin B12 for proper conversion and recycling. Folate is important for de novo synthesis of purine and pyrimidine nucleic acids and is critical during fetal development. It is also a necessary component of the methionine cycle, which affects methylation, and as such, impacts gene expression. Transport of active 5-MTHF across the blood-brain barrier requires the folate receptor FR1, while a secondary pathway utilizes the reduced folate carrier (RFC), which has a greater affinity for folinic acid. Cerebral folate deficiency (CFD) syndrome was first described by Ramaekers18 and is a neurodevelopmental disorder usually caused by folate receptor autoantibodies (FRAs) that interfere with folate transport across the blood–brain barrier. In one study of 93 children diagnosed with ASDs, 75.3% had high serum concentrations of FRAs.19 In 16 of the subjects, the concentration of FRAs was significantly correlated with low 5-MTHF levels in cerebrospinal fluid. Common symptoms of ASD were significantly decreased when CFD was treated with folinic acid—when the children with high FRA levels were treated with folinic acid supplementation (oral leucovorin calcium) there were significant improvements in verbal communication, receptive and expressive language, attention, and stereotypy. Mitochondrial disease has been associated with CFD. Of note, human folate receptors have been shown to cross-react with the folate receptors found in human, cow and goat milk, which may potentiate folate antibody production. When Ramaekers20 trialed a milk-free diet on his subjects, FR1 antibodies were significantly decreased; they became elevated again upon reintroduction of dairy. This provides further support for the use of a dairy-free diet in a subset of children with ASDs.

Vitamin D
The hypothesis that low vitamin D levels during fetal development and early childhood are a causative factor in ASD remains speculative at this time, but the importance of vitamin D should not be overlooked. Chronic vitamin D deficiency is pervasive in the United States in both adults and children. Evidence of a relationship between vitamin D and autism includes greater prevalence of autism in areas with greater rainfall and cloud cover, in children born in the spring, and in northern latitudes. Low serum 25(OH)D levels in children with ASD, increased risk of autism in those with darker skin, and increased risk of autism in premature infants have also been observed.21 Clinical trials are underway exploring the impact of vitamin D supplementation during pregnancy on autism rates, but no results are available as of yet.

Take Home Message
In summary, current research indicates that nutrition therapy for ASD can and should be targeted at the underlying nutritional and biochemical abnormalities that affect digestion, immune function, oxidative stress, mitochondrial dysfunction and folate metabolism. It is still not well understood whether these physical and physiological alterations are causal or correlated, but this should not preclude the RD from using the tools in the nutrition arsenal to ameliorate them. Foundational interventions to consider when working with a child on the Autistic Spectrum include: 1) a “clean” diet, free of the chemicals, pesticides, artificial additives, hormones and antibiotics that may tax poorly functioning detoxification pathways, 2) a diet low in refined and processed foods, low in sugar, and nutrient-dense to reduce inflammation and provide antioxidant support, 3) adequate protein for production of glutathione precursors, 4) removal of inflammatory food allergens that may impair gut function, 5) a trial of a gluten-free and casein-free diet, 6) support with high quality probiotics and essential fatty acids to reduce inflammation and optimize intestinal integrity, 7) vitamin D supplementation when clinically indicated, 8) mitochondrial support or folinic acid supplementation when warranted by evidence of mitochondrial dysfunction or CFD, 9) other specialized diets when indicated.
References


For more articles and information on autism, watch for future emails from DIFM announcing the winter and spring issues as well as other learning opportunities. DIFM will be featuring articles and information from Geri Brewster, RD, MPH, CDN, a nationally recognized authority on childhood disorders and autism.
Instructions for Completing the CPE Activity for Credit

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1. Which of the following describes the rate of GI problems in children with Autism Spectrum Disorder (ASD) compared to non-ASD children, as reported by their parents?
   a. About the same
   b. Less frequent
   c. More frequent

2. Which of the following are some of the most common GI problems observed in children with ASD?
   a. Vomiting, nausea and diarrhea
   b. Stomach ulcers, constipation and bloating
   c. Abdominal pain, constipation and heartburn

3. Which nutritional interventions have demonstrated positive results in autistic children?
   a. Increasing gluten and casein products in the diet
   b. Eliminating gluten and casein products from the diet
   c. Increasing monounsaturated fats & soy products in the diet
   d. Eliminating monounsaturated fats & soy products from the diet

4. Which of the following is considered evidence of immune derangement in ASD?
   a. Abnormal neuroglial activation
   b. Normal levels of Th1/Th2 in resting state
   c. Elevated levels of interleukin 10

5. Which of the following is an area of potential overlap between ASD and mitochondrial disorder?
   a. Subnormal C-reactive protein levels
   b. Above normal levels of total carnitine
   c. Increased oxidative stress
   d. Decreased levels of alanine

6. Which of the following is a potential role that cerebral folate deficiency (CFD) may play in ASD?
   a. Association with increased otitis media
   b. Association with pro-inflammatory markers
   c. Association with mitochondrial disease

7. Which of the following describes evidence of a potential relationship between Vitamin D and ASD?
   a. Greater prevalence of ASD in areas with more rainfall and cloud cover
   b. Greater prevalence of ASD in children born in the winter months in the U.S.
   c. Greater prevalence of ASD in areas south of the equator

8. Which of the following nutritional interventions should be considered when working with children with ASD?
   a. Limiting fiber and protein rich foods
   b. Including organic and whole or minimally-processed foods
   c. Limiting pre- and probiotic foods


CPE Reporting Form • Fall 2012 • Autism Spectrum Disorders. Expiration Date September 30, 2013

Please print or type

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The Ketogenic Diet’s Past, Present and Potential

Special diets may be considered therapeutic for certain medical conditions, genetic disorders, or other health concerns. The Ketogenic Diet (KD), for example, has been used since the 1920s as a dietary treatment for the control of epileptic seizures in children. Recent research and case studies suggest potential for the KD as integrative therapy for the treatment of obesity, cardiovascular disease, type 2 diabetes, and certain types of cancer and neurological disorders. This article provides a brief review of epilepsy and the use of the KD for its treatment, followed by an introduction of the available literature on the use of KD in other applications.

