Current Topics in Food Safety & Nutrition

FOOD Insight™

IFIC Foundation
http://ific.org

March / April 2008

Good Food, Good Flavor, Good Health:

Blending the benefits of flavor and health through herbs and spices

"A[n] herb is a friend of physicians and the praise of cooks."
Charlemagne, 9th century

With increasing interest in "functional foods" among scientists and health professionals, herbs and spices have been receiving greater attention for their potential to confer benefits beyond basic nutrition. Research suggests that some herbs or spices may aid in appetite suppression, increase insulin sensitivity or lipid metabolism, or reduce risk of cancer or Alzheimer's disease. Emerging potential health benefits of these conveyers of good taste are welcome news for "foodies," who have proclaimed the value of enjoying flavorful food, independent of nutritional benefits.

Herbs and spices have been used for centuries for culinary purposes and are the foundation of many traditional medicinal practices. "Old World" civilizations such as Egypt, Greece, and Rome established an international spice trade with Ethiopia dating back to 4500-1900 BC. Ancient Egyptians used garlic cloves to decorate their tombs, and relied on cinnamon and cardamom, among others, for spicing foods. Grecians noted the potential benefit of herbal remedies, including rosemary, for improving memory. Mint was touted as a digestive aide. In fact, the first plant monograph, or scholarly article, was published by a Greek physician and botanist.

Perhaps most recognized for their use of herbs and spices as medicinal elements are the peoples of China and Eastern India, some of whose traditional practices (such as homeopathy and Ayurveda) are now beginning to find their way into mainstream Western medicine. The food traditions of these cultures also make rich use of herbs and spices. Ginger, garlic, and red pepper are identified with traditional Chinese foods. Ginger, turmeric, garlic, and cumin are combined to make curry, an Indian food favorite.

Americans, perhaps now more than ever, are trying to balance their enjoyment of food with their health goals. The time is ripe to explore the science—and whet the appetite—about herbs and spices that can promote health. This article will focus primarily on capsaicin (found in red pepper), curcumin (found in turmeric), cinnamon, and ginger—herbs and spices of current interest for their potential health benefits.

Red Pepper (Capsaicin)

Eating hot red or chili peppers has been known to make people sweat. While pepper lovers may be seeking the thrill of the fire, they may also be receiving unexpected benefits. An increase in body temperature or heart rate upon ingestion of hot red pepper is believed to be an indicator of increased metabolic rate. In fact, research has shown that capsaicin

[continued on page 4]

INSIDE

Striking a Balance: Omega-6 and Omega-3 Fatty Acids

Although some consumers still view fats as something to avoid, the awareness that certain fats can have beneficial effects on health is starting to resound. Of the types of fats in food, saturated and *trans* fats are considered major contributors to heart disease, while polyunsaturated and monounsaturated fats play important roles in promoting heart health. Within the family of polyunsaturated fats, omega-6 and omega-3 fatty acids have earned a reputation as 'good' fats. When consumed in moderation to replace saturated and *trans* fatty acids, omega-6 and omega-3 fatty acids are well recognized as fats that can help reduce both blood cholesterol levels and risk for heart disease.

Recommended amounts of fats have evolved as scientists continue to gain better understanding of the diverse roles and effects of the different types of fatty acids. To meet the current total fat recommendation of 20 to 35 percent of calories, the 2005 *US Dietary Guidelines for Americans* advise that most dietary fats should come from sources of polyunsaturated and monounsaturated fatty acids. The Institute of Medicine's (IOM) Dietary Reference Intakes (DRIs) identify recommended daily amounts of omega-6 and omega-3 fatty acids (see table). The American Heart Association (AHA) bases their intake recommendations for omega-3 fatty acids on risk for coronary heart disease along with providing general guidelines for consuming foods with omega-6 fatty acids.

