Food Allergies Guide for Dietitians

(#094998)

(Florida CE Provider #: 50-8625)

Vantage Professional Education

P.O. Box 172835
Tampa, FL 33672
(813) 463-1918

Visit our Web-Site www.VantageProEd.com
E-mail vantagepro@aol.com

Dietitians 5 CEU's only $47.50 **($9.50 per CEU)**

These reports can be used to satisfy Continuing Education requirements. Place a copy in your office for other healthcare professionals to use.

About the Authors:

Nicole Kerneen-Fasules, R.D., C.D., is a registered dietitian and certified personal trainer who has worked in the Milwaukee, WI area for the past 12 years. She received her Bachelor of Science in Dietetics degree at Mount Mary College in Milwaukee. She pursued additional training in fitness training with the National Exercise Training Association. Her experiences include outpatient counseling, food allergy consulting, long-term-care consulting, fitness club dietitian consultant, corporate wellness and professional speaking. She has also worked with the local media and has written many articles on various nutrition and fitness topics. Nicole is currently the owner of Way Of Life Nutrition and Fitness providing consulting, program design and food services for individuals, families and corporations. .

Preface

Vantage Professional Education has a mission to serve as an information resource to enhance the knowledge and personal development of healthcare professionals. These reports can be used to satisfy continuing education requirements. ***Place a copy of this report in your office for other healthcare professionals to use.***

Tests can also be taken online or download free copies of our reports:
http://www.VantageProEd.com

Continuing Education Accreditation and Credits

Dietitians: RD, CDE, LDN, DTR

This activity is approved for **5 Continuing Professional Education Units as a Level II Activity** - assumes that you have some prior knowledge of literature and professional practice in the subject area. Activity Expiration Date: 04/24/13

How to Obtain Your Continuing Education Credits

Complete the answer sheet found in Section X. Make a copy of the answer sheet. This will keep the entire course intact so that other healthcare providers can use this course to satisfy their continuing education requirements.

1. Mail the completed answer sheet to:

Ms. Angela Turton, Registrar
Vantage Professional Education
P.O. Box 172835
Tampa, FL 33672

2. **We will mail you a Certificate of Completion for your Activity Log for the CDR reporting.** You must have a passing grade of 70% or better to document your successful mastery of the course content. If you do not receive a passing grade, a letter notifying you of your non-passing status will be sent to you along with a new answer sheet to use with the same test questions.

Important Notice: Payment must be submitted before a Certificate of Completion can be issued.

Accreditation

CPE Accredited Provider
Commission on Dietetic Registration
the credentialing agency for the Academy of Nutrition and Dietetics

Vantage Professional Education (Provider Number VA002) is a **Continuing Education Professional Education (CPE) Accredited Provider** with the *Commission on Dietetic Registration (CDR.*

Guarantee
We guarantee our Continuing Education Certificates. If for any reason your state does not accept our Continuing Education Credits, we will refund the amount paid by the student for the Continuing Education Certificate.

Table of Contents

Section VII: Food Allergy Awareness

Section VIII: Case Studies

Section I. Course Objectives

Introduction

Each year, millions of Americans have allergic reactions to food. Although most food allergies cause relatively mild and minor symptoms, some food allergies can cause severe reactions, and may even be life-threatening.

There is no cure for food allergies. Strict avoidance of food allergens — and early recognition and management of allergic reactions to food — are important measures to prevent serious health consequences.

The dietitian plays a critical role in empowering those under their care to manage food allergy and may play an integral role in supporting the physician in the diagnostic process.

Course Objectives

At the conclusion of this program, participants will be able to:

1. Distinguish food allergy from adverse food reactions.
2. Identify the main food allergens and their prevalence.
3. Understand food allergy symptoms, testing, and management.
4. Describe clinical cross-reactivity.
5. Understand the "Food Allergen Labeling and Consumer Protection Act of 2004 (FALCPA)".
6. Identify high risk situations for allergic patients.
7. Understand food allergy awareness.

Section II: Distinguishing Food Reaction

Food Allergy

A food allergy is an immune system response to a food that the body mistakenly believes is harmful. Food normally doesn't provoke a response from the human immune system, the body's defense against microbes and other threats to health. In food allergies, two parts of the immune response are involved, according to researchers at the National Institute of Allergy and Infectious Diseases. One is the production of an antibody called immunoglobulin E (IgE) that circulates in the blood. The other part is a type of cell called a mast cell. Mast cells occur in all body tissues but especially in areas that are typical sites of allergic reactions, including the nose, throat, lungs, skin, and gastrointestinal tract.[1]

People usually inherit the ability to form IgE against food. Those more likely to develop food allergies come from families in which allergies such as hay fever, asthma, or eczema.[2]

A predisposed person must first be exposed to a specific food before IgE is formed. As this food is digested for the first time, tiny protein fragments prompt certain cells to produce specific IgE against that food. The IgE then attaches to the surface of mast cells. The next time the particular food is eaten; the protein interacts with the specific IgE on the mast cells and triggers the release of chemicals such as histamine that produce the symptoms of an allergic reaction.

If the mast cells release chemicals in the nose and throat, the allergic person may experience an itching tongue or mouth and may have trouble breathing or swallowing. If mast cells in the gastrointestinal tract

are involved, the person may have diarrhea or abdominal pain. Skin mast cells can produce hives or intense itching.

The food protein fragments responsible for an allergic reaction are not broken down by cooking or by stomach acids or enzymes that digest food. These proteins can cross the gastrointestinal lining, travel through the bloodstream and cause allergic reactions throughout the body.

The timing and location of an allergic reaction to food is affected by digestion. For example, an allergic person may first experience a severe itching of the tongue or "tingling lips." Vomiting, cramps or diarrhea may follow. Later, as allergens enter the bloodstream and travel throughout the body, they can cause a drop in blood pressure, hives or eczema, or asthma when they reach the lungs. The onset of these symptoms may vary from a few minutes to an hour or two after the food is eaten.[3]

Adverse Food Reaction and Food Intolerance

Food intolerance or adverse food reaction is an undesirable reaction to a food that does not involve the immune system. It is easy to confuse food intolerance with food allergy because they can have similar symptoms.[4]

The types of food intolerance are:

1. Food poisoning

   One possible cause of symptoms like those of food allergy is food contaminated with microbes, such as bacteria, and bacterial products, such as toxins. Contaminated meat and dairy products sometimes cause symptoms, including GI discomfort, that resemble a food allergy when it is really a type of food poisoning.

2. Histamine toxicity

   There are substances, such as the powerful chemical histamine, present in certain foods that cause a reaction similar to an allergic reaction. For example, histamine can reach high levels in cheese, some wines, and certain kinds of fish such as tuna and mackerel.

   In fish, histamine is believed to come from contamination by bacteria, particularly in fish that are not refrigerated properly. One of these foods with a high level of histamine could cause histamine toxicity, a reaction that strongly resembles an allergic reaction.

3. Lactose intolerance

   Another cause of food intolerance confused with a food allergy is lactose intolerance or lactase deficiency. This common food intolerance affects at least 1 out of 10 people.

   Lactase is an enzyme that breaks down or digests lactose, a sugar found in milk and most milk products. Lactose intolerance, or lactase deficiency, happens when there is not enough lactase to digest lactose. Bacteria use lactose to form gas which causes bloating, abdominal pain, and sometimes diarrhea.

4. Food additives

   Another type of food intolerance is a reaction to certain products that are added to food to enhance taste, provide color, or protect against the growth of microbes. Several chemical

compounds, such as MSG (monosodium glutamate) and sulfites are tied to reactions that can be confused with food allergy.

5. MSG

Monosodium glutamate (MSG) is a flavor enhancer commonly added to Chinese food, canned vegetables, soups and processed meats. Although the Food and Drug Administration (FDA) has classified MSG as a food ingredient that is "generally recognized as safe," the use of MSG remains controversial.

MSG has been used as a food additive for decades. Over the years, the Mayo Clinic reports that the FDA has received many anecdotal reports of adverse reactions to foods containing MSG. But subsequent research found no definitive evidence of a link between MSG and the symptoms that some people described after eating food containing MSG. As a result, MSG is still added to some foods.[5]

A comprehensive review of all available scientific data on glutamate safety sponsored by the FDA in 1995 reaffirmed the safety of MSG when consumed at levels typically used in cooking and food manufacturing. The report found no evidence to suggest that MSG contributes to any long-term health problems, such as Alzheimer's disease. But it did acknowledge that some people may have short-term reactions to MSG. These reactions - known as MSG symptom complex - may include:

- Headache, sometimes called MSG headache
- Flushing
- Sweating
- Sense of facial pressure or tightness
- Numbness, tingling or burning in or around the mouth
- Rapid, fluttering heartbeats (heart palpitations)
- Chest pain
- Shortness of breath
- Nausea
- Weakness

Symptoms are usually mild and don't require treatment. However, some people report more severe reactions. The only way to prevent a reaction is to avoid foods containing MSG. When MSG is added to food, the FDA requires that "monosodium glutamate" be listed on the label — or on the menu, in restaurants. These passing reactions occur rapidly after eating large amounts of food to which MSG has been added.

6. Sulfites

Sulfites in high concentrations sometimes pose problems for people with severe asthma. Sulfites can give off a gas called sulfur dioxide that a person with asthma inhales while eating food containing sulfites. This gas irritates the lungs and can send an asthmatic into severe bronchospasm.

7. Gluten intolerance

Gluten intolerance is associated with the disease called “gluten-sensitive enteropathy” or “celiac disease.” It happens if the immune system responds abnormally to gluten, which is a part of wheat and some other grains. Some researchers include celiac disease as a food allergy. This

abnormal immune system response, however, does not involve IgE antibody. However, in this course gluten intolerance is under the umbrella of food allergies.[6]

8. Psychological causes

   Some people may have a food intolerance that has a psychological trigger. If food intolerance is caused by this type of trigger, a careful psychiatric evaluation may identify an unpleasant event, often during childhood, tied to eating a particular food. Eating that food years later is associated with a rush of unpleasant sensations.

   Food aversion is diagnosed when the patient is psychologically convinced that they are food allergic. They might have had a viral illness with vomiting, thought it was an allergy and then blames a specific food. But if the food is disguised and then given it to them, they fail to react adversely.