Epilepsy and the Ketogenic Diet

There are approximately 2.5 million individuals in the United States with epilepsy, and of these individuals, 25-30% have Intractable Epilepsy (IE). Epilepsy is a neurological condition, which affects the central nervous system and is also known as seizure disorder. In epilepsy, the brain’s electrical rhythms have a tendency to become imbalanced, resulting in recurrent seizures. It is usually diagnosed after a person has had at least two seizures that were not caused by some known medical condition like alcohol withdrawal or extremely low blood sugar. The seizures in epilepsy may be related to a brain injury or a family tendency, but most of the time the cause is unknown. Intractable epilepsy is considered to be intractable because of the difficulty involved with manipulating or altering the disease. It is characterized by inadequate control of seizures despite optimal treatment with standardized medications. IE is associated with a number of negative consequences, including early mortality and cognitive impairments.

Pharmaceuticals are not always effective in controlling seizures and may result in negative side effects. An alternative and often efficacious method for controlling seizure occurrence is the KD, which requires that the individual consume a very high quantity of fat, moderate amounts of protein, and limited amounts of carbohydrates. Depending on individual results, the ratio of the diet can be changed to allow for less fat and more protein and carbohydrates.

The KD diet is effective because it mimics the characteristics of starvation by forcing the body to use fat for fuel rather than carbohydrates. In an unrestricted diet, carbohydrates are converted into glucose and used as energy. A particularly important function of glucose is fueling brain function. With the KD diet, there are very little carbohydrates in the diet, so the liver therefore converts the fat in the diet to fatty acids and ketone bodies. These ketone bodies replace glucose and act as the energy source for the brain. It has been found that an elevated level of ketone bodies in the blood, which is known as ketosis, has led to a reduction in frequency of epileptic seizures.

There are different distribution ratios of the KD diet that may be appropriate for intractable epilepsy patients based on their response to the treatment. These energy distribution diets can be classified as classic keto, liberal keto, MCT keto, and regular diets. The different distribution ratios can be seen in Table 2.

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<th>Energy Distribution</th>
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<th>Liberal Keto</th>
<th>MCT Keto</th>
<th>Regular Diet</th>
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<td>Ratio (fat-nonfat)</td>
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<td>3:1</td>
<td>2:1</td>
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<td>Fat (kcal)</td>
<td>90%</td>
<td>87%</td>
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<td>10%</td>
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<td>18%</td>
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The types of seizures that can be treated by the KD are those that are disorders of brain energy metabolism. The first is a GLUT1 deficiency syndrome, where glucose transport across the blood-brain barrier is impaired, resulting in seizures, developmental delay, and a movement disorder. The second brain energy metabolism disorder is pyruvate dehydrogenase deficiency (PDHD). In this disorder, pyruvate cannot be metabolized into acetyl-CoA. For both disorders, the KD diet provides ketones that are able to bypass these defects and serve as an alternative fuel for the brain.

The Ketogenic Diet in Practice

The KD diet is based on the aforementioned high-fat, low-carbohydrate, moderate protein regimen. In the more traditional variations, foods must be carefully measured and menus must be accurately calculated to achieve the appropriate ratios. Generally, recommended high fat sources include butter, mayonnaise, margarine, cream, cheese, cream cheese, nuts and nut butters, and corn, canola, flaxseed, olive, and peanut oils.
Protein sources may include chicken, beef, pork, fish or other lean meats. Low or non-carbohydrate foods to add to the KD shopping list include cocoa, sugar-free jelly, sweeteners, mixed herbs and garlic powder, and water or diet drinks. High carbohydrate foods such as fruits and fruit juices, breads, pasta, rice, cereals, milk, and soda must be excluded. Additionally, high carbohydrate vegetables such as corn, peas, potatoes and beans, as well as snacks such as chips, snack cakes, crackers and sweets must be avoided.

With the help of recipes such as those in Ketogenic Diets: Treatment for Epilepsy and Other Disorders by Kossoff et al., a sample Ketogenic Diet Menu might look like the following:

**Breakfast:**  Western Omelet with Peppers, Onions, and Tomatoes

**Snack:**  Celery and Peanut Butter (with no sugar added)

**Lunch:**  Chef’s Salad with Oil and Vinegar Dressing

**Treat:**  Butter Lollipop

**Dinner:**  Beef Stew

Though the KD diet has proven to have a number of positive associations for individuals suffering from IE, it is important to consider its potential adverse effects. The diet can be perceived as too rigid, unpalatable, too difficult to maintain, and not effective enough for the effort that is required. Adverse effects of the diet are observed both during initiation and during maintenance of the diet. During initiation, patients may experience dehydration, hypoglycemia, and vomiting. During the maintenance phase of the diet, patients may experience poor growth, kidney stones, dyslipidemia and hyperlipidemia, irregularities in heart rate and function, excessive bruising, optic neuropathy, Vitamin D deficiency/osteomalacia, trace mineral deficiencies, constipation, and exacerbation of gastroesophageal reflux disease. Individuals who eat according to the KD diet should supplement with Vitamin D in an effort to prevent bone loss. Additionally, the practitioner and patient or caregiver should discuss signs and symptoms and utilize blood tests and urine samples to monitor for the above side effects or the presence of ketones.

Though there are negative connotations associated with the KD that may keep physicians and parents from utilizing the diet, there are still positive opinions associated with the diet. Many believe that because the therapy is diet based, it is more ‘natural’ than any drug therapy or surgery and it is a more desired treatment option. In terms of long-term complications, no cases have been reported with more than two years of treatment, so although the immediate complications exist, the risk of associated complications decreases as patients are able to advance to different stages of the diet.

