Current Topics in Food Safety & Nutrition

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Consumers Remain Disconnected from Their Food: *2008 Food & Health Survey* Gauges Consumer Attitudes on Nutrition and Food Safety

The 2008 *Food & Health Survey: Consumer Attitudes toward Food, Nutrition & Health*, commissioned by the International Food Information Council Foundation, is the third annual national quantitative study designed to gain insights from consumers on these important topics. The research provides the opportunity to see how consumers view their own diets, their efforts to improve them, and their understanding of the food components in their diets and how to safely prepare food. In order to develop effective nutrition and food safety communications that would help consumers implement behavioral changes, health professionals, educators, and others can learn what issues are most important to consumers where confusion is greatest, and where educational efforts are needed.

The following are key findings from the 2008 Survey with comparisons to the results from the 2006 and 2007 editions of the *Food & Health Survey*.

Overall Health Americans' perception of their health status continues to show improvement with 39 percent indicating their health is "excellent" or "very good" compared to 33 percent in 2006. Although there was no real change from year to year, Americans' degree of satisfaction with their health status remained relatively high with 59 percent indicating that they are "extremely satisfied" or "somewhat satisfied."

Weight Americans' concern with their weight appears to be a very strong factor influencing the decision to make a dietary change. Seventy-five percent say they are concerned with their weight, compared to 74 percent in 2007 and 66 percent in 2006. In addition, 69 percent of those who made a change to their diet cite their reason is "to lose weight," and 57 percent say they are actively "trying to lose weight."

Diet and Physical Activity: Two-thirds of Americans (67 percent) reported making changes to improve the healthfulness of their diet. The specific types of dietary changes they most often reported are "changing the portion sizes of the meals or snacks I consume" (60 percent) and "changing the number of calories I consume" (57 percent). In addition, 52 percent of those trying to lose or maintain their weight reported "increased physical activity" as a specific change in 2008.

And while 57 percent of Americans who are trying to lose or maintain their weight say they are making an effort "to reduce the number of calories" they consume, there still appears to be an important disconnect between this reported behavior and Americans' general knowledge about calories. For example, only 15 percent of respondents correctly estimated the recommended number of calories per day for a person of their age, height, physical activity level, and weight; only 31 percent correctly understand that calories from any source contribute equally to

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INSIDE

What Science Says about Fructose

Media coverage of high fructose corn syrup (HFCS) and fructose increased sharply in early 2004 after publication of a hypothesis that they may play a role in the epidemic of obesity. The past several years have witnessed headlines such as *"Fructose converts to fats faster than other sugars" " Is fructose making us fat?" "Limiting fructose may boost weight loss."* More recent hypotheses have attempted to link high intakes of fructose to the development of insulin resistance, metabolic syndrome, type 2 diabetes, abnormal blood lipids, and gout. As a result of confusing HFCS with pure fructose and mistakenly thinking that HFCS and sucrose (table sugar) are very different, some communities have considered bans on the sale of foods and beverages containing high fructose corn syrup (HFCS). Does the scientific evidence warrant the singular focus on the role of fructose—regardless of dietary source—in the development of obesity and chronic disease risk?

The widespread confusion over pure fructose, glucose, HFCS, and sucrose led the Agricultural Research Service of the United States Department of Agriculture (USDA/ARS) and the International Life Sciences Institute of North America (ILSI) to convene a roundtable of nutrition and health experts to address the state of the science on dietary sweeteners containing fructose. Held March 18 and 19, 2008 in Beltsville, Maryland, the workshop, "The State of the Science on Dietary Sweeteners Containing Fructose," covered a range of topics including the chemical composition, properties, and food supply availability of dietary sweeteners that contain fructose; sources and amount of fructose in the diet; how the body metabolizes fructose; and research on the physiological effects of dietary sweeteners that contain fructose. According to Dr. David Klurfeld, National Program Leader of Human Nutrition at USDA/ARS, proceedings from the workshop will be published in a peer-reviewed journal and will help inform the scientific community of factors to consider when designing studies to evaluate the physiological effects of usual dietary intakes of fructose.

