

FOOD Insight™

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The Road to Reducing Trans Fat in the Food Supply:

A Year of Progress...Miles Left to Travel



in a wide range of foods without incorporation of saturated fats. At the time, initial research suggested that replacing animal fats with partially hydrogenated fats was suitable but the health implications of partial hydrogenation remained to be fully determined.

Decades later, epidemiologic research has emerged to associate *trans* fat with an increased risk of coronary heart disease and stroke. Coupled with heightened attention to nutrition, considerable pressure has mounted to reduce or remove *trans* fat from the food supply. On January 1, 2006, federal *trans* fat labeling regulations went into effect, impacting food products on grocery store shelves.

The political call for action, as much as the science, attracted significant public attention. County and city initiatives were proposed to restrict the use, or require declaration of the use of partially hydrogenated oils in restaurants. At the same time, there were discussions among health advocates, the food industry, and policymakers

recognizing that *trans* fat was in the food supply in part due to earlier health campaigns to reduce saturated fat. Therefore, a desire remained to find long-term, healthful, and sustainable alternatives to *trans* fats in food.

The 2005 Dietary Guidelines for Americans recommend consuming most of our fats from mono- and polyunsaturated sources rather than saturated and *trans*. The Guidelines state that we currently consume just over 11 percent of calories from saturated fat compared to about two and one-half percent of calories from *trans* fat. Consequently, it is important that alternative options are known, affordable, and available in proper supply so that saturated fats are not used solely as a replacement for *trans* fat.

In October 2006, the American Heart Association (AHA) conducted a *Trans* Fat Industry Conference to discuss the advances in and challenges to reducing *trans* fat without increasing saturated fat. Representatives from multiple industries and disciplines (agriculture, oil processing, food manufacturing, food service, government, food technology, health, and nutrition) participated. Building on the foundation provided by the

The *Trans* Fat Story

It is hot news, but *not* “new” news. *Trans* fat was more widely introduced to the American diet during the 1960s when food producers were encouraged to cut saturated fat by public health advocates. Vegetable oils from certain plant sources, such as soy and corn were plentiful, but did not have the quality characteristics of saturated fats. Partial hydrogenation enabled the production of *trans* fats, which had more of the physical and melting characteristics of saturated fats like butter, and so, could be used

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Energy Drinks: The Fads and the Facts

and June 2007, U.S. consumers spent \$744 million on them, a 34 percent increase over the previous year (*Consumer Reports*, 2007). First introduced in 1997, their popularity is visible in the wide array of energy drink offerings on store shelves and the attention they garner with the news media. Energy drinks typically contain higher levels of caffeine than soda, and also may contain glucose, guarana (a natural source of caffeine) and taurine, all of which have also been associated with a perception of increased energy.

Caffeine has been consumed for thousands of years in foods and beverages such as coffee, tea, and chocolate. The U.S. Food and Drug Administration (FDA) has classified caffeine as Generally Recognized As Safe (GRAS), and the American Medical Association (AMA) holds the position that “Moderate tea or coffee drinkers probably need have no concern for their health relative to their caffeine consumption provided other lifestyle habits (diet, alcohol consumption) are moderate as well.” Most experts consider moderate caffeine consumption to be about 300 mg, or about three cups of coffee per day for all populations, including sensitive subpopulations such as pregnant women (IFIC Foundation’s IFIC Review—Caffeine and Health: Clarifying the Controversies, 2007).

A study in the *Journal of Analytical Toxicology* (2006) found that when ten different brands of energy drinks were tested, caffeine levels ranged from 0-141 mg/serving. In comparison, an average eight-ounce cup of brewed

coffee contains 65 to 120 mg of caffeine, tea has 20 to 90 mg, and caffeinated soft drinks have 20 to 40 mg per serving. A person wishing to consume a moderate amount of caffeine would need to take into account the amount of caffeine consumed from all sources to stay within a range of 300 mg per day.

Caffeine has been shown to have benefits related to physical and mental performance. Some studies using energy drinks have shown that energy drinks can improve or maintain mood and performance during tedious and mentally demanding tasks. One study (*Amino Acids*, 2000) in particular measured how a drink containing taurine and caffeine affected human mental performance and mood. The study tested motor reaction times in response to hearing a specific tone. The group that did not consume the energy drink had significantly longer reaction times at the end of the study, whereas the group that had consumed the energy drink mixture maintained their reaction times. Similarly, the participants were asked to complete the Basler Psychological Balance questionnaire, a common measure of well-being, both before and after the study. The non-energy drink group reported reduced feelings of well-being, vitality and social exuberance at the end of the study, whereas the energy drink group maintained their feelings of well-being. The study was split between habitual caffeine drinkers and non-caffeine drinkers to ensure that symptoms sometimes felt from the absence of caffeine were not causing the decline.