   Often their symptoms will be quite bizarre and not match any particular clinical picture. It can be very difficult to convince these patients that they are not food allergic or intolerant, and often "Alternative" practitioners will have reinforced their food aversion.[7]

9. Other causes

   There are several other conditions, including ulcers and cancers of the GI tract that cause some of the same symptoms as food allergy. These symptoms include vomiting, diarrhea, and cramping abdominal pain made worse by eating.

Section III: Food Allergy Prevalence

Prevalence of Food Allergy

The National Institute for Environmental Health reports that as many as 30% of American adults self-report food allergy and alter their eating habits accordingly. Similarly, nearly one-third of parents perceive adverse food reactions to be responsible for a multitude of symptoms in their children and modify their children's diets in response.[8]

Although accurate and recent epidemiologic data are scarce, current estimates of the prevalence of food allergy suggest that approximately 5% of young children and 2% of adults have reproducible symptoms resulting from food allergy. Despite greater awareness and recognition of food allergy by both physicians and patients, many allergists believe that the actual prevalence has risen substantially over the past decade, similar to the rise in prevalence of other atopic conditions such as asthma and allergic rhinitis.

The National Center for Disease Control and Prevention (CDC) reports that it is estimated that 12 million Americans have food allergies, with 6.9 allergic to seafood and 3.3 million allergic to peanuts or tree nuts Each year 30,000 people go to the emergency room and 150-200 people die from food allergic reactions.[9]

The greater prevalence of food allergy in children reflects both the increased predisposition of children to develop food allergies and the development of immunologic tolerance to certain foods over time. Immunoglobulin (IgE)-mediated food allergies can be classified as those that persist indefinitely and those that are predominantly transient. Although there is overlap between the two groups, certain foods are more likely than others to be tolerated in late childhood and adulthood. The diagnosis of food allergy rests with the detection of food-specific IgE in the context of a convincing history of type I

hypersensitivity-mediated symptoms after ingestion of the suspected food or by eliciting IgE-mediated symptoms after controlled administration of the suspected food**.**

Natural History of Food Allergy

Most food allergies have their onset in infancy or early childhood, depending on when the food is introduced into the diet. Theoretically, any food containing a protein could elicit an allergic reaction; however, eight common foods are responsible for more than 90% of food allergies. The natural history of food allergy in adults is slightly different from that in children, who tend to rapidly outgrown their allergies. As a result food allergy is more common in children but most will outgrow it.[10]

If foods are completely avoided, up to 30% of adults will become clinically non-reactive to an offending food over a 2-year elimination period. They will however remain atopic - that is maintain a positive Skin Prick Test or retains specific IgE antibodies to the food, but have no reaction if they eat the food.

The Mayo Clinic reports that most food allergy also varies from country to country depending on local eating habits - the more a food is consumed in a country - the higher the incidence of allergy to it. Peanut allergies are significant in the United States, fish allergies in Scandinavia, poppy seed allergies in Eastern Europe, sesame allergies in the Middle East, and in rice allergies in Japan**.**[11]

Most food allergies can be classified as "likely to resolve" or "likely to persist." Food allergies that usually resolve are:

- Milk
- Soy
- Egg
- Wheat

These allergies typically present in infancy and usually resolve by school age. Food allergies that usually persist include:

- Peanut
- Tree Nuts
- Fish
- Shellfish

These, too, usually present in early childhood, shortly after the introduction of these foods into the usual diet. Although most individuals with allergies to foods in this latter group tend to persist with these allergies indefinitely, some children will develop tolerance to these foods and will be able to reintroduce them safely into their diet.

Food Allergies - Likely to Resolve

1. **Milk**

   Milk allergy almost always presents in the first year of life, soon after the introduction of cow's milk or cow's milk-based infant formula, and usually resolves by school age. Most infants with cow's milk allergy develop gastrointestinal symptoms, approximately 50-70% have cutaneous features, and about 20-30% will have respiratory symptoms. Milk allergy affects up to 2.5% of infants, with approximately 1% of all children developing IgE-mediated milk allergy and approximately 1.5% of children developing non-IgE-mediated milk allergy.[12]

Milk allergy usually resolves by school age, but among highly atopic children, milk allergy is more likely to persist.

Risk factors for persistence of milk allergy include early dermatitis presentation of milk allergy; development of other atopic conditions, including other food allergies, asthma, and allergic rhinitis; and persistence of elevated levels of milk-specific IgE . In general, as tolerance to IgE-mediated milk allergy is achieved, the size of the wheal and flare on the skin prick tests decreases; however, it may continue to remain positive beyond acquisition of clinical tolerance. Serum-specific IgE, measured by the ImmunoCAP system, appears to be a more sensitive measure for the prediction of food allergy resolution, especially in patients with atopic dermatitis.

2. Soy

Soy is considered a major food allergen and is a food introduced to infants in the form of infant formulas and cereals. Soy-based infant formulas are recommended for families following vegetarian dietary restrictions, for children with congenital or acquired lactose intolerance, and for infants with diagnosed IgE-mediated cow's milk allergy. Of children with IgE-mediated cow's milk allergy, fewer than 15% will develop a concomitant allergy to soy, but most infants will tolerate soy protein without difficulty.

The National Institute of Allergy and Infectious Diseases reports the prevalence of soy allergy/soy intolerance varies with the frequency with which soy is introduced into regional diets, but it appears to affect 1-6% of infants. Symptoms associated with soy allergy include typical IgE-mediated features as well as non-IgE-mediated--gastrointestinal symptoms such as hematochezia and malabsorption. Both skin prick tests and food-specific IgE are used to detect the presence of IgE; however, both modalities have poor specificity and positive predictive values. The natural history of IgE-mediated soy allergy is similar to that of other "predominantly transient" allergies, and most children can tolerate soy products by school age. [13]

3. Egg

The prevalence of egg allergy is estimated at 1.6-2.6% of the general pediatric population but is significantly higher among individuals with atopic dermatitis and other collateral atopic conditions. Most children developing allergic symptoms to ingestion of egg develop symptoms within 30 min. More than 85% of egg-allergic children develop cutaneous symptoms, 60% have gastrointestinal symptoms, and up to 40% will have associated respiratory symptoms. 44% of egg-allergic children were able to reintroduce egg products into their diet by school age, but the remaining 56% persisted with egg allergy. Children with persistent egg allergy had significantly more target organs affected at the time of the initial allergic reaction, were more likely to acquire additional atopic conditions, and continued to have positive prick skin tests to egg.[14]

Food Allergies - Likely to Persist

1. Peanuts

Peanut allergy deserves particular attention because it almost always presents early in life, is often severe, generally persists indefinitely, and is the most common cause of fatal food-related anaphylaxis. Additionally, because of peanut's relative ubiquity, accidental exposures occur frequently. The prevalence of peanut allergy is approximately 0.6%, and there is some evidence that this has increased.[15]

Approximately 80% of peanut-allergic children develop allergic symptoms at the time of their first known exposure to peanut. More than 90% develop symptoms within 30 min of ingestion, 90% have cutaneous features, 40% have respiratory symptoms, and 50% develop allergic manifestations to contact alone. After diagnosis and despite avoidance measures, most peanut-allergic children have accidental exposures to peanut resulting in allergic symptoms, and more than 40% of subsequent allergic reactions may be more severe than the initial reaction.

Up to 20% of peanut-allergic children will become tolerant to peanut and will be able to reintroduce peanut into their diets. Factors that appear to predict resolution of peanut allergy include mild cutaneous allergic features at onset, fewer associated atopic features, loss or diminution of skin prick test reactions to peanut, and low levels of peanut-specific IgE.

2. Fish and Shellfish

It is possible for some people who are allergic to one type of seafood (fish, crustacean or shellfish) to eat other types of seafood without having a reaction. However, when a patient has a specific seafood allergy he/she may also be allergic to other species within the same group.[16]

Most people with seafood allergy are sensitive to only 1 or 2 proteins that may be present in multiple species. There is a risk of cross-reactive allergic responses to other animals in that group as well. This risk is estimated at between 50 and 75 %. Patients allergic to seafood from one group can usually tolerate those from another. For this reason, complete avoidance of one or more groups of seafood is often advised.

Occasionally, intense cooking will partially or completely destroy the triggering allergen. This may explain why some patients allergic to fresh fish are able to tolerate tinned salmon or tuna.

Section IV: Food Allergy Symptoms, Testing, and the Role of the Dietitian

Symptoms of Food Allergy

Symptoms of food allergic reactions are manifested on the skin, in the gastrointestinal (GI) tract, or in the respiratory system, either individually or in combination, sometimes causing generalized anaphylaxis. Food allergies are the leading cause of anaphylaxis treated in emergency rooms in many countries.[17]

Skin

The Mayo Clinic reports the most common food allergy symptoms involve the skin, in the form of itching, swelling, hives, eczema and/or redness. Up to 20% of acute hives are caused by food allergy: hives lasting more than six weeks are rarely caused by food allergy. 37 % of children with moderate to severe atopic dermatitis also have food allergy.

Respiratory Tract

The upper and lower respiratory tract can be the target of IgE-mediated food allergy, with symptoms including congested, runny, and/or itchy nose (rhinitis) sneezing, raspy cough, and/or wheezing. Nasal symptoms occur in 25-80% of food allergic patients. However, nasal symptoms in isolation are usually not food related. Asthma is food related in only 5.7% of asthmatic children.

Heiner Syndrome is a rare adverse pulmonary response to cow's milk that occurs in a very small percentage of infants. It is characterized by repeated pneumonia, and may result in iron-deficiency anemia and even failure to thrive.

Anaphylaxis

A panel convened by the National Institute of Allergy and Infectious Disease (NIAID) and the Food Allergy and Anaphylaxis Network (FAAN) in 2005 defined anaphylaxis as " a serious allergic reaction that is rapid in onset and may cause hives, swelling of the throat, difficulty breathing, and/or the loss of consciousness." It results in 150-200 deaths per year in the United States Food allergy is the most common cause of outpatient anaphylaxis.[18]

The primary treatment is an epinephrine (adrenaline) shot, which must be administered promptly in order to be effective. Factors associated with fatal food-induced anaphylaxis are:

- Allergy to peanut or tree nuts
- Teen or young adult (less likely to carry epinephrine or tell friends about allergy)
- Coexistent asthma
- Failure to promptly administer epinephrine (lack of preparedness and/or education)

GI Tract

Cell-mediated allergic reactions to food are not clearly defined as IgE mediated reactions. Some researchers believe T cells respond directly to the allergic protein, acting with macrophages and other inflammatory cells to cause inflammation in the GI tract and skin.