In the meantime, the workshop's discussions suggest that consumers, nutrition communicators, and those who recommend nutrition policy should know the following five things about fructose and the sugars in which it is found.

What everybody needs to know about fructose

- High fructose corn syrup is not the same as pure fructose
- HFCS is similar to sucrose (table sugar) in its physiological effects
- Experimental studies use atypical amounts and sources of fructose
- Dietary advice should focus on managing discretionary calories and energy balance, not on one specific sugar such as fructose

1. HFCS is not the same as pure fructose

Pure fructose is 100 percent fructose and zero percent glucose. HFCS, on the other hand, refers to sweeteners that contain a mixture of fructose and glucose. The most commonly used types of HFCS are HFCS-55 which contains 55 percent fructose and 45 percent glucose and HFCS-42 which contains 42 percent fructose and 58 percent glucose. In comparison, sucrose—common table sugar—contains 50 percent glucose and 50 percent fructose.

2. HFCS is essentially the same as sugar (sucrose)

Sugar, which is technically called "sucrose," is a combination of one fructose molecule and one glucose molecule. The two molecules are chemically linked, but when ingested sugar is digested to free fructose and free glucose. So in the intestine, sugar becomes 50 percent fructose and 50 percent glucose. This is almost exactly the same as HFCS. The only real difference is the HFCS does not need to be digested. It is basically pre-digested table sugar.

3. HFCS is similar to table sugar (sucrose) in its physiological effects

Sucrose (table sugar), honey, and many fruits, vegetables, and nuts naturally contain some fructose. Most contain 42 to 55 percent of total sugar content as fructose—which is similar to HFCS.
Human studies that have directly compared sucrose and HFCS-55 show

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no meaningful differences in ratings of hunger and fullness, fasting or post meal blood levels of glucose, insulin, triglycerides, or leptin and ghrelin (hormones related to satiety) as would be expected based on the simple chemistry. Independent of this conference, the American Medical Association recently conducted a review of the literature and concluded that because the composition of HFCS and sucrose are so similar, particularly with regard to absorption by the body, it appears unlikely that HFCS contributes more to obesity or other conditions than does sucrose.

4. Experimental studies use atypical sources and amounts of fructose

Since at least the early 1980s several experimental studies have evaluated the effect of fructose on biomarkers of chronic disease risk, such as fasting and post meal blood lipids, glucose, insulin, and satiety hormone concentrations; insulin sensitivity; and glycosylated proteins that provide an indicator of overall glucose control in people with diabetes. More recent studies have focused on uric acid production which has been associated with the risk for metabolic syndrome and gout.

A few studies in humans have used sucrose and/or HFCS-55 in experimental diets but most studies have used pure fructose in the absence of glucose—and most studies have fed fructose (whether from pure fructose, sucrose, or HFCS) at abnormally high levels compared to usual dietary intakes. Humans rarely consume pure fructose in the absence of glucose as there are almost no sources of pure fructose in the diet, but many human experiments have fed pure fructose at 17 to 30 percent of total calorie intake. Such experimental conditions are completely irrelevant to the normal consumption of food and thus the results of those studies are of very little value.

The primary sources of fructose in the human diet are sucrose and HFCS—both of which contain a mixture of fructose and glucose in approximately a 50:50 ratio. A diet containing 17 to 30 percent of total calorie intake from fructose would equate to 34 to 60 percent of calories coming from sucrose and/or HFCS. Such diets are highly unusual, to say the least! In fact, estimates from dietary surveys actually show an overall mean fructose intake of about eight percent of calories from all food and beverage sources depending on age and gender, so these are 2- to 7-times more fructose than normally ingested. While exaggerating exposure can be good to identify some effects, these levels could change normal metabolism and therefore are not considered predictive of what occurs under typical circumstances.

Results from studies that have tested high intakes of fructose regardless of source provide information about how the body uses pure fructose under extreme conditions and help generate hypotheses for additional research. In order to be more meaningful to consumers, future research should examine physiological effects using typical intake levels and sources of fructose in the diet, which should include some glucose. Experimental diets should contain average amounts of fructose from a mix of fruits, vegetables, and foods and beverages sweetened with both sucrose and HFCS with a fructose/glucose ratio typically found in average diets.