Scientists continue to delve deeper into the health effects of the different types of fatty acids. Ongoing study of optimal amounts of polyunsaturated fats in the diet has led to the premise that a balance of omega-6 and omega-3 fatty acids is necessary for maximizing the benefits of these fats. Some scientists believe that diets high in omega-6 fatty acids relative to omega-3 fatty acids may be associated with the increased prevalence of chronic diseases, including heart disease and certain cancers. This has led to the proposed use of a target intake ratio of omega-6/omega-3 fatty acids for assessing health risk and making dietary recommendations.

The ratio of omega-6/omega-3 fatty acids in today's diet is estimated to be more than 10:1, with some estimates as high as 30:1. A few studies suggest that a much lower ratio of omega-6 to omega-3 fatty acids, ranging between 2:1 and 5:1, is desirable in reducing the risk of disease, including heart disease, cancer, and autoimmune disorders. Yet, some nutrition scientists question the validity of a target ratio, arguing that use of a ratio as dietary advice for individuals is not only difficult to measure and implement, but there are flaws and limitations in applying a target ratio for assessing risk of disease. This article examines the ratio debate and presents the current consensus on omega-3 and omega-6 fatty acids.

Health Effects of Omega-6 and Omega-3 Fats

Unsaturated fatty acids can be classified as omega-6 or omega-3 based on their chemical structure. Both classes comprise a collection of several fatty acids, including two essential fatty acids that must be supplied by the diet because the body cannot produce them. These essential fatty acids are critical for normal growth and functioning of the cells, muscles, nerves, and organs.

The omega-3 fatty acids include the essential alpha-linolenic acid (ALA), which is primarily provided in the diet through plants, as well as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which are primarily provided from seafood. ALA is found mainly in flax, flaxseed oil, canola oil, walnuts, and dark green leafy vegetables. The body has the ability to convert ALA into EPA and DHA, however the efficiency of this conversion is low. Food sources of DHA and EPA include fatty fish, such as salmon, trout, sardines, mackerel, and cod.

In general, omega-3 fatty acids decrease serum triglyceride and total cholesterol levels, and may increase or have no effect on high-density-lipoprotein (HDL) cholesterol. In addition to lowering the risk of heart disease and stroke, omega-3 fatty acids may help reduce symptoms of hypertension, depression, joint pain and other rheumatoid problems. Other potential benefits may include reducing symptoms of attention deficit hyperactivity disorder (ADHD), boosting the immune system, and offering protection from an array of illnesses, including Alzheimer's disease. In young children, omega-3s also aid in neurological development.

The omega-6 fatty acids include the essential linoleic acid (LA) found mainly in corn and soybean oils, seeds and nuts. LA is converted in the body to arachidonic acid (AA), which also occurs naturally in meat, dairy, and eggs. Diets high in omega-6 fatty acids are associated with lower blood levels of total cholesterol and LDL-cholesterol, but also with lower blood levels of the protective HDL cholesterol.

(continued on page 3)

(continued from page 2)

Striking a Balance: Omega-6 and Omega-3 Fatty Acids

Sorting Out the Facts

Establishing a target ratio for intake of omega-6/omega-3 fatty acids may actually contradict current knowledge and may be based more on myth than fact.

MYTH: Americans don't consume omega-6 fatty acids in accordance with dietary recommendations.

FACT: Scientists believe that humans evolved on a diet that provided about equal amounts of omega-6 and omega-3 fats. Over time, agricultural and technological advances have made it possible to mass-produce vegetable oils and the use of these omega-6 rich oils has become more prevalent in the food supply. According to the National Health and Nutrition Examination Survey (NHANES) 2001-2002, mean usual intakes of both omega-6 and omega-3 fatty acids are close to recommended intake levels suggested by the IOM in the DRIs (see table). Furthermore, since both omega-6 and omega-3 fatty acids are essential in the diet, it may be preferable to use the absolute amounts of both fats rather than a ratio of the two when determining intake.

MYTH: Omega-6 fatty acids interfere with health benefits of omega-3 fatty acid consumption.