**Other Applications for the Ketogenic Diet**

Researchers continue to explore the applications of the KD and its variations in not only controlling epileptic seizures, but also in treating other conditions. The KD and/or other low carbohydrate diets show potential health benefits in the treatment and/or prevention of obesity, cardiovascular disease, type 2 diabetes, and certain types of cancer. Other limited research suggests that the KD may be therapeutic for conditions such as Parkinson’s disease, Alzheimer’s disease, migraine headaches, narcolepsy, autism and depression. A limited number of randomized control trials comparing the effects of low carbohydrate/high protein (LC/HP) diets that result in ketosis to those of low fat/low calorie (LF/LC) suggest that LC/HP diets result in greater weight loss and improved cholesterol profiles. Results from a two-year trial conducted by Shai et al. suggest that these benefits of a LC/HP diet may potentially be long-term.

Additionally, a low-carbohydrate KD, when compared to a low-fat diet, resulted in greater improvements in ratings of hunger and negative affect. The category of negative affect included the following complaints: depressed, fearful, cannot decide easily, cannot concentrate, poor memory, worry frequently, feel insecure, highly emotional, moody, cry easily, fits of anger, magnify insignificant details, cannot work well under pressure. Additional trials suggest that low carbohydrate diets may be effective in controlling type 2 diabetes. In a trial by Dashti et al., a low carbohydrate diet was shown to reduce body weight, body mass index, total cholesterol, triglycerides, LDL-cholesterol and glucose, and increase HDL cholesterol after one year. In a separate trial by Westman et al., participants following a low-carbohydrate KD benefitted from improvements in hemoglobin A1C, fasting glucose, fasting insulin, and weight reduction after 6 months. With adherence to a restriction of <20 g of carbohydrates/day, 95.2% of the participants in this randomized control trial were able to reduce or eliminate medications. Preliminary research on the efficacy of a KD in treating neoplasms of the brain is not definitive, yet holds promise. The KD concomitantly decreases the circulating glucose upon which tumors rely for rapid growth and increases ketone bodies that may offer neuroprotective benefits. Conflicting results among trials studying the effectiveness of a KD suggest that the diet should be used among other therapies in cancer treatment. A pilot study by Evangelou et al. examined the effect of six months of the KD on 30 children with autistic behavior. The diet was given in four-week periods, each followed by two-week diet-free intervals. Sixty percent of the 30 patients who completed the study showed improvements in social behavior and interactions, speech, cooperation, stereotypy and hyperactivity, with significant improvements in two of the patients. Interestingly, the benefits of the KD continued through the diet-free intervals. Because many children who have autism are also diagnosed with epilepsy, the KD may be an appropriate integrative therapy for some children with one or both disorders.

**Take Home Message**

The mechanism and effectiveness of the KD for various conditions remains to be elucidated and is complicated by genetics, diet adherence and other factors. However, a nearly decade-long history, continued research, reviews and case studies suggest multiple potential opportunities for applying the KD or its low-carbohydrate variations as therapy. As with any integrative therapy, it is important to weigh the physiological and psychological benefits and risks of the diets. Dietitians who practice integrative and functional medical nutrition therapy have the background and the resources to achieve a thorough understanding of the ketogenic diet and its applications.
References


Introduction

The singular term “dietary fiber” gives the notion of a single nutrient. However, the plural, “dietary fibers,” more accurately describes the collection of individual fibers we consume, from wheat to oats, barley, beans, bananas and more. Research on some dietary fibers, when fermented, strongly supports their benefits for specific health conditions beyond those seen with non- or minimally-fermented fibers. Resistant starch (RS) is a fermentable dietary fiber with several health benefits, particularly in weight control and glycemic health. These benefits are especially important today because many Americans are overweight, have insulin resistance, and/or prediabetes or type 2 diabetes. Incorporating RS into clients’ eating plans is one more strategy clinicians can utilize to help consumers increase total dietary fiber intake.

Fiber Consumption Remains at Steady State

Evidence demonstrates that dietary fibers can reduce the risk of cardiovascular disease, obesity, prediabetes, and type 2 diabetes. However, despite a decade of guidance to increase dietary fiber, less than 4% of Americans ages 4 to 50 meet the current recommendation of 21–38 g/day (Daily Value is 25 g/day). Americans’ fiber intake has stagnated. Mean daily fiber intakes for adults over 18 from the National Health and Nutrition Examination Survey (NHANES) was 15.6 g/day. In 2007-2008 it was 15.9 g/day. Americans are in need of clear and concise messages about how to achieve adequate intake of a variety of dietary fibers. To do so, they need availability of foods with added dietary fibers that have proven health benefits to prevent or manage today’s dominant health concerns.

Resistant Starch Basics

Most starches are digested and absorbed through the small intestine, but RS resists digestion here. Instead, it is slowly fermented in the large intestine where it acts like dietary fiber and is considered a prebiotic fiber. RS is present in some carbohydrate containing foods and is relatively high in beans and legumes, just-ripe bananas and intact whole grains. Table 1 provides the RS in a sampling of foods. Americans consume approximately 5 g/day of dietary fiber from RS. Though there is no government-based recommended RS intake, experts suggest 15–20 g/day. RS can be consumed in large amounts (at least 45 g/day) with minimal to no digestive side effects due to its slow fermentation along the large intestine. Natural RS is available as an ingredient—

Hi-maize® resistant starch. It is a fine, white starch with a small particle size produced from a naturally bred hybrid of non-GM high-amylose corn. It contains 40% starch slowly digested in the lower small intestine and 60% RS slowly fermented in the large intestine. Hi-maize is currently added by food manufacturers to breads, pastas, bakery mixes, pizza crusts, snacks, and ready-to-eat cereals. It easily replaces flour without negatively impacting the texture or taste of foods. Hi-maize contains 2-3 calories/gram vs. the usual 4 calories/gram from carbohydrates. When it replaces flour, the calorie content of that food is reduced. Hi-maize can also be purchased by consumers to incorporate into foods prepared at home (see below).