5. Dietary advice should focus on energy balance, not fructose

The 2005 *Dietary Guidelines* recommend that Americans choose and prepare foods with little added sugars or caloric sweeteners in amounts recommended by the USDA Food Guide (MyPyramid). The primary concern is that diets high in added sugars tend to be higher in total calories and lower in vitamins and minerals. However, according to the 2005 *Dietary Guidelines* for Americans, discretionary calories (those calories which can be added after all nutrient needs are met but staying within individual calorie needs), can be consumed, which means some foods with sugar or HFCS can be eaten as part of a healthful diet. The amount of discretionary calories that fits with the *Dietary Guidelines* depends on age, gender, and physical activity level. The discretionary calorie allowance is the amount of calories remaining after selecting the recommended amount of nutrient-dense foods in each food group. Depending on a person's caloric requirement and physical activity, additional discretionary calories can be added.

IFIC Foundation consumer research shows that consumers receive an abundance of dietary information, but not much clarity, from the media, government, and other sources including emerging science, popular diet books, and more. The resulting communication environment for sugars, including fructose and HFCS, is challenging for nutrition communicators and consumers alike. The intersection of science, dietary advice, and media coverage of complicated topics is one in which information clutter can override clarity.

Dr. Suzanne Murphy, University of Hawaii, who summarized "The State of the Science on Dietary Sweeteners

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potential weight gain; and 44 percent report that they do not balance diet and physical activity to manage their weight (calories consumed versus calories expended).

Meal Occasions: Similar to the 2007 survey, breakfast was named by 92 percent of consumers as the most important meal of the day, followed by dinner (89 percent) and lunch (83 percent); however, less than half (46 percent) of consumers say they eat breakfast seven days per week. In the 2008 survey, consumers who believe that eating breakfast is most important but do not eat it everyday cite several "barriers" including "not hungry right after I wake up" (59 percent) and "not enough time" (54 percent).

Snacks are also an important part of most Americans' days, with nearly all Americans (94 percent) consuming at least one snack per day.

Foods and Beverages with Added Health and Wellness Benefits: While "taste" and "price" continue to have the greatest impact on Americans' decisions to buy foods and beverages, the importance of "healthfulness" remained stable after increasing in 2007 (62 percent in 2008 versus 65 percent in 2007 and 58 percent in 2006). When given a list of potential changes to improve the healthfulness of their diet, Americans indicated they are increasing (37 percent) and decreasing (21 percent) their consumption of a specific type of food and/or beverage.

Sixty percent or more of Americans either somewhat or strongly believe that certain foods and beverages can provide multiple benefits (for example, heart health). As in 2007, more than 80 percent of all Americans say they are currently consuming or would be interested in consuming foods and/or beverages for such benefits.

Dietary Fats: Seventy percent of Americans are concerned with the *amount* of fat they consume and 68 percent say they are concerned with the *type* of fat they consume. Continued concern over *trans* fat appears to be an important contributor. Awareness of *trans* fat grew to 91 percent versus 87 percent in 2007 and 81 percent in 2006. Fifty-nine percent of Americans who use the Nutrition Facts Panel say they use *trans* fat information on the panel and 79 percent of Americans who are aware of it say they rated *trans* fat as either "not at all healthful" or "not very healthful," up from 64 percent in 2006.

While Americans know that type of fat is important, knowledge of the types of fats that dietary guidance recommends consuming, including mono- and polyunsaturated fats, is limited. For instance, awareness of both of these healthful fats (63 percent for monounsaturated fats and 71 percent for polyunsaturated fats) is low compared to others. However, the number of Americans who rate monounsaturated and polyunsaturated fats as either "somewhat healthful" or "extremely healthful" has increased to 28 percent and 23 percent respectively from 16 percent and 15 percent in 2006.

Sugars and Carbohydrates: Americans continue to be concerned with the amount of sugar they consume (69 percent in 2008 versus 70 percent in 2007 and 62 percent in 2006). Among Americans who use the Nutrition Facts panel, they look for information about sugar more often (68 percent compared to 63 percent in 2007 and 67 percent in 2006). Although there was no significant change in Americans' concern over the amount of carbohydrates they consume, concern with the type of carbohydrates they consume remained high at 52 percent in 2008, compared to 46 percent in 2006.