FACT: This belief is based on experimental evidence that omega-6 fatty acids compete with omega-3 fatty acids for common enzymes needed for metabolism, possibly counteracting the health benefits of omega-3 fatty acids. The potential significance of this theory requires understanding of the effects of eicosanoids, hormone-like end products of the metabolism of omega-6 and omega-3 fatty acids. The metabolism of omega-3 fatty acids produces eicosanoids that inhibit inflammation, blood clotting, arrhythmias, and help to lower blood pressure. In contrast, the metabolism of omega-6 fatty acids produces eicosanoids released in response to injury, infection, or disease that promote inflammation and blood clotting and increase blood pressure.

Mozaffarian et al examined the interplay between omega-6 and omega-3 fatty acids and coronary heart disease risk in the Health Professionals Follow-up Study. During the 14-year study, food intake of over 45,000 men was recorded using a food frequency questionnaire at baseline and every four years. The results indicated that the men consuming 250 milligrams per day of omega-3 fatty acids from plant or fish sources had a 40 to 50 percent lower risk of sudden death, regardless of their omega-6 fatty acid intake and risk factors for heart disease. The findings from this research provide the strongest evidence to date that omega-6 fatty acids do not counteract the effects of either plant or fish sources of omega-3 fatty acids.

MYTH: A high ratio of omega-6/omega-3 fatty acids indicates greater risk for heart disease.

FACT: There are multiple ways in which a high (or low) ratio of omega-6/omega-3 fatty acids can occur. For instance, a high ratio may be the result of a relatively high intake of omega-6 fatty acids, a low intake of omega-3 fatty acids, or both scenarios. Ratios are typically used when higher levels of one factor and lower levels of the other factor are predictive of increased risk (e.g., the LDL/HDL lipoprotein ratio). Yet, higher intakes of both omega-6 and omega-3 fatty acids are associated with risk reduction.

There is no evidence that lowering omega-6 fatty acid intake, which will "improve" the ratio, will result in reduced risk for heart disease. However, increasing intake of omega-3 fatty acids lowers the ratio and reduces risk, regardless of the levels of omega-6 fatty acids in the diet. When researchers compared the effects of omega-6 fatty acids with omega-3 fatty acids in subjects following a low-saturated fat diet, both types of fatty acids were found to improve blood lipid levels. Other studies have confirmed that omega-6 fatty acids are protective, not harmful, and even suggest that omega-6 and omega-3 fatty acids may have synergistic effects in reducing risk for heart disease. The AHA advises that omega-6 fatty acids are one of the "good" fats that may help to reduce risk of heart disease.

(continued on page 7)

(continued from page 1)

Good Food, Good Flavor, Good Health

(a capsaicinoid, the class of active ingredients in red or chili peppers that imparts pungency, or heat) accelerates energy expenditure and increases lipid oxidation by activating the sympathetic nervous system.

Human studies also suggest that consuming capsaicin decreases energy and fat intake and increases satiety. In one study, capsaicin was provided in tomato juice or in capsular form. Both forms of capsaicin reduced energy intake and increased satiety. These effects were more pronounced in the tomato juice group compared to capsules, demonstrating the possible sensory effect, i.e., "spiciness," of capsaicin on appetite.

Long-term studies of the effectiveness of capsaicin on weight and energy expenditure have been limited due to its pungency, especially in doses strong enough to show an effect. However, some research has demonstrated the usefulness of capsaicin analogues (capsinoids), derived from a non-pungent cultivar of sweet red pepper, in raising oxygen consumption and body temperature. Still, more research needs to be completed before recommendations related to weight loss or maintenance benefits can be made.

Turmeric (Curcumin)

Turmeric, a popular spice contained in curry powder, has been studied primarily for the potential health benefits of its active polyphenolic component, curcumin. Curcumin gives turmeric its yellow pigment, which lends itself for use not only as a dietary spice, but also as a coloring agent. According to the Food and Agriculture Organization (FAO) of the United Nations, the U.S. imports nearly 2400 metric tons (roughly 5.3 million pounds) of turmeric annually for use as a food preservative and as a flavoring and coloring agent.