Celiac Disease, also known as Celiac or gluten-sensitive enteropathy is the most well known example of cell-mediated allergic reaction. Celiac Disease is a hypersensitivity to gluten in which the immune system damages the villi of the small intestine and causes chronic inflammation. It is both an autoimmune disorder and a disease of amalabsorption.[19]

Dermatitis herpetiformis is chronic skin disorder that may occur simultaneously with Celiac Disease or alone. It is associated with a specific IgA-mediated immune sensitivity to gluten.

Celiac Disease symptoms are similar to and often confused with other ailments:

- Irritable bowel syndrome (IBS)
- Crohn's disease
- Diverticulitis
- Intestinal infection
- Chronic fatigue syndrome

A patient with Celtiac Disease may also be asymptomatic, therefore increasing the risk doe malnutrition-related complications. Malnutrition as a result of Celiac Disease may cause:

- Weight changes
- Dental problems
- Fatigue
- Anemia
- Osteopenia/osteoporosis
- Behavioral changes
- Nerve Damage
- Muscle cramps
- Seizures
- Ammenorhea
- Miscarriage
- Infertility

- Delayed growth
- Failure to thrive as an infant

The Role of the Dietitian

The Dietitian has a critical role in both diagnosing a suspected food allergy and supporting and helping patients manage a food allergy reports The International Food Information Council (IFIC) Foundation.

The first step in the diagnosis of a suspected food allergy is a series of questions to identify suspected foods and determine what further tests should be done to verify food allergy.[20]

Some sample questions are:

- Does anyone in the family have allergies? If so, who has allergies and to what are they allergic?
- What are the typical symptoms of the reaction and what is the order in which the symptoms occur?
- Did the reaction cause any breathing, skin and/or digestive symptoms?
- What was the length of time between consumption of the suspected food and the first sign of reaction?
- How much food was eaten to trigger the reaction?
- Does a similar reaction occur each time the food is eaten?
- Were any prescription medications or over-the-counter drugs taken at the time of the reaction?
- Have there been any recent changes in living situation, for example new pets, remodeling, move to a new home, etc.?
- How was the reaction treated? How long did it take to resume your normal activities?

If a food allergy is suspected the patient should be referred to the primary care physician or a board-certified allergist. The dietician's role is to support the physician and allergist during the diagnostic procedure by helping the patient to complete a food diary and to assist with the supervised diets and tests.[21]

Testing

1) Serum IgE Concentration

Blood is checked for how much of IgE (Immunogolobin E) it contains. High levels of this type of antibody may indicate allergies. This test is a simple screening test and does not provide specific information regarding what is causing more IgE then normal to be released.

2) Radioallergosorbent Test (RAST)

Blood is placed on an absorbent disc that contains specific food proteins. The disc is then measured for levels of these antibodies. Different laboratories have different systems for numerically ranking the response. In general, high numbers indicate a high level of antibodies.

However, this test is not very specific, so if blood reacts to the food, it may or may not mean an allergy to that specific food. This is called a false positive reaction. One reason for a false positive result may be the similarities between various foods of a food family. Between 50 and 60 percent of positive test results are false positives.

3) Prick Skin Tests

This test involves introducing a solution containing a specific food protein into the top layer of the skin using a blunt two-pronged needle or similar device. Approximately 15 minutes after the solution has been administered, the results are read. For the testing of fruits and vegetables, the actual fresh food may be used rather than a solution. Reading the results involves precise measurement of skin reaction. Positive results are indicated by a hive (raised white bump usually irregularly shaped) surrounded by an area of increased reddening of the skin.

Any food to which the skin showed a reaction is called a positive result. In general, a large hive is more likely to indicate a true food allergy, but size is not always an accurate predictor. Prick skin test, like RAST, can be inaccurate, with 50 to 60 percent of positive test results being false positive. The test results should be compared with the case history and other tests to determine which of the results are true positives.

4) Double-Blind, Placebo-Controlled Food Challenge (DBPCFC)

This testing method is considered to be the gold standard for the diagnosis of a food allergy. In fact, it is so accurate it is often used to verify the results of other tests. A food challenge has the potential for causing an allergic reaction and should only be performed with proper medical supervision and immediate access to emergency medical services.

The test requires a safe food that contains either a specific food amount of a suspect food allergic or a placebo food be eaten. The food challenge is given in measured doses. Following each dose the patient is observed for a period of time for any signs of a reaction. In the absence of symptoms, increasingly larger doses are given. [22]

5) Open Challenge

In this type of food challenge, the patient will be asked to eat a suspect food that is not disguised in any way. Open challenges are used primarily in two situations. The first is a final confirmation of negative DBPCFC results. A standard portion of the suspected food is eaten to verify no allergic reaction. An open challenge is also used to test a food that produced a positive RAST or prick skin test result, yet though the patient's history is not thought to be causing any allergic reaction. Like the DBPCFC, open challenges have the potential risk of causing an allergic reaction and should only be performed with proper medical supervision.

6) Elimination Diets

If there is a strong positive RAST or prick skin test result, a trial elimination diet is recommended. This type of elimination diet restricts a particular food or foods for a period of 2-4 weeks. If symptoms improve significantly a true food allergy is suggested. If, however, symptoms do not improve or if there were unclear improvement, then food challenges should be recommended to clarify the results.

The long-term use of an elimination diet should always be verified with a DBPCFC. If the patient is on an elimination diet, a nutritional assessment should be obtained initially and at least every six months or whenever a food is removed from the diet to ensure adequate energy and nutrient intake.

Section V: Clinical Cross-Reactivity

Cross-Reactivity

Many foods share similar proteins, often because they are from related families. However, true clinical cross reactivity varies. For example, if the patient is allergic to shrimp they are likely to be allergic to crab, lobster, and crayfish. However, a patient allergic to peanut usually can tolerate other beans. [23]

Cross-reactivity is oral allergy syndrome (pollen-food allergy syndrome). When a patient who is allergic to a certain type of pollen consumes raw fruit or vegetable with related proteins, they may experience an allergic reaction tot the pollen. A person Allergic to birch tree pollen may have symptoms with peach, apple, or other Rosaciae family foods. The syndrome varies because a person with birch pollen allergy may react to one, none, or several of the related foods. Also, unlike some types of food allergies, symptoms are usually localized only to the mouth and throat and resolve rapidly. Cooked forms of the same foods will typically not cause a reaction.

Peanut Allergies

Peanut allergy is one of the most common, serious and potentially fatal food allergies. It is an immune response (involving the IgE antibodies) to peanut protein, causing the release of histamine chemicals in the body which result in a host of symptoms. Anaphylaxis is a severe IgE antibody triggered reaction which requires urgent medical attention and the administration of epinephrine to stop the reaction.[24]

Studies show that there has been a sharp increase in peanut allergies over the last 5-10 years, particularly in children, not only in the US but in Australia and the UK. A common question is why? Although no definitive answer is available, there are several theories: that we introduce peanuts to children too early; the increased use of soy in formula and other processed food (soy and peanut are both beans); and the use of roasted peanuts in food (heating changes the protein which the body is more likely to react to), rather than raw/boiled peanuts. Another common theory is the hygiene hypothesis which believes that the immune systems have little to fight anymore because we live in a cleaner, healthier, antibacterial world and therefore, the immune system reacts to certain food proteins and mistakes them for a threat. A lowered immune function due to increased antibiotic use, vaccinations, high processed food and pesticide use are also factors to be considered. Symptoms of a peanut allergic reaction can occur immediately or over a period of up to two hours. Peanut allergy reactions can be unpredictable and caution is always required. Peanut allergy symptoms affect various systems of the body and include:

- Hives/urticaria/wheals (small raised itchy areas likened to bites)
- Itchy red skin, rashes
- Congested runny nose
- Pain in the stomach, vomiting, nausea, diarrhea
- Swelling/edema of the lips, skin tongue and airways (causing constriction, wheezing and difficulty breathing)
- Shock (as blood pressure drops and the blood struggles to pump blood around the body)

The smell of peanuts or even second hand contact like kissing or shaking hands with someone else that has eaten a peanut product has been reported to produce an allergic reaction. People with severe peanut allergy are at risk of suffering anaphylactic shock.

Peanut (Arachis hypogaea) is actually a bean/legume vine plant that grows underground. It is related to other beans (such as peas, beans and lentils) but it is probably unnecessary to avoid them unless your doctor tells you otherwise. It is more common for someone with peanut allergy to react to nuts from trees, particularly almonds, walnuts, hazelnuts, Brazil nuts, or cashews. However, some peanut allergic patients find they can eat these nuts without a problem.

The Food Allergy Initiative warns that <u>if any of the following items are listed as an ingredient in a food, it will not be peanut free.</u> [25]

- Peanut / may contain traces of peanuts
- Cold-pressed or expeller pressed peanut oil
- Ground nuts
- Mixed nuts
- Peanut butter
- Peanut flour
- Peanut oil
- Peanut starch
- Beer nuts
- Arachis
- Gianduja
- Goober peas or nuts
- Mandalona (a nut substitute derived from peanut meal)

Peanut can be found in many foods in different forms, as an emulsifier or thickening agent, i.e., (in prepared foods, fried prepared foods, battered foods and roasted chickens may contain peanut oil). Candy – peanut ingredients may be found in candy and it is best to use only wrapped candy where you can read the ingredient label. Asian cuisine has a high percentage or foods made with peanut or peanut derivatives. Hydrolyzed vegetable protein or plant protein may contain peanut. Vegetable oil / hydrogenated vegetable oil (label may not specify that oil may be a combination of oils and may contain peanut oil).

Some common sources of foods containing peanuts are:

- Asian foods
- Baked goods – breads, muffins, pastries, cookies
- Baking mixes
- Cereals
- Granola
- Crackers
- Chili
- Ice cream
- Mortadella
- Nut butters
- Sauces (peanuts often used as a thickener). Soups (mostly dried)

Tree Nut Allergy

If a child has a peanut allergy, there is an increased likelihood that the child can develop a tree nut allergy. Most experts suggest that people allergic to tree nuts avoid peanuts as well.