It’s hard not to notice the flood of stories about energy drinks in the media these days. Energy drinks have become popular with both teens and adults alike because of their claim to increase stamina and mental and athletic performance. However, despite their popularity and the lower-calorie alternatives that are available, a number of questions have been raised pertaining to energy drinks’ appeal to the younger crowd and their caloric and caffeine content. In addition, there have been anecdotal reports of increases in emergency room visits due to excessive caffeine intake and, among other young adults, combining energy drinks with alcohol. Although the energy drink beverage category is seemingly gaining momentum, there is little research to understand consumption patterns and potential health effects. The conflicting stories have people wondering: What’s the real deal with energy drinks?

Energy drinks are the fastest growing beverage category in the United States. Between June 2006

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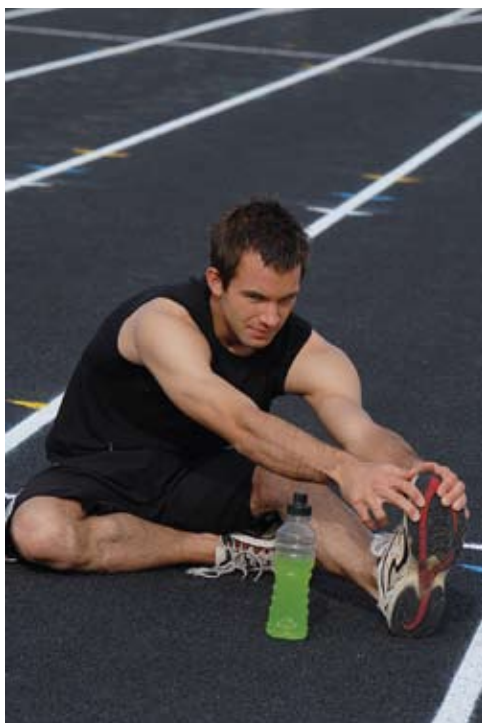
Energy Drinks: The Fads and the Facts

Improved performance in situations that cause fatigue is generally the aspect of caffeine-containing drinks that consumers (such as college students looking to stay awake to study for a big test) seek. However, consuming energy drinks, coffee, or other caffeinated beverages as a substitution for sleep will eventually lead to sleep deprivation, which can have undesirable effects. Consuming very high levels of caffeine has also been associated with increased heart rate, nausea, restlessness, anxiety, and tremors. Caffeine consumption levels that lead to these symptoms vary for each individual; however, moderate caffeine intake has not been shown to cause these effects in the normal, healthy population.

Individual sensitivity to caffeine varies, so consumers who are concerned should calculate their intake. Caffeine must be listed as an ingredient on the product label, and although labeling the *amount* of caffeine is not mandatory, many manufacturers of caffeine-containing beverages, including energy drinks, voluntarily include this information. If the caffeine content is not included on the label, it may be obtained by visiting the company Web site or calling the company's customer service line. Not all energy drinks contain the same amount of caffeine, so the amount in one cannot be estimated based on another. Certain subpopulations such as pregnant

women and children should monitor their caffeine intake and consult their physician regarding their own personal consumption levels.

In addition to questions related to caffeine, the popularity of energy drinks with children and teens has parents concerned about possible contributions to childhood obesity, due to potential consumption of excess calories. Some energy drinks may contain 200 or more calories per serving, which, as with other high-calorie foods and drinks, may cause weight gain, especially when consumed in amounts that exceed the daily need. While there is considerable debate on the contribution of high-calorie drinks to the burgeoning problem of overweight with children and adults, it is clear that management



of overall daily caloric intake is one way to avoid excess weight gain. Consumption of energy drinks should be moderated, as with any other food or beverage, to ensure appropriate overall calorie and micronutrient intake.

There have been several studies on caffeine's effects on metabolism and weight change. In a study in the *American Journal of Clinical Nutrition* (1980), caffeine and caffeinated coffee significantly increased metabolic rate during the three hours after ingestion. Lipid oxidation was also shown to increase in subjects performing exercise after caffeine ingestion. The study therefore concluded that the consumption of caffeine or coffee, in reasonable amounts, would be a supplementary advantage to those following a weight reduction regime. However, using caffeine as a weight loss tool is generally not recommended.