Curcumin has been studied for its potential to reduce risk of cancer, osteo- and rheumatoid arthritis, and Alzheimer's disease. In animal studies, curcumin has been shown to inhibit growth of cancer-causing proteins, and in human studies it has been shown to reduce inflammation, another possible anti-cancer mechanism. Curcumin's anti-inflammatory properties may additionally be useful in alleviating symptoms of arthritis.

Curcumin has also demonstrated potent antioxidant activity, which has led to consideration of a possible protective role against Alzheimer's disease. Animal studies have suggested that curcumin protects against damage by amyloid B-proteins. Human research on curcumin and Alzheimer's disease is in its infancy, although a double-blind, placebo-controlled trial in humans with mild to moderate Alzheimer's disease is currently underway.

Cinnamon

Cinnamon is a widely used spice perhaps most notable for its use in baked treats and warm winter beverages. However, significant attention is being directed toward its potential in diabetes management. Research has suggested that cinnamon may lower blood glucose levels, increase insulin sensitivity, and/or improve lipid profiles. Because these benefits have not been demonstrated consistently, scientists are digging deeper to understand why and how the effects of cinnamon may vary among different segments of the population. Research will likely continue, given the promising results of many studies and because cinnamon is well-tolerated, safe, and inexpensive.

Ginger

Like the old stand-by saltine crackers, ginger ale is often-recommended as a remedy for nausea. Ginger, a potent root containing a matrix of constituents including gingerols, beta-carotene, capsaicin, and turmeric, is thought to act directly on the digestive tract and has been used for centuries for the treatment of nausea and vomiting. A review of studies assessing the effectiveness of ginger for nausea and vomiting found that, overall, ginger was more effective than placebo in treating nausea caused by motion sickness, morning sickness, chemotherapy, and surgery. A more recent review concluded that the effectiveness of ginger is limited to treatment of nausea caused by pregnancy. The effectiveness of ginger on the treatment of the numerous causes of nausea is still being explored.

The benefits of ginger may not stop at the gut. Recent studies also suggest that ginger may play a role in preventing inflammation, thereby possibly extending its usefulness to alleviating pain caused by arthritis. One intervention study of individuals with osteoarthritis found that reported pain levels were lower in the group taking a Chinese ginger extract versus placebo, producing pain relief similar to that achieved with ibuprofen.

Like curcumin, ginger also exhibits antioxidant properties. Its anti-inflammatory and antioxidant properties together suggest a potential role in reducing the risk of cancer. Animal studies show that the principal constituent of ginger, gingerol, inhibits carcinogenesis in the gastrointestinal tract, skin, and breast. Human studies are needed to further evaluate the efficacy of ginger in cancer prevention.

(continued on page 5)

(continued from page 4)

Good Food, Good Flavor, Good Health

Spicing up health goals

Despite the potential for herbs and spices to contribute more than just flavor to our food, dietary recommendations do not yet make specific recommendations for herbs and spices. The science in many cases is only beginning to emerge, providing validation of traditional medicinal practices, and revealing more detailed questions that must be pursued such as the effective amount of a particular herb or spice that needs to be consumed in order to see a benefit. That said, promotion of a diet that includes herbs and spices is on par with current dietary guidelines from the U.S. and many other countries worldwide. The Dietary Guidelines for Americans 2005 recommend use of herbs and spices as a strategy for reducing sodium intake. Dietary recommendations in Greece devote particular attention to herbs as beneficial in their own right: "Oregano, basil, thyme and other herbs grown in Greece are a good source of antioxidant compounds and can be a tasteful substitute for salt in the preparation of various dishes."

A sprinkling of herbs and spices on favorite foods can add a lot of flavor to life. Fullness of flavor may indeed impart specific health benefits. While the recipe for good health is still being written, the wisdom of many cultures, both ancient and modern, around the world tells us that there is value in simply enjoying food. Good food, good taste, and good health truly go hand-in-hand.

Herbs and spices: What's the difference?