Tree nuts can be especially dangerous because they are hidden in so many places where you might not expect to find them. Tree nuts often show up in lotions and shampoos.[26]

The common names of tree nuts:

- Cashews
- Pecans
- Macadamia nuts
- Almonds
- Pistachios
- Brazil nuts
- Pine nuts
- Hazelnuts
- Walnuts
- hickory nuts
- Beech nut
- Butternut
- Chestnut
- Coconut
- Ginko nut
- Lichee nut
- Pili nut
- Sheanut
- Natural nut extract
- Artificial nuts
- Nnut meal
- Caponatanut meat
- Nut oil
- Nut paste (such as almond paste)
- Gianduja (a nut mixture in some chocolate)
- Nut pieces
- Pesto
- Mandelonas
- Marzipan/almond paste
- Nan-gai nuts
- Nougat
- Pralines
- Nut butters

Other names for tree nuts are:

- Anacardium nuts
- Mandelonas (e.g. peanuts that have been altered to look and taste like tree nuts)
- Marzipan (almond paste)
- Nu-Nuts ™ (e.g. peanuts that have been altered to look and taste like tree nuts)
- Nut meats
- Pinon

The common sources of foods containing tree nuts are:

- Artificial nuts (peanuts altered to look and taste like almonds, pecans and walnuts) Baked goods (cakes, cereal bars, cookies, doughnuts, energy/granola bars, muffins, pastries)
- Baking mixes, cereals, crackers, muesli
- Coffee grinders
- Dressings/gravies
- Chinese food
- Gianduja (chocolate and chopped nuts mixture found in premium or imported chocolate and ice cream)
- Ice cream/frozen desserts/frozen yogurts/sundae toppings
- Natural flavorings and extracts
- Nut butter
- Nut-flavored coffee/liqueurs
- Sauces (barbeque, pesto, Worcestershire)
- Salads (Waldorf salad, curried chicken)
- Spreads (almond paste, cheese, chocolate nut, nougat, Nutella)
- Trail mixes

The non-food sources of tree nuts are:

- Hacky sacks
- Bird seed
- Cosmetics, hair care products, lotions
- Pet food

Milk Allergy

Lactose (milk sugar) intolerance is the most common form of milk allergy or adverse reaction to cow, goat and sheep's milk. Lactose needs to be broken down by an enzyme called lactase to be absorbed in the body, but some people do not produce enough lactase for this to happen. The digestive system cannot cope with raw lactose, so it reacts against it with symptoms such as stomach pain, bloating, vomiting and diarrhea.[27]

For others a milk allergy is a reaction to milk proteins such as casein that can be very difficult for humans to digest. Alternatively, the digestive system may not be functioning correctly and partially digested proteins may be crossing the stomach wall and causing an adverse immune reaction, contributing to a host of symptoms, and/or aggravating others.

As with a wheat allergy, milk allergies are often not immediate but the milk allergy symptoms can still be severe. It is also important to note that those with a milk allergy often have allergic reactions to goat's and sheep's milk, although this is not always the case. Depending on the degree of sensitivity, the patient may be able to tolerate sheep's or goat's milk products as the protein structures are easier to digest.

If any of the following items listed as an ingredient in a food, it will not be milk-free:

- Milk
- Lactic acid
- Milk protein
- Casein
- Nougat
- Milk solids
- Whey powder/protein
- Albumin
- Whey syrup
- Rennet
- Lactose (milk sugar)
- Curds
- Yogurt
- Caseinates
- Lactoglobulins

Foods that contain dairy produces are:

- Cheeses
- Butter & butter-like spreads
- Skim milk
- Evaporated milk
- Bakery foods such as cakes, buns, pastries, biscuits, etc.
- Chocolate
- Instant pudding mixes
- Salad dressings
- Sweets
- Ice cream
- Butter & Cream sauces
- Margarine
- Whole milk
- Instant desserts
- Baking powder
- Condensed milk
- Creamed foods
- Yorkshire pudding
- Custard
- Cake toppings
- Cream
- Powder/Dried milk
- Scrambled eggs
- Cake mixes
- Junket
- Mashed potato

There are many alternatives to milk and other dairy products readily available from supermarkets and health food shops. Some alternatives to dairy products are:

- Rice Milk
    - Good as a drink on it's own and for cereals, smoothies, and baking brands: Rice Dream or other, available unsweetened or sweetened.

- Oat Milk
    - Oat milk is a milk alternative, and although it is made from oats, it is lactose, GMO, gluten and cholesterol free
    - High in calcium, light and creamy and can be used just like milk
    - Good as a drink, on cereals and for baking, also available is an oat milk based 'ice cream'

- Almond Milk / Hazelnut Milk
    - Good for cereals, smoothies, hot drinks and baking
    - Some brands may have wheat maltodextrin added so read labels carefully if also avoiding wheat. Non-wheat maltodextrin is gluten free.

- Coconut Milk
    - Good in smoothies and sauces, especially curries
    - Can be diluted with water to reduce the fat content

- Soy Milk - also yogurt

  Soy is an unusual kind of protein which contains phytates, which is hard to digest (except the fermented forms of tempeh or miso) and can impair digestion and absorption, depress thyroid function and interfere with mineral absorption. It can also raise estrogen levels in the body.

    - Soy yogurt is a better option as it contains live beneficial bacteria
    - Frozen soy desserts ('ice creams') are also available

        - Brands: 8th Continent, Silk, Soy Dream and others

- Goat's Milk - also yogurt and cheese
    - More easily digested than cow's milk
    - There are many types of goat's milk cheeses including cheddar, brie and parmesan (pecorino) and feta available from supermarkets.
    - Goats milk butter is now available from some supermarkets

- Sheep's Milk yogurt and cheese
    - Sheep's milk is higher in calcium than cow's milk
    - Natural live sheep's milk yogurt and a variety of cheeses (including the above) are available from supermarkets

Calcium

Many people worry that they will be short of calcium if they do not drink milk or eat enough dairy products. However, the calcium in many other foods can be easy to digest and absorb particularly where the food also contains magnesium which is needed for using calcium in the body. Countries where little dairy produce is eaten, such as China, have very small percentages of osteoporosis, so it is possible to eat a balanced diet without dairy sources.

Non dairy sources of calcium include:

- Canned sardines
- Canned pink salmon
- Tofu
- Kidney beans (cooked)
- Blackberries
- Sunflower seeds
- Pumpkin seeds
- Green Leafy Vegetables
- Almonds
- Nut milks
- Seaweeds
- Enriched soy milk
- Spinach (cooked)
- Broccoli
- Lentils (cooked)
- Pears
- Kale
- Cauliflower
- Melon
- Swede
- Oat milk
- Pilchards
- Leeks
- Cabbage
- Watercress
- Carrots
- Dates and raisins
- Apples
- Green beans
- Kiwi fruit
- Tempeh
- Hazelnuts
- Baked beans

Egg Allergy

Egg allergy is usually mild, but in rare cases can trigger anaphylaxis. Food labels must be thoroughly scrutinized for products containing egg or albumen. The emulsifier known as lecithin can be derived from egg, although in practice this is uncommon. A partial list of egg ingredients that may contain egg protein appears below.[28]

Some egg-allergic children can eat well-cooked egg (in cake, for example) without experiencing any food allergy symptoms - but not raw or lightly cooked egg. Others are allergic even to egg which has been well cooked.

The MMR injection is normally cultured on egg. Anaphylactic reactions to the MMR have been reported, but they are very rare. In any case, it's probable that in those instances, a component other than egg was responsible. If there are any concerns, the vaccination should be given to the child as an outpatient in a

pediatric department with full resuscitation equipment available. Normally a test dose is given before the full dose.

Common sources that may include eggs:

- Baby food
- Baked goods
- Bouillon/consomme
- Candy *(nougat, white chocolate)*
- Cosmetics, hygiene products
- Ice cream
- Mayonnaise
- Meringue
- Pasta
- Processed meat
- Salad dressings *(Caesar)*
- Sauces *(hollandaise, béarnaise, newburg)*
- Specialty coffee
- White wine
- Egg washes are often used on bakery goods to make them look shiny? Eggs are often used in glazes and icing too.

Fish Allergies

Fish allergies may be one of the easiest to avoid. However, they can cause the most serious allergic reactions and fish allergies are usually lifelong. The initial allergic reaction most often occurs during adulthood. The protein in the flesh of fish is what most commonly causes the allergic reaction; however it is also possible to have an allergic reaction to fish gelatin, made from the skin and bones of fish. Although fish oil does not contain protein from the fish from which it was extracted, it is likely to be contaminated with small molecules of protein and therefore should be avoided.[29]

If one has an allergy to a specific type of fish, it does not necessarily mean they will be allergic to all types of fish. If there is a risk of a severe anaphylactic reaction it is better to avoid all fish – this can be discussed with your doctor. It is important to note that fish and shellfish are not related in terms of families of foods and that having an allergy to one does not mean one will have a food allergy to the other.

Shellfish Allergy

Like fish, shellfish allergies may be one of the easiest to avoid. However, they can cause the most serious allergic reactions and the allergies are usually lifelong. The initial allergic reaction to shellfish most often occurs during adulthood. The protein in the flesh of shellfish is what most commonly causes the allergic reaction; however it is also possible to have an allergic reaction to shellfish gelatin, made from the skin and bones of shellfish.[30]

Unlike fish, if a person is allergic to shellfish, they usually must avoid all types of shellfish, as most types will cause an allergic reaction. This includes all species of crab, lobster, shrimp, prawn, and all types of mollusks (clams, mussels and scallops).

There are not many foods where shellfish is a hidden ingredient. Cross contamination can occur and it is imperative to be more aware when eating out at restaurants.