At this relatively early stage of energy drinks in the marketplace, more research is needed to determine their long-term effects on health and obesity. Based on current research, energy drinks have been shown to improve performance and mood due to their caffeine content. As with all sources of caffeine and calories, moderate intake should be emphasized.

Reducing Trans Fats

five key learnings of the Conference, what progress has been made over the past year?

Conference Findings... Where Are We Now?

Much has happened to change the landscape for *trans* fats. Re-evaluating the environment a year later, following are some of the AHA Conference outcomes:

Public Health Potential through Cooperation

There were two overarching conclusions from the conference that had implications for food and health, well beyond *trans* fat. The first was a broad recognition that *changing the food supply can improve public health*. The second was recognition that *cooperation among professionals with diverse expertise (i.e., nutrition scientists, food scientists, and policymakers) would be critical to making such meaningful changes in the food supply*.

Food Service on the Front Line

Conference participants recognized that *food service companies and restaurants were already increasing efforts to reduce trans fat in the foods they serve*. A ban on *trans* fat in New York City restaurants had been proposed, and there were concerns about the difficulties that lay ahead, given the realities of food production. Today, the NYC ban has taken effect and other cities and counties across the U.S. have either enacted similar restrictions on *trans* fat, or strongly encourage restaurants to adopt a voluntary reduction. Tight timelines imposed by these policy decisions have increased market demand for alternatives to *trans* fat beyond the currently available supply.

One Size Does Not Fit All

The difficulty in meeting demand is rooted in the other learnings put forth by the 2006 AHA *Trans Fat Industry Conference*. *Determining acceptable replacements that meet*

health and functionality goals, as well as consumer preferences, is a complex process.

Improving the healthfulness of fats in foods requires taking a close look at how oils and solid fats are used in food production. For both liquid and solid fats, a number of alternatives must be developed to fit all necessary applications. Specific to oils, many options are being developed for such applications as frying and making packaged crackers and cookies. Progress has also been made in the spreads category as many products now have 0.5g or less of *trans* fat per serving. While functionality requirements in applications that use liquid oils are being met, challenges related to supply and cost still remain.

For solid fats, food scientists continue to strive for solutions to functional needs, particularly in baked goods. Croissants, for example, are made with either saturated (butter) or *trans* (partially hydrogenated vegetable shortening)



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Reducing Trans Fats

“Determining acceptable replacements that meet health and functionality goals, as well as consumer preferences, is a complex process.”

fats to produce the flaky texture. In addition, food manufacturers and restaurants have particular shelf life standards for various products and menu items to ensure quality and safety. Therefore, choosing *trans*-free oils and shortenings that meet functional requirements (e.g., taste, texture, shelf life) without increasing saturated fat poses a significant challenge.

Beyond health and functionality considerations, bringing alternative oils to market requires a high level of coordination, time, and money. Market demand for alternative oils is as varied as the foods we eat. This particular demand requires segmentation of supply, which is possible with adequate time and investment.

Communication is Key

Finally, the conference concluded that *extensive communication efforts are needed throughout the food supply chain to increase knowledge transfer and reduce risks related to changes*. This requires that individuals at each link in the food chain talk to one another. For example, the food manufacturer provides guidance to the seed producer regarding the nutritional and functional characteristics needed in the oils it uses. The farmer coordinates efforts with the oil processor to keep alternative oils separate from other oils. Likewise, nutrition scientists convey the nutritional needs of the public to food producers, while food scientists help food producers to

meet both nutritional requirements and consumer preferences.

Educating and sharing information with the public is an important component of this learning, as well. According to the *2007 International Food Information Council (IFIC) Foundation's Food and Health Survey*, consumers are increasingly aware of the health implications of *trans* fat, and report trying to consume less.

Public Health Impact?

As the food supply significantly influences public health, researchers continue to examine the potential health impact and food technology options associated with modifying dietary fat content. Reformulating the wide range of foods that include fats is a process that requires holistic consideration, taking into account the entire nutrient profile, rather than a single aspect, such as *trans* fat. The solution requires attention to quality, safety, consumer preferences, and health. And clearly, reformulation is just part of a story that includes public education and outreach.

Health professionals are primed to advance the role of nutrition education. Eating a well-balanced diet, including a variety of nutrient-dense foods, is a vital message to bring to consumers. Effectively coordinating research, food production, policy, and education is essential to improving public health.