RS and Hi-maize Health Benefits

Hundreds of animal and human studies have been published revealing health benefits of RS, largely stemming from the short chain fatty acids (SCFAs) produced through the fermentation of RS. The
Table 1: Resistant Starch Content of Commonly Consumed Foods*5

<table>
<thead>
<tr>
<th>Food</th>
<th>Serving/Amount</th>
<th>Resistant Starch (g/serving)*5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banana, slightly green</td>
<td>1 medium, peeled</td>
<td>4.7</td>
</tr>
<tr>
<td>Hi-maize* resistant starch</td>
<td>1 Tbsp (approx 9.5 g in weight)*5 (13 calories)</td>
<td>4.5</td>
</tr>
<tr>
<td>Oats, rolled</td>
<td>¼ cup, uncooked</td>
<td>4.4</td>
</tr>
<tr>
<td>White Beans</td>
<td>½ cup, prepared</td>
<td>3.7</td>
</tr>
<tr>
<td>Lentils</td>
<td>½ cup, cooked</td>
<td>3.4</td>
</tr>
<tr>
<td>Pizza</td>
<td>1 slice, 1/8th of a 14&quot; pizza (~100 g)</td>
<td>2.8</td>
</tr>
<tr>
<td>Aunt Millie's Whole Grain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Bread</td>
<td>Two slices (45 g)</td>
<td>2.5</td>
</tr>
<tr>
<td>Yams</td>
<td>½ cup, cooked</td>
<td>2.5</td>
</tr>
<tr>
<td>Chickpeas</td>
<td>½ cup, prepared</td>
<td>2.0</td>
</tr>
<tr>
<td>Peas, green</td>
<td>½ cup, prepared</td>
<td>2.0</td>
</tr>
<tr>
<td>Barley, pear</td>
<td>½ cup, cooked</td>
<td>1.9</td>
</tr>
<tr>
<td>Rice, brown</td>
<td>½ cup, cooked</td>
<td>1.6</td>
</tr>
<tr>
<td>Kidney Beans</td>
<td>½ cup, prepared</td>
<td>1.4</td>
</tr>
<tr>
<td>Pasta (cooked or cooled, white or whole wheat)</td>
<td>1 cup, cooked</td>
<td>1.2 (average)</td>
</tr>
<tr>
<td>Pumpernickle bread</td>
<td>1 slice</td>
<td>1.1</td>
</tr>
<tr>
<td>Rice, white</td>
<td>½ cup, cooked</td>
<td>1.1</td>
</tr>
<tr>
<td>Quinoa**</td>
<td>½ cup, cooked</td>
<td>1.0</td>
</tr>
<tr>
<td>Corn Flakes</td>
<td>1 cup</td>
<td>0.9</td>
</tr>
<tr>
<td>Potato</td>
<td>½ cup, cooked/mashed</td>
<td>0.6-0.8</td>
</tr>
<tr>
<td>Oats, cooked</td>
<td>1 cup, cooked</td>
<td>0.5</td>
</tr>
</tbody>
</table>

*To obtain the weight of Hi-maize in a tablespoon, 20 samples of Hi-maize were collected by scooping a tablespoon out of a container of Hi-maize resistant starch, leveling it with a spatula and weighing it. The average weight of the samples was 9.52 g.

**Unpublished data, measured by the modified Englyst method performed by Ingredion and Englyst Carbohydrates, South Hampton, England, 2010.

SCFAs are used as energy within the large intestine (particularly butyrate) or are absorbed into the circulation to provide several health benefits. Research shows that these SCFAs trigger increases in the production of hormones known to be involved in insulin sensitivity, satiety and lipid metabolism.11,12 Even though RS occurs naturally in foods, the majority of RS research has been conducted with Hi-maize. Researchers use Hi-maize because it retains a consistent content of RS and is easily integrated into foods, which can assure adequate intake by animals and humans. Large amounts can be used to explore its physiologic impacts and potential gastrointestinal effects.

Benefits in Weight Control: A sampling of human studies detailed below show increased satiety, decreased hunger and lower calorie intake at that meal, as well as the next, and up to 24 hours later.

- A randomized crossover study from Slavin’s group, University of Minnesota, fed 20 healthy adults after an overnight fast five muffins with four different test fibers, such as beta glucan, oat fiber and RS.13 Each test muffin contained approximately 9 g of fiber. The muffin containing RS provided the greatest effect on subjective satiety over the few hours after consumption.
  - A study from Anderson’s team, University of Toronto, in a randomized crossover trial, fed 17 healthy men Hi-maize RS in tomato soup two hours before lunch.14 Subjects were provided with a buffet lunch and could eat as desired. Fewer calories (116 kcals) were consumed at lunch when the soup contained RS (116 kcals less cumulatively vs. the maltodextrin). Subjects also reported greater satiety using a validated appetite measurement.
  - In a randomized crossover study by Robertson’s group, University of Surrey (UK), 20 healthy males were fed 48 g of RS as Hi-maize divided equally at breakfast and lunch or placebo equivalent starch.15 When subjects consumed RS, they consumed 6.6% fewer calories at dinner and 10% fewer calories over 24 hours, while reporting no difference in feelings of hunger or fullness.

Table 2 summarizes these studies.

Benefits in Glycemic Control: Human studies demonstrate a slower and lower glycemic effect post food consumption,16 lower post meal plasma insulin15 and improvements in insulin sensitivity.17-21 Robertson’s study demonstrated a significant reduction in postprandial insulin response after breakfast and lunch when RS was consumed compared to the placebo equivalent starch.15 Six out of seven studies conducted in various populations have shown beneficial effects on insulin sensitivity in studies where 15 g/day or more RS was consumed.15,17-21 The study in African American adults at risk for type 2 diabetes showed no effect, but used only 7 grams RS/day.22 The study by Maki included 30 overweight males and females.17 In this randomized double-blind crossover study, the free-living overweight subjects were fed either 15 or 30 g RS/day for 4 weeks. Men consuming 15 g/day experienced a 56% improvement in insulin sensitivity and with 30 g/day RS they experienced a 73% improvement. No significant effect was seen in women. Further research will elucidate the effect of RS in women. Table 3 summarizes these studies.