Low-Calorie Sweeteners: More Americans who are aware of low-calorie sweeteners report they are trying to consume less aspartame (43 percent), saccharin (45 percent), and sucralose (44 percent) in 2008 compared to 2007. However, there is no significant difference in approach to consumption of these low-calorie sweeteners when comparing this year's responses to those from 2006. In addition, 44 percent of Americans believe that low-calorie sweeteners can play a role in weight loss or weight management.

Caffeine Consumption: When asked to describe their level of caffeine consumption, 64 percent of Americans say they "consume caffeine in moderation." Twenty-two percent describe themselves as consuming "more caffeine than the average person," and 14 percent say they have "eliminated caffeine" from their diets.

Food Additives/Colors: Consumers were asked to answer a new question this year about their beliefs pertaining to the accuracy of several statements about food additives/colors. The result was that 85 percent of Americans believe food additives can provide at least one of the following benefits: they can extend the freshness of certain foods/act as a preservative (68 percent); add color to food products (65 percent); help keep or improve the flavor of food products (61 percent); and reduce the presence of harmful bacteria in food products (36 percent).

Safe Food Preparation: New to this year's survey were questions regarding safe food preparation at home. Eighty-two percent of consumers say they are confident in their ability to safely prepare foods at home, but that confidence does not match reported practices.

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Almost all Americans (96 percent) say they are regularly taking at least one food safety precaution, such as washing hands with soap and water, when cooking, preparing, and consuming food products. However, fewer report following key basic food safety practices, such as using a different cutting board for each type of food (48 percent) and using a food thermometer to measure the internal temperature of meat and poultry items (29 percent). A majority of Americans (79 percent) are confident in their ability to understand and follow microwave oven meal cooking instructions, but only 15 percent check their microwave wattage and only 7 percent use a food thermometer for microwaved foods.

Consumer Use of Information Sources: In addition to the information gathered on the Nutrition Facts panel and the food label, consumers were asked about their awareness and use of the United States Department of Agriculture's (USDA) *MyPyramid* food guidance system. Eighty-seven percent of Americans say they are aware of *MyPyramid* and 26 percent of individuals report having used *MyPyramid* in some way.

The full survey report conducted by Cogent Research, Cambridge, MA, is available on the IFIC Web site at **http://www.ific.org/research/foodandhealthsurvey.cfm**. To view a Web cast of the findings, visit **http://www.ific.org/research/2008fandhsurveywebcast.cfm**.

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What Science Says about Fructose

Containing Fructose" workshop's discussions, suggested that appropriate consumer messages should support the *Dietary Guidelines*. It is not helpful to offer potentially confusing recommendations about fructose when they are inherently misleading and current dietary guidance already advises that a healthful eating plan is one that is low in saturated fats, *trans* fats, cholesterol, salt (sodium), and added sugars.

The role of fructose in disease remains unclear; much more research is needed to fully understand: multiple dietary and lifestyle factors that influence obesity, insulin resistance, cardiovascular disease, and diabetes; and dietary advice based on the *Dietary Guidelines* for Americans.

Selected dietary sources of fructose and percent content of total sugars

Source	Percent Fructose
Crystalline Fructose (pure fructose)	100%
Apples, pears	≥ 66
Raspberries, watermelon	56-65
HFCS-55	55
Bananas, grapes, oranges, peaches	42-55
Table sugar	50
Honey	48
HFCS-42	42

Monkeying Around with Food:
New "How-To" Videos Bring Food and Health Information to the Public

Following the successful launch of the International Food Information Council (IFIC) Foundation and Monkeysee.com's first cooperative project—the expert demonstration video "How to Tell if Your Food Has Gone Bad" – IFIC Foundation and Monkeysee.com have partnered again on five additional expert video demos and interviews. Two of these new additions provide information on timely food safety topics for consumers: safe food preparation using a microwave oven and food allergy basics. The other three videos address common consumer questions about nutrition: how to help your diet survive the office; how to eat more than you think and lose weight; and how to eat right to feel great. All videos are available on IFIC Foundation's *Ask An Expert* Web page **(http://www.ific.org/videos/Index.cfm)**.