NewsBites

Good Nutrition during Pregnancy may Reduce Chronic Disease in Adulthood

Good nutrition is essential for a healthy pregnancy outcome for both mother and baby. During pregnancy, a woman needs an adequate intake of protein, calcium, iron and folic acid and about 300 extra calories per day in the second and third trimesters. A balanced diet rich in a variety of whole grains, fruits, vegetables, low-fat dairy products, low-fat meat and beans, and other foods can help meet nutrient needs. New research suggests that good nutrition can also reduce the risk for chronic diseases in adulthood such as obesity, type 2 diabetes, and heart disease.

Dr. David Barker, a physician and professor of clinical epidemiology at the University of Southampton (UK) and the keynote speaker on the “Fetal Origins of Chronic Adult Disease” at the 2007 Tufts University Friedman School Symposium, suggests that the risk for chronic disease begins during pregnancy or as early as pre-conception as a result of undernutrition. Pregnancy is a crucial period in development for the baby. Poor nutrition during fetal life increases the risk for lower birth weight, leads to impaired weight gain during infancy and childhood, and permanently changes tissues and vital organs such as the heart and kidneys. Studies show that low birth weight is associated with an increased risk of coronary heart disease, hypertension, stroke and type 2 diabetes.

A woman who follows a healthful diet, exercises, and monitors her weight gain during pregnancy may be able to improve the health of her baby as well as in later life. More information on healthful eating during pregnancy can be found at <http://ific.org/publications/brochures/pregnancybroch.cfm>.

Communicating Science in the Evolving World of Social Media

Ready or not, the world of “consumer journalism” has arrived thanks to Web 2.0. Despite the name, Web 2.0 is not a software update, but rather the “second generation of the World Wide Web” complete with blogs, vlogs, RSS feeds, wikis, podcasts, and a whole host of user-generated content. The key is open-source software, which allows individual users to become journalists, opinion makers, and community organizers. The risks can’t go unnoticed—content can be readily changed by anyone, discussion is free form, and vocal opponents may appear at any time in this ever-changing media world. And yet, social media offers tremendous opportunity for those willing to step out of their “first generation” comfort zones.

In the Web 2.0 world, social media allow individuals to become “consumer journalists” and to spread their opinions to large audiences with ease. In turn, a collective intelligence emerges as individual, like-minded voices aggregate and grow exponentially in cyberspace. Take communications on food biotechnology, for example. The reality is that the current online Web 2.0 world is often about online community creation first and content second. While this hierarchy of community over content may not proliferate sound science information by itself, it is likely that a community will form through emotional connections and similar interests. It then becomes theoretically possible to communicate credible science information that is broadly accessible and relevant to that particular community.

Smart users of new media take steps to ensure their voices are heard. They routinely update their site with new content, link heavily, and encourage comments and postings to stimulate active

discussion. In this world of “consumer journalism,” the dialogue component is as critical to the credibility piece of the equation as peer-reviewed publication is to the research scientist.

The other key step to reach the new media crowd in particular is to use humor. College students and recent graduates are 40 percent more likely to respond to a humorous message than a fact-based one. To reach this audience, the International Food Information Council Foundation recently made its foray into new media by creating a humorous video short (~5 minutes) on YouTube (http://www.youtube.com/profile_videos?user=IFICWhatsForLunch) and hosted on IFIC’s Web site (www.ific.org/videos). “What’s for Lunch?” is designed to share an informative, yet funny take on food biotechnology and features “on the street” consumer interviews interspersed with expert interviews from an academic, a dietitian, a farmer, and a school principal. The video is designed to prompt discussion and debate on the issues of food production using new technology.

The idea that transparency becomes the true measure of credibility when communicating science using social media is supported by the popularity of Wikipedia, a user-generated, user-maintained online encyclopedia. Despite controversy over the reliability of the content, Wikipedia is visited by 36 percent of American adult internet users. Wikipedia and other wikis are full of hyperlinks, and one of the main determinants in Google’s search results algorithm is the number of links connected to a given Web page. Therefore, the numerous internal and external links allow Wikipedia material to soar up the Google rankings on keyword queries. For better or worse,

Wikipedia is representative of the new online community where transparency and user interactivity are viewed as the true measure of credibility.

Given this dynamic landscape, the following guidelines apply:

- 1) Be open and adaptive to whatever arises each hour in your corner of the online world. This dynamism is what ultimately confers credibility. By being open to discussion and open to divergent points of view, the individual user senses there is nothing to hide, which in today’s world of information overload, creates instant credibility.
- 2) Recognize the limitless potential to communicate science using new media. Once online credibility exists through transparency and a willingness to engage, then it becomes possible to communicate on a deeper level that pushes the science forward, even as it bumps up against the often more emotive voices of consumer journalism.
- 3) Accept that community formation supersedes content creation. The drivers of behavior change and consumer acceptance of new technologies are increasingly becoming the online consumer communities themselves. Ultimately, purchase intent will be informed by other like-minded consumers.