An herb is the leaf of a plant or shrub, or more broadly, "the part of a plant that is used in the diet for its aromatic properties," and can be used fresh or dried. All other parts of the plant, including the buds, bark, root, seeds, berries or fruit, are referred to as spices. Examples of some common herbs are oregano, parsley, rosemary, sage, thyme, chives, and basil. Common spices include cloves (buds), cinnamon (bark), ginger (root), cumin (seeds), black peppercorn (berries), and paprika (fruit).

Herbs and Spices and Their Role in Food Safety

Many herbs and spices have long been used for their ability to reduce the growth of bacteria in foods. For example, it is known that certain herbs and spices—including clove, cinnamon, thyme, oregano, and rosemary—can function as antibacterial agents in food. Before refrigeration, food spoilage was a significant problem, especially in countries with hot climates. According to researchers, people who began adding spices to their meat in those times were reducing risk of foodborne illnesses without realizing it. Recent evidence points to another benefit for herbs and spices using the culinary technique – grilling. The use of marinades containing certain antioxidant spices such as rosemary and oregano has been shown to reduce production of potentially harmful heat-formed compounds associated with grilling meats. More research is needed to fully understand this protective property of spices and herbs.

Flavorful food-spice combinations

Meat, Poultry, Fish

Beef:
onion, pepper, thyme, marjoram

Pork:
garlic, onion, sage

Chicken:
ginger, oregano, rosemary, sage, tarragon

Fish:
curry powder, dill, paprika

Vegetables

Carrots:
cinnamon, cloves, nutmeg, marjoram, sage

Green Beans:
dill, oregano, tarragon, thyme

Potatoes
(or root vegetables such as rutabaga):
dill, garlic, paprika, parsley, sage

Winter Squash/Sweet Potatoes:
cloves, nutmeg, cinnamon, ginger

Adapted from Henneman A. Add a Little Spice (& Herbs) to Your Life! University of Nebraska-Lincoln Cooperative Extension.

Strengthen Your Nutrition and Food Safety Knowledge **(and Earn Credit) on IFIC.org!**

Tired of long lectures in cold conference rooms? Try taking one of the International Food Information Council (IFIC) Foundation's Continuing Professional Education (CPE) courses from the comfort of your living room where there's no need to even change out of your pajamas. The IFIC Foundation offers 12 free CPE courses you can take right from our Web site.

Not sure what a CPE is? The Commission on Dietetic Registration (CDR), the credentialing agency of the American Dietetic Association (ADA), requires that Registered Dietitians (RDs) and Dietetic Technicians, Registered (DTRs) participate in a mandatory professional development program to maintain their credentials. Part of this program requires that RDs and DTRs obtain and report a given number of CPE hours every five years (75 hours for RDs and 50 hours for DTRs).

The IFIC Foundation is an ADA-approved provider of continuing professional education and currently offers 12 online CPE programs with more on the way. Each module provides at least one hour of credit and is available free of charge on the IFIC Foundation Web site. All you have to do is visit **http://ific.org/adacpe**, view a slide presentation for any module that suits your interest, answer a quick quiz, and download a certificate of completion.

Not a dietitian? These CPEs can also be helpful learning tools for health and medical professionals hoping to learn more about a nutrition or food safety topic of interest. With permission, they may also be used as presentations or teaching tools for a variety of educators. And finally, they can be utilized by anyone who would like to learn more about food safety and nutrition topics.

The newest modules include "Understanding and Effectively Communicating Food and Nutrition Science: Leading Consumers to Better Health," a module designed to assist with the challenge of responsibly communicating new scientific findings to the public. Also "Helping Consumers Get the 'Big Picture:' Practical Approaches to Promoting a Healthful, Balanced Eating Pattern" is a great resource for anyone who wants a 'big picture' approach to building a healthful lifestyle. "Understanding Food Allergy: A Primer for Dietitians," was developed to aid health professionals in their understanding of food allergies and dietary management and also includes strategies for living with food allergies. Finally, "Food & Agricultural Biotechnology: Health Impacts in Developing Nations," explains nutritional impacts biotechnology can have in developing nations.