Animal studies suggest that the glycemic and weight benefits from Hi-maize may be generated from two mechanisms. Hi-maize’s slowly digested portion appears to shift hormonal responses within the small intestine while the fermentation of RS triggers an increase in several hormones known to be involved in hunger and satiety in the large intestine.23,24 Additional research is needed to confirm if these pathways are similar in humans and are responsible for the glycemic and weight benefits.

Resistant Starch on the Food Label
The RS in Hi-maize, when added to foods by manufacturers, tests and is counted as fiber for the Nutrition Facts panel,
according to accepted analytic methods. It is labeled as dietary fiber in the ingredients and can be listed in several ways, from the least specific “corn starch” (however, it is not ordinary corn starch) to “resistant corn starch.” It remains challenging to determine the RS in foods because it is not available in commonly used nutrient databases. The most complete database of RS in commonly consumed foods was published in 2008.¹

**Help Consumers Consume More Resistant Starch**

Effort is required to increase RS intake to 15–20 g/day, however, consider any additional RS intake beneficial and a contribution to total dietary fiber. Encourage consumers to take three actions:

1) Substitute foods low in RS for those with more RS (see Table 1).³ For example, eat a just-ripe banana instead of an apple, enjoy bean soup rather than broth-based soup.

2) Consume foods that contain Hi-maize (http://www.hi-maize.com/HiMaize/USA/Consumers/Where+can+I+find+Hi-maize/)³

3) Purchase and add at least one tablespoon of Hi-maize per day to regularly consumed foods, such as oatmeal, oat bran, yogurt, a smoothie, or replace up to 25% of the flour in recipes containing flour. (Hi-maize may be purchased from King Arthur Flour http://www.kingarthurflour.com/shop/items/hi-maize-fiber-12-oz).

**Take Home Message**

Americans should be encouraged to consume higher intakes of dietary fibers because of their numerous and varied health benefits. However, average consumption remains well below the current recommendation of 21-38g/day. RS is a dietary fiber naturally found in some carbohydrate-rich foods and in the ingredient Hi-maize. RS resists digestion in the small intestine and is slowly fermented in the large intestine, which gives rise to beneficial bacteria and SCFAs. Two key health benefits of Hi-maize RS are related to weight control and glycemic health. Nutrition professionals should encourage consumers to increase RS intake in three ways: consume more foods containing RS, integrate foods containing Hi-maize and add Hi-maize to foods commonly consumed.

* Hi-maize resistant starch is a registered trademark of Ingredion Incorporated.

**References:**

1. U.S Department of Agriculture, Center for Nutrition Policy and Promotion. Report of the Dietary Guidelines Advisory Committee on...


This article was generously sponsored by Ingedion, Inc., manufacturers of Hi-maize (R) resistant starch (www.hi-maize.com and www.resistantstarch.com).
Ketogenic Diets: Treatments for Epilepsy and Other Disorders. 5th Edition.
Eric H. Kossoff, John M. Freeman, Zahava Turner & James E. Rubenstein
Softcover. $29.95
ISBN: 978-1-936303-10-6

Coauthored by four clinicians from Johns Hopkins—where the ketogenic diet (KD) was first developed as a treatment for epilepsy—this book is an extremely thorough and instructive guide to understanding and implementing the KD. Unique in that it is written for both professionals and parents, *Ketogenic Diets: Treatments for Epilepsy and Other Disorders* truly encompasses it all.

Section I, *Overview of the Traditional Ketogenic Diet*, relates background information regarding the KD as a treatment for epilepsy in children, possible mechanisms of the diet (the exact reason for its effectiveness remain unknown), and provides insight into the decision-making process regarding whether or not to implement the diet. Before starting the KD, it is helpful to define what would be considered success: complete cessation of seizures? A 50% reduction? Consider the time and planning required for the KD, versus the side effects of medications. Many patients are on multiple medications, which may be reduced or eliminated if he or she responds well to the KD. Other conditions that may respond very well to the KD include infantile spasms, Doose syndrome, tuberous sclerosis complex, GLUT-1 transporter deficiency, Dravet syndrome, Rett syndrome and Lennox-Gastaut syndrome.

Section II, *The ABCs of the Ketogenic Diet*, delves into the different methods of KD initiation and provides instruction on how to calculate the needed ratio of macronutrients. Especially helpful are the multiple case studies followed by sample calculations and common questions and answers. Supplements—a necessity when following the KD—are discussed, as well as KetoCalculator, a software program available to assist with menu calculations and planning.

Section III, *Life on the Ketogenic Diet*, covers everything from possible KD side-effects, “fine-tuning” the diet, parent support groups and tips for sticking with the KD when away from home. Also discussed is when and how to wean off of the KD. Currently, the recommended weaning time is much quicker than just a few years ago; complete weaning can be accomplished in as little as ten weeks. There are no set rules for how long the KD can be used—the authors mention they have one patient who has been on the diet for 26 years!

Later sections of the book discuss modified ketogenic diets: the modified Atkins diet (MAD) and low-glycemic index treatments (LGIT), in addition to the medium-chain triglyceride (MCT) ketogenic diet. These are similar to the KD, but aim to control seizures via a less restrictive dietary pattern. One chapter briefly touches upon use of the KD in adults for neurologic conditions other than epilepsy, including brain tumors, traumatic brain injury, Alzheimer’s Disease, autism and ALS.

The book not only includes exchange lists, sample meals plans (for both the traditional KD and modified diets) and several days’ worth of recipes, but also has a chapter brimming with tips on how to implement the KD within restrictions of multiple allergies, gluten and casein-free diets, and vegetarian and religious food preferences. Peppered throughout each chapter are related stories and letters from parents or patients; these morsels are particularly appealing and provide a valuable peek into the real-life triumphs and challenges of the KD.