The overlap of science and “consumer journalism” is an unfolding process, with no absolute certainties. This, however, does not preclude the importance of considering the possibilities. While the Web 2.0 world may feel like the Wild West to the uninitiated, it is studded with rewards for those who choose to gallop forward smartly.

New and Improved IFIC Review on Caffeine and Health Puts Myths to Rest

The IFIC Foundation has newly updated its IFIC Review *Caffeine & Health: Clarifying the Controversies*. The Review is a comprehensive summary of the research on caffeine's effects on a wide variety of health conditions, as well as health benefits and emerging areas of science, such as immunity and genetics.

The studies referenced in the Review also demonstrate that, while sensitive subpopulations (such as those with history of heart disease and those who know they react to even small amounts of caffeine) should monitor their caffeine intake, moderate consumption of up to

300 mg of caffeine per day, or the equivalent of three 8-ounce cups of coffee, does not adversely affect the majority of normal, healthy adults. Even pregnant women and children can safely consume moderate amounts, according to the research. However, each individual is different, so members of sensitive subpopulations should check with their doctor for advice about how much caffeine to consume.

Current research also refutes some common misperceptions about caffeine pertaining to dehydration, osteoporosis, miscarriage, heart disease, and heartburn. The evidence

shows caffeine does not cause any of these conditions. In addition, research has shown a protective effect of caffeine against certain types of cancer (colon, colorectal, liver), atrial fibrillation, type 2 diabetes, Parkinson's Disease, cirrhosis of the liver, and chronic liver disease.

To download a copy of the Review, visit the IFIC Foundation Web site: <http://www.ific.org/publications/reviews/caffeineir.cfm>.

To purchase copies, visit the IFIC Foundation online Publications Store at <http://www.ificpubs.org/servlet/StoreFront>

WHO Official Outlines Global Priorities for Food and Health

Dr. Peter Karim Ben Embarek, Department of Food Safety, Zoonoses and Foodborne Diseases, World Health Organization, presented the Keynote address at the International Symposium on Food Safety and Nutrition Communications, December 6, 2007 in Bangkok, Thailand.

Dr. Ben Embarek outlined the World Health Organization's priorities regarding food safety and nutrition, highlighting key initiatives aimed at reducing incidences of foodborne and waterborne illness, at detecting and containing outbreaks of animal disease, and responding to and helping prevent intentional contamination of the food supply.

He also outlined measures to help ensure the safe preparation and handling of adult and infant food, and initiatives aimed at reducing the global incidence of malnutrition and stunting in children.

Partnerships and shared responsibility, both at international

and national levels, are increasingly important. WHO strongly encourages greater linkages between stakeholders at different parts of the food chain. "The application of risk-based approaches, with a focus on results-oriented measures, requires a strong linkage between food control systems and foodborne disease surveillance." Stakeholders can help by providing information to assess the effectiveness of interventions.

Dr. Ben Embarek stressed the need to promote healthful diets and improve the nutritional status of the population through the life course, particularly among the vulnerable, and contribute to the achievement of the Millennium Development Goals. The United Nations' Millennium Development Goals address eight key objectives that range from halving extreme poverty and hunger to halting the spread of HIV/AIDS, malaria and other diseases, all by the target date of 2015. Reducing child mortality, improving maternal health, promoting gender equality, ensuring

environmental sustainability, achieving universal primary education and advancing a global partnership for development are the other key program elements.

Referring to obesity as "a growing epidemic affecting all countries", Dr. Ben Embarek summarized the central challenge of coming to agreement on recommendations tailored to different groups, and reaching and influencing those groups through effective communications, and using different instruments to affect consumption.

With a call for all stakeholders to work cooperatively in ensuring a healthful and a safe food supply, Dr. Ben Embarek concluded by urging participants to consider that our shared challenge is to understand consumers' perception of risks, to be a trusted source of information, and to be able to communicate about risks, including uncertainty, clearly and rapidly.

What's New @ IFIC.org?

In an effort to clarify some of the issues surrounding food and food products from cloned animals or their offspring, the IFIC Foundation has developed *Questions & Answers About Foods from Cloned Animals*. The Q&A can be accessed at <http://www.ific.org/publications/qa/cloningqa.cfm>

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