The video, "How to Safely Prepare Food Using a Microwave Oven" features food safety expert Dr. Sue Snider, from the Department of Animal and Food Sciences at the University of Delaware. In the video, Dr. Snider discusses the basics of preparing food safely in a microwave oven and demonstrates key food safety practices, including proper use of a food thermometer and practical food safety tips for children, teens, and college students. This demo promises to be a fitting educational tool for consumers, as the recently released IFIC Foundation 2008 Food and Health Survey **(http://www.ific.org/research/foodandhealthsurvey.cfm)** found that while a majority of Americans (79 percent) are confident in their ability to understand and follow microwave meal cooking instructions, only 15 percent check the microwave wattage, and even fewer Americans (seven percent) use a food thermometer when preparing microwave foods. These two consumer food safety "disconnects" provide key insights for the development of consumer-friendly food safety educational tools, such as this demo video.

The "Ask an Expert" video collection also features an interview with food safety expert Dr. Robert Gravani, from the Department of Food Science at Cornell University. In this interview, Dr. Gravani provides answers to common food allergy questions. This video is also a timely production with a continued emphasis on the importance of food allergy education and management. According to the Centers for Disease Control and Prevention, approximately 12 million Americans are currently living with food allergies; this expert interview can reach large online audiences and provide education on food allergy prevention in a convenient, user-friendly format. Topics such as the Big Eight food allergens, common food allergy symptoms, food allergy management, and the difference between food allergy and food intolerance are discussed in this expert interview.

The IFIC Foundation's "Ask an Expert" nutrition-related video collection features IFIC Foundation registered dietitian and weight management specialist Wendy Reinhardt Kapsak, MS, RD. In this video series, Reinhardt Kapsak offers step-by-step advice on "How to Help Your Diet Survive the Office" by addressing questions like "how do I get started on a smart diet plan?" and "what do you do if your work schedule is unpredictable?" Other topics include time management, establishing goals with a buddy, and making the diet a top priority. This accomplished dietitian brings the issue of maintaining a healthful diet straight to the consumer by acknowledging barriers such as the availability of food in an office environment. She also helps consumers keep a positive attitude by characterizing each food temptation as a possibility to make a healthful decision and explaining how to include favorite foods by practicing moderation.

Another nutrition video series features an interview with IFIC Foundation staff member Elizabeth Rahavi, RD as she answers the age-old question of "How to Eat More Than You Think and Lose Weight." The *Food and Health Survey* shows that 75 percent of consumers are concerned about their weight status and more than half, or 57 percent, say they are trying to lose weight. This informative "how-to" segment speaks directly to consumers as Rahavi guides them through discussions about weight loss, small changes that can have big results, balancing meals throughout the day, and the benefits of breakfast, among other topics. Rahavi provides an abundance of real-life examples and tips to help the consumer translate knowledge into action and encourages small changes to get started on the road to success.

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IFIC and the School Nutrition Association Team Up: Presenting the Facts about HFCS

The International Food Information Council Foundation and the School Nutrition Association Foundation worked in partnership to produce a Webinar, "High Fructose Corn Syrup (HFCS) and School Wellness: Science-Based Facts for Healthful School Nutrition Operations." The Webinar aired live on May 7, 2008 and can be accessed on the IFIC Foundation Web site **(http://ific.org)**.

This free Web-based seminar (Webinar) was developed to clarify the issues surrounding HFCS by presenting nutrition, food science, and consumer perspectives.

Speakers provided data-driven facts to correct misunderstandings about HFCS and included food science expert John White, PhD and nutrition scientist Theresa Nicklas, PhD. The scientific discussion is followed by the detailed, real-life experience of managing this topic in the school foodservice setting.

The information provided by this Webinar will be of interest to anyone wishing to learn more about HFCS. To view the Webinar go to: IFIC Foundation Web Casts at **http://www.ific.org/videos/webcasts.cfm**.

Do Low-Calorie Sweeteners Cause Weight Gain?