Several appendices provide a multitude of resources, including keto-friendly medications and products, lists of lab studies for children on the KD, a sample letter of medical necessity for KD formulas, an Atkins carbohydrate gram counter, and a worldwide listing (as of 2010) of physicians experienced in the KD. Ketogenic Diets is highly recommended for any parent or practitioner seeking resources, information and guidance for the KD and its implementation.
Raising Isabella: life with a child who happens to have special needs

Laura Lagano writes this as a mother of a child who has recovered from apraxia with real first-hand experience. She truly understands the daily challenges facing parents. Laura holds a Bachelor of Science in Dietetics from SUNY Oneonta and Master of Science in Nutrition Education from Columbia University, where she is currently a doctoral candidate in health education. Contact Laura at laura.lagano@verizon.net.

No matter how much you read, no matter how much time you spend with children, you are never prepared for how life changes after bringing a child into your world. Multiply that by a very large number and that’s how unprepared you are for raising a child who happens to have special needs. The secret to guiding these children is to follow the path that they set for you. Embrace the journey and learn from it.

My nutrition journey was sparked listening to Carlton Fredericks on New York radio and reading everything by Adelle Davis, who popularized the phrase “you are what you eat.” I was mesmerized by the work of pediatrician Benjamin Feingold who espoused that artificial dyes and flavors in foods triggered hyperactivity in children. Fast forward many years to a 5-year-old Isabella having an inconsolable tantrum following a bit too much Halloween candy (aka: artificial ingredients). Trolling the internet for help, I came across a conference organized by the Feingold Association for children with sensory integration disorders (one of Isabella’s challenges).

My nutrition direction completely changed after attending that meeting and immersing myself in the world of functional medicine. Because of Isabella, I have rediscovered what I consider to be true and honest nutrition–holistic, integrative, and functional. My daughter with special needs took me back to the very reason why I became Registered Dietitian (an RD). Since one fateful day, I have willingly and happily followed the path that Isabella has set for me. I owe my understanding about nutrition, parenting and life to her. I’d like to share a few of my insights with you about children with special needs. You can also check out my blog, http://bellasperanza.wordpress.com/, about raising our Isabella Speranza, which means beautiful hope.

How can you spot a child with special needs?

Parents discover that their children have special needs in several ways and at varying ages. For some, the child is not reaching milestones after birth within the typical ranges. Some children display quirky or odd behaviors that may seem endearing at first and become problematic when interacting with peers. Other children do not get a “diagnosis” until middle school when academic and behavioral expectations increase. Whenever a parent, other family member or neighbor notices that a child is not developing typically, the first visit is to the pediatrician. If the pediatrician is concerned, he or she usually makes a referral to a neurologist or developmental pediatrician. Some pediatricians, however, dismiss parental concerns, particularly when it comes to speech, and say “Let’s wait and watch.” As both a parent and a health professional, my motivating words for parents are: you know your child better than anyone. If the doctor’s assessment does not resonate with your gut feeling, get a second opinion. Better yet, seek the advice of doctors who are trained in integrative and functional medicine.

After the physician, the second most important health professional is the dietitian—one experienced and trained to work with children with special needs. Unfortunately, this referral—whether a self-referral or from the physician—does not happen often enough. Most families (including ours!) go immediately to the person who can fix what’s obviously “wrong”—speech, fine motor skills, behavior, gross motor skills. In reality, these highly-skilled, wonderful professionals usually see better results when children are following “special” food and nutrition plans. Without a healed gastrointestinal (GI) system, children with special needs will not function optimally in therapy.

Not surprisingly, the foundation of functional medicine for most chronic diseases lies in repairing the gut. Following are the basic steps to take to begin to repair the GI system of a child with special needs.

- Remove all artificial ingredients–flavors, colors, preservatives, sweeteners–from the diet. I always recommend this first because it is less overwhelming to parents than the point below.
- Eliminate gluten and casein. Thinking about restricting gluten often produces more anxiety in people than actually removing it from the diet. As most people find that eliminating casein is easier than gluten this is always my first recommendation. It helps that the response to eliminating casein, particularly in terms of GI distress, is frequently more noticeable than removing gluten.
- Add a high-quality (dairy-free) probiotic and take it with food.
- Choose organic foods as much as possible in this order of priority: animal products, ground foods, and produce.
What is the single most important piece of advice for a parent raising a child with special needs?

Do not define the child by his or her disability. As dietitians, we learn this philosophy quite early in our careers. For example, the appropriate terminology is “individual with diabetes,” rather than “diabetic.” It’s not so easy when you have a child who is not typically developing. Every form at every health practitioner’s office asks at what age your child reached every milestone—sitting up, first word, walking, etc. Instead of writing all the dates, I began to put a line through all the questions and simply wrote delayed. That’s what they wanted to know anyway. Was Isabella developing on a typical timeline for an otherwise healthy girl? No. I had an epiphany (always a good thing!). Why do all the doctors and educators focus on the negative? Cue the song “Accentuate the Positive,” maestro. This is perhaps more important for a child with special needs than any other person. Once we began focusing on what Isabella did and what she loved, a world of opportunity opened for her. As a bonus, her father and I started seeing her for who she is, not for who she could have been. (The I-coulda-been-a-contender road is ill-advised.)

What are some important factors for children with special needs that are often overlooked?

Sleep. Sleep. And more sleep. Everyone knows that sleep is crucial to health. During the elementary school years, my children’s teachers sent home guidelines about sleep for young children. Both sleeping an adequate number of hours and sleeping through the night are crucial for all children. In addition, a rested, happy parent makes a much better caretaker.

In my practice I have a sleep questionnaire and counsel families about sleep before diet. Here are a few top tips for encouraging quality shut-eye.