Foods that may contain fish and shellfish:

- Caesar salad dressing
- Omega-3 supplements
- Chili
- Prepared meals
- Any food containing gelatin (check source

The common names of fish products are:

- Crustaceans
- Crab
- Lobster
- Shrimp
- Prawn
- Scampi
- Crawfish (crayfish)
- Mollusks
- Abalone
- Clams
- Conch
- Mussels
- Oysters
- Scallops
- Octopus
- Squid
- Calamari
- Escargot (snail)
- Quahog

The common sources of foods containing fish are:

- Asian sauces and dishes (egg rolls etc)
- Sushi
- Sashimi
- Tempura
- Thai food
- Chinese food
- Japanese food
- Vietnamese food
- Fish sauce
- Fish soup
- Fish balls
- Shrimp balls, noodles, chips
- Shrimp salad roll
- Prawn chips
- Haw Gow
- Sui My
- Taro Cake
- Daikon cake
- Fish/shellfish flavoring
- Stuffing (check labels)
- Worcestershire sauce

Soy Allergy

Soy beans belong to the legume family and have an almost identical protein structure to peanut. However a person will not necessarily be allergic to peanut if they have an allergic reaction to soy and vice versa.[31]

Symptoms of a soy allergy include asthma, rhinitis (stuffy nose), hives (urticaria), eczema, tissue swelling and digestive disturbances. In infants a soy allergy can cause diarrhea, vomiting, abdominal pain, crying, and a tendency to gain very little weight. Symptoms of soy allergy often present as similar symptoms to a milk allergy.

Soy is used in many processed foods. Products that say high protein often contain soy flour or other soy derivatives. Soy oil and soy lecithin are the two most commonly used soy products in processed food and thankfully they do not usually cause allergic reactions in children (the soy protein that causes the allergic reaction has been removed.)

The common names of soy products are:

- Edamame
- Miso
- Natto
- Shoyu
- Tamari
- Tempeh
- Texturized vegetable protein (TVP)
- Tofu
- Soy milk
- Soy sauce
- Soy nuts

- Soy grits
- Soy protein
- Soy protein isolate
- Soybean paste / curd
- Miso
- Sobee
- Kyodofu (freeze-dried tofu)
- Soy sprouts
- Soy flour

These ingredients may contain soy if the source has not been specified:

- Bulking agent
- Emulsifier
- Guar gum
- Gum Arabic
- Hydrolyzed vegetable protein (HVP)
- Hydrolyzed plant protein (HPP)
- Lecithin
- Protein filler / extender
- Mono- & di-glycerides
- MSG (monosodium glutamate)
- Seasoned salt
- Shortenings
- Stabilizer
- Thickener
- Vegetable gum / starch / oil / protein

The common sources of foods containing soy:

- Baby food
- Canned fish
- Chocolates (creamed centres)
- Cooking oils
- High protein bars / foods
- Ice cream/frozen desserts
- Dessert mixes
- Margarine
- Mayonnaise
- Meat products
- Powdered meal replacers
- Sauces (asian, gravy, soy, Worcestershire)
- Shortenings
- Soy/tofu cheese
- Soy yogurt
- Baked goods
- Breakfast cereals (mixed grain/multi grain)
- Infant cereals
- High protein flour and bread
- Stuffings
- Mixed sprouts
- Salad sprouts
- Salad dressings
- Canned soup/dried soup mixes
- Vegetarian meat replacers
- Frozen dinners
- Mixed bean preparation
- Prepared sauces eg. Barbecue, oriental etc.
- Chocolate

Wheat Allergy

Some researchers do not include celiac disease as a food allergy because this abnormal immune system response, does not involve IgE antibody. Wheat allergy occurs when there is an allergic reaction to gluten (the protein found in wheat, rye, barley and oats). Gluten refers to a group of proteins that are difficult for humans to digest. One group of proteins called gliadin is thought to do most of the damage to the intestinal lining. Glutenins are another group of proteins found in gluten and thought to be associated with autoimmune skin diseases and asthma. Gluten proteins are extremely resistant to intestinal digestion, despite grinding, cooking, processing and digestion.[32]

Gluten causes damage to the intestinal lining by eroding the villi and microvilli essential for digestion and absorption processes. This damage then increases the likelihood of partially digested gluten proteins passing into the bloodstream. Certain proteins cause our immune systems to react. Undigested partial proteins found in gluten cereals have morphine-like properties once they enter the bloodstream, suggesting an origin for the phrase 'comfort foods' and its addictive nature. Once an immune response has been initiated, inflammatory reactions can cause a whole host of wheat allergy symptoms. A gluten/wheat

allergy may not always be a severe frequent reaction but can result in many digestive symptoms – flatulence, bloating, constipation, diarrhea, pain etc. – and may aggravate a host of other symptoms:

- Tiredness
- Sweating
- Arthritis
- Skin rashes
- Headaches
- Eczema
- Cramps
- Migraines
- Anxiety
- Acne and boils
- Psoriasis
- Depression

Wheat is more likely to cause an allergic reaction than any other grain. Modern wheat has been developed to contain higher gluten levels for the manufacture of bread and other products, and our digestive systems were not designed to cope with the indigestible proteins. Some people with a wheat allergy find they can tolerate oats, however it is important to note that oats are often processed and stored alongside other grains.

The common names of wheat and gluten containing products are:

- Gluten / Vital Gluten
- Durum wheat
- Triticale (wheat and rye blend)
- White flour
- All-purpose flour
- Wholewheat flour
- Semolina (refined durum flour)
- Couscous (cracked wheat)
- Kamut
- Spelt
- Graham flourBulgar (partially cooked and toasted cracked wheat)
- Wholemeal flour
- Plain and self-raising flour
- Barley (extract, flavour, flour, malt)
- Farro
- Farina
- Polenta

Wheat can be found in many food products in different forms, these include:

- Food starch
- Starch / modified starch
- Corn starch
- Food starch
- Special edible starch
- Cereal filler / extract
- Cereal binders
- Cereal protein
- Cereal starch
- Edible starch
- Wheat protein
- Wheat starch
- Wheat berries
- Wheat bran
- Wheatmeal
- Thickening agent / thickener
- Hydrolyzed vegetable protein (HVP)
- MSG
- Binder
- Rusk

The common sources of foods containing wheat are:

- Bread – pitta, Chapatiis and naan bread
- Most kinds of rye bread (unless states 100% rye)
- BAKED GOODS - Cookies, Pastries, Buns, scones, cakes, muffins
- Pizza
- Battered or breaded products
- Pastas
- Baking powder
- Packet sauce mixes
- Seasonings
- Dressings and sauces
- Condiments
- Vinegar (if derived from wheat grains)
- Tinned soups
- Most breakfast cereals
- Some rye crispbreads
- Crumpets, pancakes (buckwheat pancakes unless states 100% buckwheat)

- Pies
- Sausages
- Ice cream
- Taramasalata (contains breadcrumbs)
- Mustards and mayonnaise (check labels)
- Stock cubes
- Beer, vodka, gin
- Soy sauce
- Ready-made foods, sauces
- Most muesli's
- Candy

Some alternatives to wheat include:

- CORN: flour, pasta, cornflakes, crispbread, chips, polenta, bread, nachos, tortillas, popcorn. - corn flour is one of the best thickening agents (ensure the corn flour is 100% corn flours with no added wheat flour)
    - Cornmeal can be prepared as polenta

- MILLET: flour, pasta, flakes
    - Millet grains are boiled as rice and are very nutritious – good in soups and casseroles
    - Millet flakes are great for making your own muesli

- BUCKWHEAT: also called 'kasha' - flour, pasta
    - Despite it's name, buckwheat is NOT related to wheat at all
    - Buckwheat oats are also great for making your own muesli
    - Japanese soba noodles are made from buckwheat (check labels on supermarket brands)
    - Buckwheat flour is useful for making blinis, pancakes and other baking recipes. (check label to ensure it is 100% buckwheat)

- RICE: flour, pasta, flakes, cakes, bread
    - Basmati or brown rice is best

- QUINOA (pronounced 'keen-wa'): flour, flakes, pasta, quinoa puffs
    - A 'complete' protein, very nutritious – can be called the perfect food
    - Quinoa grains are boiled as rice
    - Can be used as an alternative to couscous

- AMARANTH, TAPIOCA (from the cassava plant), ARROWROOT, GRAM FLOUR (from chickpeas), LENTIL FLOUR
    - Useful for thickening agents
    - Gram flour can be used to make wheat free popadums.

If the patient can tolerate oats, rye, and barley then the following may be options to explore:

- OATS: oatmeal, flour, oatcakes
    - Oats make a great breakfast, raw with fruit and chopped nuts
    - Oatcakes are a good substitute for crackers

- RYE: bread, flour, crispbread
    - Ensure bread and crispbread are 100% rye by checking labels

- BARLEY: flour useful for pancakes.

Spelt Allergy

Spelt is an ancient grain related to wheat that was used as a staple food in early Europe. However spelt is now being cultivated again. It is more nutritious than wheat, but still contains gluten (a protein found in wheat.) Compared to wheat though, it is more easily digestible, rich in complex carbohydrates and fiber, and has higher protein content than wheat. Some people with wheat intolerance can tolerate spelt, but it is best avoided during the initial stages of wheat free diet.[33]

Management of Food Allergy and the Dietician's Role

The Dietician plays a critical role in helping patients manage food allergy. The patient must successfully avoid food allergens while maintaining both nutritional adequacy and quality of life. Reading food labels is challenging for some consumers, as the names of some ingredients that contain allergic proteins may be unfamiliar to the average person.

The international Food Information Council Foundation recommends that the dietician communicate with PCP/allergist to understand diagnosis and needed dietary restriction. [34]

Provide education and practical strategies for the allergic individual, related to:

- Foods and ingredients to be avoided
- Reading labels, including ingredient list and "contains" statements
- Communicating with restaurants and other food preparers
- Consuming a nutritionally adequate diet, particularly with needed elimination of an entire food group, and with Celiac disease due to malabsorption.
- Adjusting infant feeding choices as necessary
- Monitor for signs of diet insufficiency or malnutrition

Dieticians working in schools have a leadership role in guiding school personnel, parents, and students in development of a program to effectively manage food allergies, including reducing risk of exposure, education and emergency response.

Section VI: Federal Government Regulations

Federal Government Regulations

As originally enacted in 1938, section 403(i) of the Federal Food, Drug, and Cosmetic Act required that the label of a food that is fabricated from two or more ingredients declare each ingredient by its common or usual name (except that spices, flavorings, and colors could be declared as a class.) Although ingredient declarations complying with section 403(i) provide some information to food allergic consumers, in some cases, the common or usual name of an ingredient may be unfamiliar to consumers and many consumers do not recognize that certain ingredients contain or are derived from a food allergen. This situation led, at least in part, to the enactment of the Food Allergen Labeling and Consumer Protection Act of 2004 (FALCPA) (Pub. L. 108-282).[35]

Food Allergen Labeling and Consumer Protection Act of 2004 (FALCPA)

The Food Allergen Labeling and Consumer Protection Act of 2004 (FALCPA) (Public Law 108-282) was enacted in August 2004, and addresses, among other issues, the labeling of foods that contain certain food allergens. All packaged foods regulated under the Federal Food, Drug, and Cosmetic Act (FFD&C Act) that are labeled on or after January 1, 2006, must comply with FALCPA's food allergen labeling requirements. FALCPA does not require any action with respect to products labeled before January 1, 2006.