In addition to the above, we have CPE programs addressing issues such as caffeine, carbohydrates, sugar alcohols, dietary fats, consumer attitudes toward food and health, and the connection between food science and nutrition. (Full list at the end of this article)

If none of these strike your fancy, keep checking **http://ific.org/adacpe** for fresh, new modules. A CPE lesson on low-calorie sweeteners is coming soon, and if you have suggestions for other topics you'd like to see, please fill out the simple survey at the end of each online module. So if you're ready to get started just log on to your computer and try one of our free courses from the comfort of your home.

CPE modules currently available on www.ific.org:

- All About Caffeine
- New Nutrition Conversation with Consumers
- Food Biotechnology 101: A Primer on the Science & the Public Debate
- Food & Agricultural Biotechnology: Health Impacts in Developing Nations
- Sugar Alcohols
- All About Carbohydrates and Health
- A New Nutrition Conversation with Consumers about Fats in Food
- Food Science Meets Nutrition: Synergy for the Public Good
- 2007 IFIC Foundation Food and Health Survey: Consumer Attitudes toward Food, Nutrition & Health
- Understanding Food Allergy: A Primer for Dietitians
- Helping Consumers Get the "Big Picture:" Practical Approaches to Promoting a Healthful, Balanced Eating Pattern
- Communicating Food and Nutrition Science

Reevaluating Food Colors and Children's Behavior

The European Food Safety Authority (EFSA) has determined that a recent study linking artificial food colors to increased hyperactivity is not sufficient to serve as a basis for changing current Acceptable Daily Intake (ADI) levels in Europe.

The study, which was carried out by researchers at Southampton University in the UK (McCann et al, *Lancet*, 2007), tested two different drink "cocktails" that contained sodium benzoate and one of two different artificial food color mixtures. The researchers found an association between consumption of these cocktails and increased hyperactivity in two groups of children ages 3 and 8-9, respectively.

To determine the implications of this study for the general population, an EFSA panel reviewed the study in detail and concluded that, although the findings may be relevant for children who are sensitive to food additives, it is not possible to apply these findings to the general population for several reasons. First, because the food colors and additive were administered as a mixture, it is not possible to isolate one food color or additive that could be causing the results. In addition, the panel concluded the effect on children's behavior was relatively weak, and the change in behavior was not consistent between the two age groups. They also concluded, with input from behavioral experts, that "it is not known whether the small changes in attention and activity observed would interfere with schoolwork or other intellectual functioning." (EFSA press release, "EFSA evaluates Southampton study on food additives and child behavior" March 14, 2008) .

EFSA is in the process of individually reviewing all food colors approved in Europe. The U.S. Food and Drug Administration (FDA) has indicated it "has no reason to change our conclusions that the ingredients that were tested in this study that are currently permitted for food use in the U.S. are safe for the general population." ("Five Controversial Food Additives," *Newsweek Web Exclusive*, March 13, 2008).

For more information visit IFIC's Food Ingredients & Colors Brochure at: **http://www.ific.org/publications/brochures/foodingredandcolorsbroch.cfm**

(continued from page 3)

Striking a Balance: Omega-6 and Omega-3 Fatty Acids

Advice for Today

Evidence remains strong that a moderate fat diet (i.e., 20-35 percent of calories) consisting of mostly 'good' fats—polyunsaturated and monounsaturated fatty acids—supplies important essential fatty acids and offers protection against heart disease. Focusing on a ratio of omega-6/omega-3 fatty acids may distract from the more important issue of including more beneficial fats in the diet. An abundance of research supports the recommendation to obtain more omega-3 fatty acids and to replace sources of *trans* and saturated fatty acids with polyunsaturated and monounsaturated fatty acids, when possible. Including foods rich in omega-3 and omega-6 fatty acids, such as fish twice a week, seeds, nuts, flaxseed, and vegetable oils (canola, soybean, safflower, sunflower, and corn), are simple, health-promoting strategies to improve heart health.