- Remove toys, books, and any distractions from the bed.
- Create a routine and adhere to it every night. Sameness and knowing what to expect are important for every child.
- Turn off all lights including night lights. Light depresses melatonin levels—the sleep hormone.
- Discontinue use of all electronics at least 2 hours before bedtime. Though the jury is still deliberating about the safety of electro-magnetic fields (EMFs), I like to err on the side of caution. Besides, all American children already spend an excessive amount of time using electronic devices.
- Use high-quality Epsom salts with a few drops of organic lavender in a warm bath about 30 minutes prior to bed.
- Drink organic chamomile or similar tea about 30 minutes before bedtime. Sleep covered for 3 minutes and offer at room temperature.
- Rub a few drops of an essential oil calming blend on the bottom of the feet at bedtime or avert in diffuser while sleeping.
- For children who cannot fall asleep or stay asleep after the above methods are consistently in place for one month, try administering one of the following under the supervision of a health practitioner:
  - a very small dose of melatonin in liquid form
  - magnesium in powdered form mixed with water (if diarrhea results, reduce dose)
  - glycine in powdered form mixed in water for those who fall asleep, but wake in the middle of the night

Any other words of wisdom?

In our current societal climate of over-coddling and infantilizing children, raising any child to become an independent, contributing member of society has become challenging. It’s all about giving children roots and wings. The current crop of parents has the roots part of the equation covered, but gets a “needs improvement” grade on the wings part. The over-coddling issue escalates to an exponential extreme when parents have children with special needs (believe me: as an Italian-American type A New York mother, I know). Though it can take more time, more frustration, and more complaining for children with special needs to complete activities of daily living (ADLs), parents must resist the urge to take over. For several years, I observed
as Isabella's peers in her out-of-district placement (code: school for children with special needs) went to sleep-away summer camp. My reasoning for not sending Isabella went something like this: We're not a camp family. I never went to camp. I don't even send my other kids to camp; why would I send Isabella? To my astonishment, someone answered my last rhetorical question. The answer was simple and logical: Isabella needs the away-from-home camp experience more than your other children. She needs the opportunity to spread her wings in a safe environment and begin the journey toward independence.

I immediately signed her up for a residential summer camp. Well, not exactly for the full summer. It was a 2-week session. Just in case, Isabella's twin brother Zachary attended a different overnight program at the same camp at the same time. After the two weeks, guess who wanted to stay for another two weeks and guess who wanted to come home? That first summer Isabella attended camp for four weeks and the second summer for nine weeks. She returned a completely different person, selecting clothing, dressing independently, and doing homework willingly.

Though many modalities for children with special needs have proven track records, many more are “unproven.” Do not let this stand in the way of your child's treatment plan. Peer-reviewed, double-blind placebo-controlled studies, in this mother’s opinion, are not crucial in determining what interventions to select. That, of course, is the polar opposite to what we are taught as health practitioners. Consider that there is a window of opportunity for children with special needs. Though we now know that the brain is plastic, not static as once believed, the window starts closing after puberty and has a smaller opening in adulthood. Children with special needs have proven track records, and changing the behavior of children after puberty and has a smaller opening in adulthood. Children with special needs have proven track records, and changing the behavior of children after puberty and has a smaller opening in adulthood.

Many of the products that I have used for Isabella are specific one-of-a-kind items. Following is my top 10 list of food and nutrition products that have been invaluable in Isabella's healing journey.

1. Phosphatidylcholine (PC): PC is one of the four phospholipids that make up the cell membrane, considered the “essence of life.” If you damage the nucleus, the cell continues to live. Once the membrane is damaged, the cell dies. Children with special needs, who typically have neurological damage, can benefit from PC at high doses to help repair cell damage.

2. Unsweetened Coconut Milk: Though rice and almond milks are often used as substitutes for cow's milk, both are often excessively sweet and devoid of nutrients. Coconut products including oil, butter, and pulp, boast the additional benefit of immune-boosting properties.

3. Organic, Raw Seeds. Many seeds are highly processed, contain gluten, sugars, undesirable oils, and nuts. It's vital to select brands from companies that produce minimally processed organic seeds, which inherently retain its shape better.

4. Fermented Vegetables: Finding naturally, or lacto, fermented vegetables is difficult. Most brands on the market are preserved with vinegar, defeating the purpose of inoculating the gut with friendly bacteria. Look for brands that do not use vinegar and are truly fermented the natural way. Think Korean kimchi.

5. Organic Essential Oils: Essential oils can have an immediate effect in calming and changing the behavior of children with special needs. As essential oils process immediately via the olfactory system, it's important to research the farming and manufacturing practices of brands recommended. Look for a 100% organic essential oil that offers a purity pledge. I encourage all parents of children with special needs to carry oils wherever they travel.

6. Mild-Flavored Toothpaste without Fluoride: Children with special needs frequently have sensory issues that prevent them from practicing good dental care. In addition to having difficulty accepting a toothbrush against the gums, children's tooth pastes flavored with mint, cinnamon, and bubblegum present a sensory overload to these children. Select a mild-tasting, artificial ingredient free brand without fluoride. Fluoride in toothpaste is a concern for children with special needs because they typically have difficulty spitting and therefore swallow tooth paste and other dental hygiene products.

7. Organic Chamomile and night time teas: Though chamomile tea is recommended for sleep, it can be too bitter for young taste buds. The best alternative is combining it with a more palatable tea.

8. Organic Corn Macaroni Products: In my personal experience, I have found that children prefer corn-based, rather than rice and potato-based macaroni products. Corn tastes sweeter and retains its shape better.

9. Probiotics: A dairy-free probiotic is vital to healing the gut of children with special needs. Following the elimination of artificial ingredients, adding a high-quality probiotic is usually my next recommendation. Several excellent brands are on the market.