.Under FALCPA, a "major food allergen" is an ingredient that is one of the following five foods or from one of the following three food groups or is an ingredient that contains protein derived from one of the following:

1. Milk
2. Egg
3. Fish
4. Crustacean shellfish
5. Tree nuts
6. Wheat
7. Peanuts
8. Soybeans

Congress designated these eight foods or food groups as "major food allergens." These foods or food groups account for 90 percent of all food allergies. Although there are other foods to which sensitive individuals may react, the labels of packaged foods containing these other allergens are not required to be in compliance with FALCPA.

FALCPA requires that in the case of tree nuts, the specific type of nut must be declared (e.g., almonds, pecans, or walnuts). The species must be declared for fish (e.g., bass, flounder, or cod) and Crustacean shellfish (crab, lobster, or shrimp).

FALCPA's requirements apply to all packaged foods sold in the U.S. that are regulated under the Federal Food, Drug, & Cosmetic Act, including both domestically manufactured and imported foods. FDA regulates all foods except meat products, poultry products, and egg products.

Raw agricultural commodities such as fresh fruits and vegetables in their natural state are not affected by FALCPA.

"Soybean," "soy," and "soya" are reasonable synonyms for the common or usual name "soybeans," and any one of these terms may be used to identify the food source of the major food allergen "soybeans." Packaged foods that are made using soybeans as an ingredient or as a component of a multi-component ingredient (e.g., soy sauce or tofu) should continue to use the word "soybeans" as the appropriate common or usual name for this ingredient to identify properly the ingredient (e.g., "soy sauce (water, wheat, soybeans, salt)").

FDA believes that "peanut" is an acceptable substitute for "peanuts" and that the names of the different types of tree nuts may be expressed in either the singular or plural form for the purpose of satisfying the FALCPA labeling requirements.

Food Label “May Contain”

If a "Contains" statement is used on a food label, the statement must include the names of the food sources of all major food allergens used as ingredients in the packaged food. For example, if "sodium caseinate," "whey," "egg yolks," and "natural peanut flavor" are declared in a product's ingredients list, any "Contains" statement appearing on the label immediately after or adjacent to that statement is required to identify all three sources of the major food allergens present (e.g., "Contains milk, egg, peanuts") in the same type (i.e., print or font) size as that used for the ingredient list.

The wording for a "Contains" statement may be limited to just stating the word "Contains" followed by the names of the food sources of all major food allergens that either are or are contained in ingredients

used to make the packaged product. Alternatively, additional wording may be used for a "Contains" statement to more accurately describe the presence of any major food allergens, provided that the following three conditions are met:

The word "Contains" with a capital "C" must be the first word used to begin a "Contains" statement. (The use of bolded text and punctuation within a "Contains" statement is optional.)

The names of the food sources of the major food allergens declared on the food label must be the same as those specified in the FALCPA, except that the names of food sources may be expressed using singular terms versus plural terms (e.g., walnut versus walnuts) and the synonyms "soy" and "soya" may be substituted for the food source name "soybeans."

If included on a food label, the "Contains" statement must identify the names of the food sources for all major food allergens that either are in the food or are contained in ingredients of the food.

Federal Food Drug and Cosmetic Act

A company and its management may be subject to civil sanctions, criminal penalties, or both under the Federal Food, Drug, and Cosmetic Act if one of its packaged food products does not comply with the FALCPA labeling requirements. FDA may also request seizure of food products where the label of the product does not conform to FALCPA's requirements. In addition, FDA is likely to request that a food product containing an undeclared allergen be recalled by the manufacturer or distributor.

FALCPA does not address the use of advisory labeling, including statements describing the potential presence of unintentional ingredients in food products resulting from the food manufacturing process. FALCPA does require FDA to submit a report to Congress, a part of which assesses the use of, and consumer preferences about, advisory labeling. In earlier guidance, FDA advised that advisory labeling such as "may contain [allergen]" should not be used as a substitute for adherence to current Good Manufacturing Practices (cGMPs). In addition, any advisory statement such as "may contain [allergen]" must be truthful and not misleading.

FALCPA does not require FDA to establish a threshold level for any food allergen. It is not unlikely, however, that FDA will at some point need to consider a threshold level for one or more food allergens in the context of reviewing a petition or a notification submitted to request that an ingredient be exempt from FALCPA's labeling requirements.

Section VII: Food Allergy Awareness

Allergy Awareness

An increasing number of children have developed allergies to peanuts and other common foods. According to the American Academy of Allergy Asthma and Immunology, peanut allergies in children increased twofold from 1997 to 2002. Some studies suggest about four percent of the U.S. population - more than 11 million people - have food allergies. Ten years ago, that figure was believed to be only one percent. [36]

But some researchers say an increasing awareness is causing a spike in reports of allergies. Other scientists believe the reason for the increase lies in the way peanuts are prepared. Still others believe children are exposed to too few allergens in their youth.

A growing body of research finds that children raised in clean, urban settings are more likely to develop allergies than children raised in rural areas or farming communities. The "hygiene hypothesis" holds that children exposed to allergens and microbes at an early age develop a greater tolerance for those allergens, and are therefore less likely to suffer from allergies.

The hygiene hypothesis is questionable. It is generally regarded as intriguing but controversial. For every example, you can find other examples where it's not so. And proponents of this hypothesis risk ignoring the important point that infections used to kill many more people than allergies.

Parents and doctors alike are increasingly aware of food allergies. But is this awareness fueling the statistical increase in reported allergies more than any actual increase in allergies?

There is no clear evidence for the increase in number of children allergic to peanuts. There is definitely increased awareness.

High Risk Infants and Children

If one parent has food allergies, the risk of the children having food allergies may double; the risks are even higher if both parents are allergic. Yet, a child may have a completely different food allergy than that of the parent. The following prevention regimen can lower the child's risk by around fifty percent reports The American College of Allergy, Asthma and Immunology.[37]

- Prevent allergies prenatally**.**

  Some studies suggest that mothers who are allergic to certain foods, especially dairy products, can lessen the chances of their infants being allergic to that food by limiting the child's exposure prenatally. Avoid bingeing on common allergens during pregnancy and while breastfeeding.

- Breastfeed as long as possible**.**

  The longer the infant is breastfed, the less chance the child has of developing allergic diseases, such as eczema and asthma. Breast milk is rich in an immunoglobulin called secretary IGA, which acts as a protective paint, coating the intestines and keeping food allergens out of the bloodstream. Breast milk keeps the intestinal lining healthy and better able to break down proteins into individual amino acids. The amino acids themselves are not likely to cause allergies when they get into the bloodstream. Intestines that are damaged due to infection or inflamed by foreign milk or formula may allow whole protein molecules to seep through, setting up an allergic reaction in the bloodstream. To further decrease the risk of developing food allergies, it would be wise for a breastfeeding mother to keep the most allergenic foods out of her diet until her baby is at least one year of age.

- Delay introduction of solid foods

  Mature intestines are better able to screen out potential allergens and keep them from entering the bloodstream. If an infant is fed solid foods (especially those containing protein, such as wheat, soy, and dairy) before the intestinal lining is mature, food allergens can seep into the bloodstream, causing a build up of antibodies to those allergens and later allergic reactions to those foods. When solids are started, introduce the least allergic (lowest protein) foods first, such as fruits, vegetables, and rice. Wait until at least eighteen months before introducing potentially-allergic foods, such as egg whites, tomatoes, shellfish, and peanut butter. Make citrus fruits the last fruits that are introduced. Cow's milk products should be delayed until at least a year of age. By twelve months of age, a child's intestines are mature enough to screen out most of the food allergens.

- Variety

  The less children eat of one particular food, the less likely they will become allergic to it, since most food allergies are dose related. Children should eat a variety of foods. Continuing to bombard the body with the same food risks turning on the food- antibody response. Rotation diets make good sense for every eater, and especially for the allergic person.

  During the early years, diet should be as fresh and as additive-free as possible. The fewer cans, boxes, and packages, the less likely the child will be exposed to allergens. Food colorings, yellow dye #5 and red and blue dyes should be excluded.

Food allergy should also be considered as a potential cause of gastrointestinal or dermatological symptoms in patients. The eosinophilic gastrointestinal disorders (EGID) which may affect the esophagus, stomach, colon and rectum are mostly chronic and recurrent disorders that adversely impact quality of life for patients and families. Patients with EGID have a high rate of sensitization to food and environmental allergens, and many of them have a high rate of clinical symptoms with various food ingestions. A subset of patients respond to removal of major food allergens from their diet.

EGID management often requires multiple specialists, including the primary physician, allergy and immunology, gastroenterology, nutrition and psychology.

Research

An example of recent research of immune response for the therapy of allergies, a team at the Institute of Food Allergy Research in Norwich, England reported a molecule called interleukin-12 can protect against food allergies. Interleukin-12 is absent during the body's allergic response.[38]

They have identified a molecule that is very important for the regulation of immune response and for the first time clearly represents a potential target for the therapy of allergy. The molecule is made by white blood cells called dendrites. These cells help regulate the body's immune response to foreign materials, including food proteins. Researchers compared dendritic cells in the gut and spleen of mice with and without food allergies. Cells in the allergic mice did not make interleukin-12, the research team reported.

Section VIII: Case Studies

Food Allergy Case Studies

The Dietitian serves as a coach and a guide to the client offering support with change and helping to bridge the gap between old habits and foods into different habits and foods that help support the client with where they are in their health and life at the time.

Making changes is overwhelming and difficult for some clients. With the knowledge of the registered dietitian, the client is guided toward change using foods that may be similar to what they are used to. The dietitian can also offer the client a list of items that would be fitting for the clients needs based on their likes, dislikes and demographic area (what's available to the client).

Case Study #1: Deb J. - IBS

At 53 years old, Deb J. sought out the services of a registered dietitian. Her goals at the time were to lose weight and become more conditioned. She was battling the same 30 pounds for a span of about 30 years.