You may have heard stories in the news lately and wondered: What is the truth about low-calorie sweeteners? Do they help or hurt weight management efforts? While controversy over this issue in the media has created some confusion, the overwhelming majority of the research shows that low-calorie sweeteners can and do aid in weight loss/maintenance.

Low-calorie sweeteners can play a role in reducing body weight and body mass index (BMI) because they contain very few or no calories, helping to reduce total calorie intake. While a few studies have claimed low-calorie sweeteners cause weight gain, they have not changed general scientific consensus that low-calorie sweeteners aid in weight management.

A recent study from Purdue University found that consumption of saccharin led to increased appetite and weight gain in rats. (Swithers and Davidson, 2008) However, issues with the study's size and design prevented the results from being applied to humans. According to Keith-Thomas Ayoob, EdD, RD, FADA of Albert Einstein College of Medicine, "This study has its share of weaknesses, such as studying a very small number of rats — as few as eight in some of the groups…What's more, these results contrast with other studies showing that rats do compensate for calories pretty well when there is no perceptible taste difference." (*ABCNews.com*, February 2008) In addition, other rat studies have shown no increase in body weight from low-calorie sweetener consumption.

Studies in humans have also demonstrated low-calorie sweeteners' effectiveness for weight management. A recent review of low-calorie sweetener research concluded that when sugar-sweetened products were substituted with aspartame-sweetened products, a 0.2 kg (or 0.4 lb) per week weight loss occurred in the participants (de la Hunty, et al, 2006). Other expert reviews have reached similar conclusions.

A look at the science clearly shows that low-calorie sweeteners can be effective for weight management. While eating healthfully and exercising are the best things you can do to manage weight, low-calorie sweeteners can also help play a role.

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Monkeying Around with Food

The video, "How to Eat Right and Feel Great," features IFIC staff member Sarah Alligood, MPH, RD answering a variety of consumer questions about food and an overall healthful lifestyle. The 2008 *IFIC Foundation Food & Health Survey* finds that 67 percent of consumers are trying to improve the healthfulness of their diet and 69 percent of those say they are doing so to improve their overall wellbeing. In this video series, Alligood gives a dietitian's insights on how to do just that by addressing topics like body weight, physical activity, a healthful eating plan, meal quantities, dietary fats, carbohydrates, and foods with added health benefits. Each segment includes positive, practical information for the consumer with simple tips on how to incorporate healthful behaviors into everyday life.

Commentary

Food and Agriculture's Teachable Moment

The following article, authored by David B Schmidt, president and CEO of the International Food Information Council and CEO of the IFIC Foundation, is adapted from the July 2008 issue of FoodiE-News a publication of the American Farm Bureau Federation.

Today's scenario of spiraling food and fuel costs, challenges to the supply of commodities, international trade uncertainties and a struggling economy have all formed a perfect storm for consumers. Many of us have spoken about this potential outcome and how important agriculture and the use of the best technologies would be to help future generations. This situation also presents an opportunity to communicate to an engaged public, who may have previously tuned us out.

During the recent salmonella outbreak in produce, we posted advice for consumers on ific.org. We also provided links to the US Food and Drug Administration so readers could find the latest information on the outbreak.

It's no wonder consumers are often confused, but a large segment of the population tends to be oblivious to much of the information thrust upon them. That may be changing due to the reality of the food and fuel issues that are bringing the role of agriculture to the front and center of national policy debates. We need to recognize that this may be one of the greatest teachable moments for food and agriculture that we've had in decades. Our messages have never been more important, because I'm convinced more people than ever are paying attention.

Media have already focused on consumers trying to save food longer to spread their food dollar. That has given rise to concerns about how consumers will store leftovers—a clear opportunity for food safety education to an attentive audience. Greater appreciation for the food we have is an opportunity to improve the quality of our diets—and therefore our health. Technologies like agricultural biotechnology, which have been dismissed by many as unnecessary, are now getting a well-deserved second look by European authorities, the World Health Organization and others as critical tools in meeting the increasing global demands on agriculture.

So it's time to sharpen our messages and even dust off some effective older ones, because the public is now hungry for reliable information about the safety and benefits of their food supply.

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