10. Enzymes: Similar to probiotics, enzymes are crucial to repairing the GI systems of children with special needs.

References:
Dear Members,

Welcome to an exciting year at DIFM. It’s been a long and busy summer. Like many others, I also caught Olympic Fever. I watched the athletes with awe, respect, and some encouragement that any one of us is capable of doing more than we think we can. The Olympics are a metaphor for what we can achieve in our profession as well. It is our time to up our game. DIFM is going for Gold. We are treading in uncharted waters. As integrative nutrition is entering into the mainstream of the profession, DIFM members are in the best position to help the Academy come up to speed on practices and techniques that many of us have been using for years. We are uniquely placed to help lead the Academy’s positions and policies regarding integrative nutrition. Since it is clear that we speak for many, it is imperative that the Academy hears from you. You can be heard by inviting new members to join DIFM and former members to renew. Please attend our meetings and webinars to show support and to benefit from the cutting edge functional nutrition information and/or volunteer if you can for one of many opportunities with the DPG. Or be in the audience and cheer for Kathie Swift, MS, RD, LDN, Mary Beth Augustine, CDN RD and the task force committee DIFM has working on the integrative nutrition specialization. They have been tirelessly moving the Task Force Committee forward and our petition is now awaiting approval.

DIFM is gearing up for all the education opportunities that lead the way to the credential. The bar is set quite high. Pre-FNCE is our first in-person event for 2012-2013. We hope you join us in Philadelphia for the Pre-FNCE workshop: IntegrativeRD: Nutrition as Medicine; Confronting Cardiometabolic Syndrome, An Integrative Approach. We are grateful to have the prestigious speakers: Coco Newton, MPH, RD, CCN, Mark Hyman MD, Laurel Mellin MA, RD, PhDc, and Kathie Swift MS, RD, LDN. By attending and asking a friend to join you, you show that there is a need for our curriculums and for members and non-members to learn about integrative nutrition. Register on-line today at www.eatright.org/dpgevents.

Stop by the DIFM Booth at the DPG Showcase and Product Marketplace where the Executive Committee will be eager to hear from you. DIFM can grow best and exponentially with your input and help. Share your thoughts, offer suggestions, and volunteer for an ongoing or onetime project. We are also looking forward to meeting you at our Members’ Breakfast on Monday, October 8, 2012 at 7:00 AM, at the Loews Hotel! We’d like to thank Biothera for their generous sponsorship of this year’s Member Breakfast. Here we will have the privilege of presenting several awards to outstanding DIFM members. Colleen Fogarty Draper, MS, RD, LDN is this year’s recipient of the Excellence in Service Award. She has been on the executive committee as the Genomics Chair and continues to serve as the Genomics Advisor. Colleen just recently began a job with the Nestlé Corporation and is starting a new adventure in Switzerland. We are so proud of her and wish her an exciting next chapter. The Excellence in Practice Award goes to Mary Beth Augustine, CDN RD. She has been a pioneer in integrative nutrition practice and she has been generous with her mentoring and internship opportunities. Monique Richard, the recipient of the DIFM Student Stipend award, is the Student Committee Chair for DIFM and serves as the Student Outreach Chair for the American Overseas Dietetic Association, an affiliate of the Academy. This year we are presenting a special Visionary Award to Kathie Madonna Swift, MS, RD, LDN. Kathie has been a leader in integrative nutrition education and practice, and a valuable mentor, spokesperson and author. Kathie serves on several boards and very generously continues to volunteer her time to DIFM. She was a visionary when she began collaborating with other health care professionals to put dietitians on the map. Kathie is very well respected throughout the Integrative and Functional Medicine and the Western Medicine worlds. It is our honor to present this first time award to such a deserving woman.

I am looking forward to meeting you at FNCE!

Healthy Regards,
Alicia
Welcome to Fall and FNCE. As you read in the summer newsletters and from this issue, not only do we have cutting edge educational programs for you at this year’s FNCE, there will also be multiple opportunities to network with those in-the-know about integrative and functional medicine—the DIFM Executive Committee (EC) and members.

As I was perusing the schedule for this year’s conference and exhibition, I was pleased to see the number of topics that would not have been accepted in not-so-distant years back—Neuroprotective Nutrition: Dietary Factors and Supplementation for the Prevention of Cognitive Decline; From Discovery to the Fork: Get Ready for Nutrigenomics; Celiac Disease: It’s Not Just the Digestive Tract; and Diet Therapy for Adults with Epilepsy: Fat Is Your Friend, just to name a few.

I am anxious to attend these and others to see what may be new and innovative.

The DIFM EC and I are hopeful that you will be able to attend the pre-FNCE conference, Integrative RD: Nutrition as Medicine; Confronting Cardiometabolic Syndrome, An Integrative Approach. This promises to be chock full of information that you can take home and put to use immediately in your practice, whatever or wherever it is. The breakfast, sponsored by Biothera, entitled: Linking Evidence-Based Nutrition to Immune Health should be thought-provoking, especially as we approach winter when we all need to make sure our immune systems are functioning optimally.

I am looking forward to the opportunity to see old friends, make new ones, and to network with the many knowledgeable members who will be attending our programs and FNCE. Please take the opportunity to visit with me at any one of our events or booth and let me know what you would like from the newsletter. I would be more than happy to visit with you and perhaps enlist your help with the newsletter or any one of the opportunities that DIFM has to offer for member volunteers.

As always, your feedback and offers to write for or help with the newsletter are more than welcome. Feel free to email me at peaknut70@gmail.com. See you in Philadelphia!
THANK YOU TO OUR SPONSOR
Without your generous contribution, many of the opportunities and member benefits would not be possible.

DIFM Events at FNCE

Saturday, October 6, 2012
Pre-FNCE DIFM Workshop
Integrative RD: Nutrition As Medicine Confronting Cardio-Metabolic Syndrome
7:45 AM to 3:30 PM Registration 7 AM to 7:45 AM
Loews Philadelphia Hotel, Commonwealth Room

Sunday, October 7, 2012
Product Market Place
9:00 AM to 3:00 PM
Pennsylvania Convention Center,
Adjacent to the Culinary Demonstration Theater

Monday, October 8, 2012
Members Breakfast
Linking Evidence-Based Nutrition to Immune Health
7:00 AM
Loews Philadelphia Hotel, Commonwealth Room
Generously funded by Biothera,
maker of Wellmune WGP®

DPG/MIG Showcase
Monday, October 8, 2012
10:30 AM to 1:00 PM
Adjacent to the Culinary Demonstration Theater in the Expo Hall.
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