She had complained of constant pain and bloat in her abdomen. Her physician had said she had a slight case of Irritable Bowl Syndrome (IBS). Since IBS is such a broadly defined condition, it was necessary to start by incorporating some basic diet and lifestyle changes.

Since Deb's diet needed tweaking and there were no big dietary changes the first appointment was for an hour with a weekly session that ranged from 30 – 60 minutes, depending on the complexity and the questions or challenges from the client. With the help of a dietitian, Deb kept a general food log guide to track what was causing the irritation.

Deb's usual daily diet that was causing her IBS consisted of:

- Breakfast - Lucky Charms or a Slim Fast or nothing, then coffee at work and all morning.
- Lunch - A frozen entrée of some sort and maybe a piece of fruit
- Afternoon snack - Something from the vending machines, Doritos, pretzels or cookies. or if there was some candy at work then that would be the choice of the day
- Dinner - More red meat than chicken, turkey or fish, usually prepared with oils or butters and coupled by mashed potatoes made with dairy, a glass of milk and on occasion, a veggie.
- Evening snack - Usually ice cream or cookies

She started to decrease the total fat and more specifically the saturated fat in her diet. She went from 65 – 90 grams of fat each day to an average of 35 – 40 grams of fat per day. She increased her intake of omega-3 fatty acids through the addition of fish in her diet about twice a week as well as the addition of a flax seed supplement. This client was using a flax seed supplement in the form of a gel capsules by Barleans. She started with 3 capsules a day and eventually increased up to 9 capsules a day. This helped her with the inflammation. She is currently on 3 – 6 day depending on her own level of comfort. She would take more on days she exercised more heavily and less on days that she wasn't as physically active.

She increased her fiber intake from about 15gms gradually to 35gms a day because her satiety levels were poor. She was bloated and would experience bouts of hypoglycemia. Increasing her fiber intake helped level out her blood sugar levels. She was struggling with being hungry often before starting to clean her diet up. Since she wasn't taking in much fiber before, she needed to slowly get her level up.

Deb worked on developing some different stress relievers. She started incorporating more exercise and stretching and became more involved in leisure activities such as knitting and gardening. She increased her exercise in the morning to 15 –30 minutes of walking before work. She walked away from her desk while at work and would go into the bathroom and do 10 deep breathes and 'squats". She said this technique helped her calm down and just felt good to her body.

After working with these changes for several months, she was feeling better than she had. However, she still didn't feel great. She could definitely target that when she would have the occasional high fat food or entrée that she would experience bouts of diarrhea as well as abdominal cramping

At her 3-month follow-up, Deb decided she wanted to see what more she could do to help herself. At the suggestion of the dietitian, she decided to eliminate dairy and wheat products from her diet. The dietitian helped her develop a working plan with specific foods and plenty of variety to deal with this change.

Her new typical daily menu now consisted of:

- Breakfast – Oatmeal, buckwheat or brown rice cereal with soy or rice milk
- Lunch -Large salad with chicken or tuna and rice crackers
- Afternoon snack – Fruit and 6 almonds
- Dinner – shrimp, chicken, or turkey in the form of a stir-fry or baked with a vegetable and sometimes rice or potato

Deb had a difficult time at first, just because everything was new and she was so used to preparing specific things for her husband, so there were some emotional issues involved as well.

She was able to experiment with adding a dairy serving every now and again to see how her body would respond. She loves yogurt and cottage cheese, and was anxious to experiment with these items. At times her body can handle them and at other times rejects them and she will have cramping and diarrhea followed by headaches and fatigue.

This final change in her diet seemed to have made the most change in how she felt. Deb has been able to maintain this way of living now for the past 5 years. She ended up taking classes to become a Master Gardener. The program opened her world up to more social events with people who had similar passions. She also started volunteering at a Stray Cat Home. This is a place that takes baby, stray or abandoned kittens and gets them used to living with humans. She loves it!

Case Study #2: Lindsay M. - Celiac Disease

Lindsay M. is a 24 year old female. She had been experiencing painful bouts of cramping followed by diarrhea alternating with constipation. She went to see an Allergist and Gastroentologist and after a complete exam, was diagnosed as having celiac disease, an allergy to eggs and intolerance to lactose. After discovering this information, she sought out the services of a dietitian to help her manage her condition.

Lindsay was very overweight. She had been exercising and struggling with times of binging and purging through exercise.

Her new diet consisted of 35gms of fiber coming from lots of fruits and vegetables, oats and rice. She began using soy milk and other dairy alternatives. Because managing celiac disease can be challenging and overwhelming, she began making her own sauces to put on rice pasta and potatoes giving her complete control with ingredients. She ate very consistently for about four weeks and experienced much relief. She had regular and normal bowel movements, very little gas and bloating and decreased pain and tenderness in her abdomen.

Lindsay also started to exercise more regularly. She started walking, then taking some aerobics classes, followed by the addition of a weight routine and then running.

After four-weeks of consistency, Lindsay decided to experiment with the occasional wheat product, such as a large soft pretzel or regular pizza crust. She found that she was uncomfortable after eating those items, but nothing like the pain she experienced before.

As with most food allergies or intolerances, we all seem to have our own level of tolerance. The tolerance level can change, but generally people decide how much pain they want to endure in order to add things back into their diet.

Case Study #3: Nichole K. - Broad Range of Allergies

Nichole K is a 14 year old female. She began experiencing blotchy, itchy skin, abdominal distention and swelling of skin on some areas of the body. She had a difficult time connecting which substances gave her the discomfort.

After an Allergist did a series of prick skin tests and skin graphs, she was told that she was allergic to oats, beef, shellfish and hops. Her family decided to seek the help of a dietitian that met with Nichole once a week for four months.

It just so happens that her family prepared brats on a regular basis using beer. Her mother would prepare her oatmeal on most mornings and her family enjoyed seafood several times a week. Since she was exposed to these items on a regular basis, it was difficult to see what would be causing her discomfort.

Nichole decided to eliminate the offending food items all together as the reaction she had from those items was so uncomfortable she did not want to test out her tolerance levels right away. After replacing the items above, her conditions improved. She was also experiencing asthma and that too improved.

Nichole continues to watch for these interactions when she is out with friends or in other social settings where others are unaware of her allergies. She is able to identify more clearly if she has an allergic reaction to an item. On occasion, this continues to happen due to servers not knowing what is in a product, mislabeling on packaged items, and from cross contamination in restaurants.

Section IX. Additional Resources

Links to organizations found at this site are provided solely as a service. Links do not constitute an endorsement of these organizations or their programs by Vantage Professional Education (VPE), and none should be inferred. VPE is not responsible for the content of the individual organizations' Web pages found at these links.

The American Academy of Allergy, Asthma and Immunology
555 E Wells St Ste 1100
Milwaukee, WI 53202-3823
http://www.aafa.org

The Academy of Nutrition and Dietetics
120 South Riverside Plaza, Suite 2000
Chicago, IL 60606-6995
312/899-0040
http://www.eatright.org

Food Allergy and Anaphylaxsis Network
11781 Lee Jackson Hwy F160
Fairfax, VA 22033-3309
800-929-4040
http://www.foodallergy.org

Kids With Food Allergies
73 Old Dublin Pike Ste 10 #163
Doylestown, Pa 18901
215-230-5394
http://Kidswithfoodallergies.org

National Center for Health Statistics'
Division of Data Services
3311 Toledo Road
Hyattsville, MD 20782
301-458-4636
http://www.nutrition.gov

Section X. Continuing Education Answer Sheet & Test Questions

Dietitians: RD, CDE, LDN, DTR. Approved for **5 CPE credits.** VPE (Provider Number VA002) is a CPE Accredited Provider with the *CDR.*
Course Expiration Date: 04/24/13.

We will mail you a Certificate of Completion for your Activity Log for the CDR reporting.

(#094998) Food Allergies Guide for Dietitians

Guarantee: **We guarantee our Continuing Education Certificates. If for any reason your state does not accept our Continuing Education Credits, we will refund the amount paid by the student for the Certificate. A grade of 70% or better is required to pass this test.**

Payment	Total
Credits Per Credit 5 x $9.50	$ 47.50
Make Check Payable to: VPE	

Mail Answer Sheet & Payment:

Ms. Angela Turton, Registrar
Vantage Professional Education
P.O. Box 172835
Tampa, FL 33672

ANSWER SECTION									
	a	b	c	d		a	b	c	d
1	○	○	○	○	9	○	○	○	○
2	○	○	○	○	10	○	○	○	○
3	○	○	○	○	11	○	○	○	○
4	○	○	○	○	12	○	○	○	○
5	○	○	○	○	13	○	○	○	○
6	○	○	○	○	14	○	○	○	○
7	○	○	○	○	15	○	○	○	○
8	○	○	○	○	16	○	○	○	○

Print Name _____
Address _____
City _____
State _____ Zip _____
Name of Employer _____
Phone Day (____)_____-_____

E-mail _____

AND/CDR Lic# (Required) _____ Florida # _____
Dietitian: O RD O DTR O LDN Other_____
Time Required to Complete this Course?_____

Content Evaluation	**Disagree**				**Agree**
1. Relationship of objectives appropriate to meet the goals of activity?	1	2	3	4	5
2. Effective as a learning resource?	1	2	3	4	5
3. Extended my knowledge on the topic?	1	2	3	4	5
4. Was consistant with the objectives?	1	2	3	4	5
5. Was related to my job?	1	2	3	4	5

Course Objectives Evaluation: Did the course content meet the stated objectives?	**Disagree**				**Agree**
1. Distinguish food allergy from adverse food reactions	1	2	3	4	5
2. Identify the main food allergens and their prevalence	1	2	3	4	5
3. Understand food allergy symptoms, testing, and management	1	2	3	4	5
4. Describe clinical cross-reactivity	1	2	3	4	5
5. Understand the Food Allergen Labeling and Consumer Protection Act of 2004 (FALCPA)	1	2	3	4	5
6. Identify high risk situations for allergic patients	1	2	3	4	5
7. Understand food allergy awareness	1	2	3	4	5

A Guide to Food Allergies (#086907)

16 Test Questions: Please use the Answer Sheet

Dietitians: RD, CDE, LD/LCN, DTR.
This offering is approved for **5 Continuing Professional Education Credits** by the Commission on Dietetic Registration (CDR).