Omega-6 and Omega-3 Fatty Acids: Recommended and Usual Intakes

	Adequate Intake (AI), Men 19-50y[1]	Usual Intake from Food, Men 19y+[2]	Adequate Intake (AI), Women 19-50y[1]	Usual Intake from Food, Women 19y+[2]
Omega-3 (alpha-linolenic acid)	1.6g/day	1.7g/day	1.1g/day	1.3g/day
Omega-6 (linoleic acid)	17g/day	16.8g/day	12g/day	12.7g/day

1 Institute of Medicine, Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids, 2002.

2 What We Eat in America, NHANES 2001-2002.

(continued on page 8)

(continued from page 7)

Striking a Balance: Omega-6 and Omega-3 Fatty Acids

Dietary Advice for Omega-3 Fatty Acids	
Healthy individuals (ages 2 and up)	Eat a variety of (preferably fatty) fish at least twice a week (about 8 ounces total). Include oils and foods rich in alpha-linolenic acid (flaxseed, canola and soybean oils; flaxseed and walnuts).
Individuals with documented coronary heart disease (CHD)	Consume about 1g of EPA+DHA per day, preferably from fatty fish. Consult a physician before supplementing
Individuals with high triglyceride levels	Consume 2 to 4g of EPA+DHA per day provided as capsules under a physician's care.

Adapted from: "Fish and Omega-3 Fatty Acids," American Heart Association; www.americanheart.org; accessed 5/15/07. Dietary Guidelines for Americans, U.S. Departments of Health and Human Services and Agriculture, 2005. www.healthierus.gov/dietaryguidelines; accessed 5/15/07.

What's New @ IFIC.org?

How to Tell When Food Has Gone Bad

The new Video section of **IFIC.org** is growing by leaps and bounds! The new "Ask an Expert" (**http://www.ific.org/videos/askanexpert.cfm**) section features "how-to" videos of Dr. Christine Bruhn from the University of California, Davis. Dr. Bruhn provides helpful and practical tips on how to tell if food has gone bad, and includes; frozen foods, produce, and even pantry foods. Food safety is for everyone and it is important that we all know how to prepare and store food properly. By following the recommended consumer tips and guidelines as well as remembering to clean, separate, cook, and chill, you will be on your way to help reduce the risk of any unwanted foodborne illness.

FoodInsight™
Current Topics in Food Safety & Nutrition

Food Insight (ISSN 1065-1497) is published by the International Food Information Council (IFIC) Foundation. The International Food Information Council (IFIC) Foundation will effectively communicate science-based information on health, nutrition, and food safety for the public good. The IFIC Foundation is supported primarily by the broad-based food, beverage and agricultural industries.

Editor: Ann Bouchoux

Associate Editor: Jennifer Schleman

Contributors: Sarah Alligood, MPH, Andy Benson, Susan Borra, RD, Gretchen Dueñas, MS, MPH, Stephanie Ferguson, Anthony Flood, Winifere Jenkins-Ford, Shelley Goldberg, MPH, RD, Kimberly Hamilton, Sharise Lindsay, Janna Matthews, Geraldine McCann, Lindsey Monroe, Wendy Reinhardt Kapsak, MS, RD, Elizabeth Rahavi, RD, Dave Schmidt, Danielle Schor, RD, Elver Arriza Silva, Jeff Strei, MA, Matt Tarka, Lauren Verduin, Cheryl Toner, MS, RD, Betsy Hornick, MS, RD

Design: Lighthouse Concepts, LLC

Permission is granted to reprint information contained herein with appropriate credit.

This newsletter is not intended to provide medical advice on personal health matters, which should be obtained directly from a qualified health professional.

© IFIC Foundation

1100 Connecticut Avenue, N.W., Suite 430
Washington, DC 20036
Email: foodinfo@ific.org
http://ific.org

Nonprofit Org.
U.S. Postage
PAID
Merrifield, VA
Permit No. 1112

Address Service Requested