1. Why are food allergy and food intolerance easily confused?

a. They both involve the immune system
b. They both usually present only in infants
c. They have similar symptoms
d. True food allergies always affect the lungs

2. Which of the following in high concentrations may cause severe problems for people that are asthmatic?

a. Sulfites
b. MSG
c. Red meat
d. Gluten

3. Which of the following defines "food aversion?"

a. The patient is psychologically convinced that they are food allergic
b. The patient has been diagnosed with an ulcer of the GI tract
c. The patient has been diagnosed bulimia
d. The patient has abdominal pain made worse by eating

4. How many Americans does the CDC report to have food allergies?

a. 2 million
b. 6 million
c. 12 million
d. 50 million

5. What is the most common food allergy reported by the CDC?

a. Peanuts
b. Seafood
c. Tree nuts
d. Gluten

6. What percentage of adults with food allergies become clinically non-reactive to the offending food over a 2 year elimination period?

a. 5%
b. 30%
c. 60%
d. 90%

7. Which of the following is a food allergy that is not likely to "resolve"?

a. Peanut
b. Milk
c. Soy
d. Egg

8. In which of the following are food allergies most likely to manifest?

a. Upper respiratory tract
b. Lower respiratory tract
c. Skin
d. GI tract

9. Which food allergy is the most common cause of fatal food related anaphylaxis?

a. Fish
b. Soy
c. Peanut
d. Egg

10. Which of the following food allergy testing method is the most accurate?

a. Serum IGE concentration
b. Radioallergosorbent Test
c. Prick Skin Test
d. Double Bind Placebo-controlled Food Challenge

11. How has the amount of peanut allergies changed over the last 5 to 10 years?

a. Increased
b. Decreased
c. Remained the same
d. Increased only in males

12. Which grain is more likely to cause an allergic reaction?

a. Rye
b. Barley
c. Oats
d. Wheat

13. What percent of all food allergies does the eight "major food allergens" designated by Congress account for?

a. 60%
b. 70%
c. 80%
d. 90%

14. What is the risk for a child of having food allergies if one parent has food allergies?

a. Doubles
b. Triples
c. No affect
d. Both parents must have a food allergy to affect the child.

15. What is the age a child's GI tract is mature enough to screen out most food allergens?

a. 3 months
b. 6 months
c. 9 months
d. 12 months

16. Which of the following best describes the theory that holds children exposed to allergens and microbes at an early age develop a greater tolerance for those allergens?

a. Infection hypothesis
b. Hygiene hypothesis
c. Interleukein-12 allergic response
d. EGID sensitization

Section XI. Footnotes

[1] NIH Expert Panel Makes *Recommendations for Food Allergy Research* , National Institute of Allergy and Infectious Diseases [Website] Accessed December 5, 2007; http://www3.niaid.nih.gov/news/newsreleases/2007/FoodAllergyExpertPanel.htm
[2] Sicherer SH. *Manifestations of food allergy: Evaluation and Management. American Family Physician* 1999;59: [Website] Accessed January 6, 2008; http://www.aafp.org/afp/990115ap/415.html
[3] National Institute of Allergy and Infectious Diseases (NIAID), *National Institutes of Health. Report of the NIH Expert Panel on Food Allergy Research*. [Website] Accessed December 16, 2007; http://www3.niaid.nih.gov/healthscience/healthtopics/foodAllergy/ReportFoodAllergy.htm
[4] Food Allergy and Additive Intolerance. *An Overview for Health Workers, Surrey Allergy Clinic* [Website] Accessed November 22, 2007; http://www.allergy-clinic.co.uk/food_allergy_for_doctors.htm
[5] Mayo Clinic, *MSG is it Harmful?* [Website] Accessed January 14, 2008; http://www.mayoclinic.com/health/monosodium-glutamate/AN01251
[6] U.S. Department of Health and Human Services, National Institutes of Health National Institute of Allergy and Infectious Diseases Report of the Mayo Clinic, *Food Allergy, An Overview* [Website] Accessed Jan 2, 2008; http://www3.niadinih.gov/topics/foodallergy
[7] Surrey Allergy Clinic, *Food Allergy and Additive Intolerance. An Overview for Health Workers* [Website] Accessed November 22, 2007; http://www.allergy-clinic.co.uk/food_allergy_for_doctors.htm
[8] Kagan, Rhoda Sheryl, *Food Allergy: An Overview. Environmental Health Perspectives* [Website] Accessed Jan2, 2008; http://www.ehponline.org/members/2003/5702/5702.html.
[9] National Center for Chronic Disease Prevention and Health Promotion, *Food Allergies* [Website] Accessed January 15, 2008; http://www.cdc.gov/HealthyYouth/foodallergies/
[10] National Institute of Allergy and Infectious Disease, National Institutes of Health, *Report of the Expert Panel on Food Allergy Research* [Website] Accessed November 15, 2007; http://www3.niaid.nih.gov/about/organization/dait
[11] Mayo Clinic, *Food Allergies* [Website] Accessed November 14, 2007; http://www.mayoclinic.com/health/food-allergy/DS00082/DSECTION=3
[12] Zeiger RS. *Food allergen avoidance in the prevention of food allergy in infants and children*. Pediatrics 2003;111:1662-1671
[13]Sicherer SH. *Manifestations of food allergy: Evaluation and Management*. American Family Physician 1999;59: [Website] Accessed January 4, 2008 http://www.aafp.org/afp/990115ap/415.html.
[14] Goldhahn K, Dahlstrom J, McBride D, Madsen C. *The prevalence of food allergy: A meta-analysis*. J Allergy Clin Immunol. 2007. [Epub ahead of print] [Website] Accessed January 6, 2008; http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=ShowDetailView&TermToSearch=17628647&ordinalpos=10&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed
[15] Arkansas Center for Ear Nose Throat and Allergy, *Food allergy and Cross Reactivity* [Website] Accessed January 12, 2008 http://www.acenta.com/allergy.foodallergy.asp.
[16] Shellfish Allergy, The Food Allergy Initiative, *What Does it Mean?* [Website] Accessed Jan 3, 2008; http://www.foodallergyinitiative.org/section_home.cfm?section_id=3&sub_section_id=4
[17] Mayo Clinic, *Food Allergies* [Website] Accessed November 14, 2007; http://www.mayoclinic.com/health/food-allergy/DS00082/DSECTION
[18] National Institute of Allergy and Infectious Disease, National Institutes of Health, *Report of the Expert Panel on Food Allergy Research* [Website] Accessed November 15, 2007; http://www3.niaid.nih.gov/about/organization/dait
[19] Lee A and Newman JM. *Celiac diet: Its impact on quality of life*. J Academy of Nutrition and Dietetics. 2003;103:1533-1535
[20] The International Food Information Council, *Understanding Food Allergy A Primer for Dietitians* [Website] Accessed January 15, 2008; http://peopleconnection.aol.com/main/
[21] National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health, *Report of the NIH Expert Panel on Food Allergy Research* [Website] Accessed January 12, 2008; http://www3.niaid.nih.gov/healthscience/healthtopics/foodAllergy/ReportFoodAllergy.htm
[22] Kagan, Rhoda Sheryl, *Food Allergy: An Overview. Environmental Health Perspectives* [Website] Accessed Jan 2, 2008; http://www.ehponline.org/members/2003/5702/5702.html
[23] The Food Allergy Initiative, *The Food Allergy* [Website] Accessed Jan 3, 2008; http://www.foodallergyinitiative.org/section_home.cfm?section_id=3&sub_section_id=4
[24] National Institute of Allergy and Infectious Diseases, *New Food Allergy Research Consortium* [Website] Accessed January 2, 2008; http://www.foodallergyinitiative.org/section_home.cfm?section_id=3&sub_section_id=4

[25] The Food Allergy Initiative , Peanut Allergy [Website] Accessed January 2, 2008; http://www.foodallergyinitiative.org/section_home.cfm?section_id=15
[26] The Food Allergy Initiative, Tree Nut Allergy [Website] Accessed January 3, 2008; http://www.foodallergyinitiative.org/section_home.cfm?section_id=3&sub_section_id=6
[27] The Food Allergy Initiative, *Milk Allergy* [Website] Accessed January 2, 2008; http://www.foodallergyinitiative.org/section_home.cfm?section_id=3&sub_section_id=3
[28] The Food Allergy Initiative, *Egg Allergy* [Website] Accessed January 4, 2008. http://www.foodallergyinitiative.org/section_home.cfm?section_id=3&sub_section_id=2
[29] The Food Allergy Initiative, *Fish Allergy* [Website] Accessed January 2, 2008; http://www.foodallergyinitiative.org/section_home.cfm?section_id=15
[30] The Food Allergy Initiative, *Shellfish Allergy* [Website] Accessed January 2, 2008; http://www.foodallergyinitiative.org/section_home.cfm?section_id=3&sub_section_id=4
[31] The Food Allergy Initiative, *Soy Allergy* [Website] Accessed January 3, 2008; http://www.foodallergyinitiative.org/section_home.cfm?section_id=3&sub_section_id=7
[32] Lee A and Newman JM. *Celiac diet: Its impact on quality of life.* J Academy of Nutrition and Dietetics 2003;103:1533-1535
[33] The Food Allergy Initiative, *What About Spelt*? [Website] Accessed January 5, 2008; http://www.foodallergyinitiative.org/section_home.cfm?section_id=3&sub_section_id=5
[34] International Food information Council, *Understanding Food Allergy* [Website] Accessed December 15, 2007, http://www.ific.org/index.cfm
[35] U.S. Food and Drug Administration, Center for Food Safety and Applied Nutrition, *Food Allergen Labeling and Consumer Protection Act of 2004* [Website] Accessed December 2, 2007; http://www.cfsan.fda.gov/~dms/alrgacm
[36] Allergy and Asthma Advocate, *Major Advances in Peanut Allergy* [Website] Accessed January 5, 2008; http://www.aaaai.org/patients/advocate//fall/jaci.stm
[37] The American College of Allergy, Asthma and Immunology, *Food Allergy Risks* [Website] Accessed January 7, 2008; http://www.healthfinder.gov/news/newsstory.asp?docid=609892
[38] U.S. Department of Health and Human Services, *Scientists Spot Key Food Allergy Molecule* [Website] Accessed January 7, 2008; http://www.healthfinder.gov/news/newsstory.asp?docid=606085