

IDEAS

For Food Processors



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Cooperative Extension Service, New Mexico State University

About The FDA Bioterrorism Regulations

By David Arvelo, Small Business Representative

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The events of September 11, 2001, reinforced the need to enhance the security of the United States. Congress responded by passing the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (the Bioterrorism Act), which President Bush signed into law June 12, 2002.

The FDA is responsible for carrying out certain provisions of the Bioterrorism Act, specifically protection of the food and drug supply. To carry out these provisions, FDA published, on October 10, 2003, an interim final regulation, Registration Of Food Facilities. It requires domestic and foreign facilities that manufacture/process, pack, or hold for human or animal consumption in the United States to register with the FDA. The Bioterrorism Act also requires that FDA receive prior notice of food imported into the United States.

Registration Of Food Facilities

Under the interim final regulation, all affected facilities must register with the FDA. In the event of a potential or actual bioterrorism incident or an outbreak of food-borne illness, this facility registration information will help FDA to

determine the location and source of the event and permit the agency to quickly notify facilities that may be affected.

This new regulation pertains only to facilities that manufacture/process, pack, or hold food, as defined in the regulation, for consumption in the U.S., or an individual authorized by one of them. Any of these must register their facility with FDA.

Foreign facilities must designate a U.S. agent (for example, a facility's importer or broker), who must live or maintain a place of business in the U.S. and be physically present in the U.S. for purposes of registration. Domestic facilities must register whether or not food from the facility enters interstate commerce.

Registration is required only once for each food facility. However, required registration information must be updated if it changes and cancelled when a facility goes out of business. There is no fee for registration, updates, or cancellation of any registration.

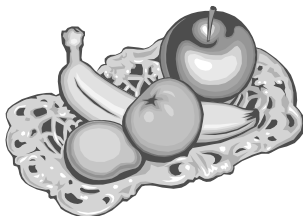
Facilities may register online via the

(Continued on page 4)

Sanitizing Fresh Fruit and Produce

Household bleach and sodium and calcium hypochlorite treatment for swimming pools are commonly used for agricultural applications such as water treatment, equipment sanitation, and process water used to wash and transport fruits and vegetables. However, legally only four forms of chlorine should be used for these applications. These forms are chlorine gas (Cl_2), calcium hypochlorite (CaCl_2O_2), sodium hypochlorite (NaOCl) and chlorine dioxide (ClO_2).

Chlorine gas can be injected or bubbled into wash tank water that becomes heavily soiled with organic matter. Calcium hypochlorite is common as a granulated powder or compressed tablet that must be pre-mixed with cool water to dissolve before use to prevent bleaching or burning of produce. Sodium hypochlorite is often used, as a liquid at 5.25% or 12.75% level, which is not the same as household bleach. This form is considered most expensive because of shipping and handling costs associated with a caustic liquid. Chlorine dioxide is highly effective and can be generated on-site by combining chlorine gas with sodium chlo-



rite or combining sodium hypochlorite, hydrochloric acid and sodium chlorite. Chlorine dioxide is highly explosive and must be monitored closely and protected against exposure to ammonia compounds.

Process water (re-circulated used water) used in drop tanks or spray washers should have a concentration of 50 to 200 ppm, with a contact time of 1-2 minutes to be effective against surface bacterial and fungal contamination. Potable water should be used in the final handling of produce such as washing, grading, and cooling.

Regardless of chlorine source used, proper documentation of concentration, pH and location of use must be monitored consistently and often to ensure that the proper amount of sanitizer is utilized.

(Adapted from "Chlorination in the production and post-harvest handling of fresh fruit and vegetables" by Trevor Suslow, UC-Davis. <http://postharvest.ucdavis.edu>)

A Message from the Editor...

This edition offers an update on Compliance on the Bioterrorism Act requirements for food processors. Dr. M. Ann Bock, Professor, Human Nutrition at New Mexico State University, has written an informative article on fatty acids and related health concerns with fat and trans fats.

"Status of the Food Industry" survey will be sent out to food processors in New Mexico, Texas, Colorado, Utah, and Arizona in mid May 2004. I am working with Dr. Jay Lilywhite to determine what factors make a food business successful.

This spring, NMSU hosted two Better Process Control School programs. Our Spanish course brought 25 students from Mexico, Puerto Rico, and Peru. Our English course attracted students from Utah, Colorado, Texas and many parts of New Mexico. This program continues to serve the needs of the Southwest Region.

Our departmental offices at NMSU will be under construction starting May 18 through August 1, 2004. Please be patient with my response to your requests.

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IDEAS for Food Processors

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Editor: Nancy C. Flores, Ph.D.

Nancy Flores

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Calendar of Upcoming Events

Meetings & Conferences— 2004

- May 17-20:** 21st Aseptic Processing and Packaging Workshop. Purdue Univ. Call (800) 359-2968, e-mail bbmeyer@purdue.edu or bscharf@purdue.edu, or visit www.foodsci.purdue.edu.
- May 18-19:** Pennsylvania Associate of Milk, Food, and Environmental Sanitarians (PAMFES). Penn. State Univ. Call 814-865-8301 or 877-778-2937 or e-mail shortcourse@psu.edu.
- May 25-27:** Uniform Code Council's 2004 U Connect Conference: Connecting People, Process, and Technology. Anaheim, Calif. Call (609) 620-4543, e-mail terman@uc-council.org, or visit www.uc-council.org/uconnect.
- May 28-30:** International Congress of Dietetics. Chicago, Ill. Call (312) 899-4832 or e-mail rcruz@eatright.org.
- June 6-8:** IDDBA's Dairy-Deli-Bake 2004. Washington, D.C. Call (608) 238-7908 or visit www.iddba.org.
- June 8-10:** National Confectioners Association's 2004 ALL CANDY EXPO®. Chicago, Ill. Visit www.AllCandyExpo.com.
- June 12-14:** Lifestyle Events Inc.'s Great American Dessert Expo and Coffee Fest. Las Vegas, Nev. Visit www.dessertexpo.com or www.coffeefest.com.
- June 20-23:** Congress: Food Science and Food Biotechnology in Developing Countries. Durango, Mexico. Call 52(618) 818-6936, e-mail meeting_dgo@prodigy.net.mx, or visit www.itdposgrado-bioquimica.com.mx, or www.aocs.org/meetings/soy03.
- July 12-16:** Institute of Food Technologists Annual Meeting and Food Expo. Las Vegas, Nev. Call IFT at (312) 782-8424, fax (312) 782-0045, e-mail info@ift.org, or visit www.ift.org.
- July 16-20:** American Culinary Federation National Convention. Orlando, Fla. Call (800) 624-9458, e-mail memberservices@acfcchefs.net, or visit www.acfcchefs.org.
- Aug. 8-11:** International Association for Food Protection's IAEP 2004, Phoenix, Ariz. Visit www.foodprotection.org.

Workshops & Short Courses—2004

- May 15-16:** Getting Started in the Specialty Food Business Workshop. Univ. of California, Davis. Call (800) 752-0881 or visit www.extension.ucdavis.edu/agriculture.
- May 18:** Wisconsin CIP Workshop. Madison, Wis. Call (608) 263-2015 or visit www.wisc.edu/foodsci.
- May 19:** Dairy HACCP Workshop. Madison, Wis. Call (608) 265-6346 or visit www.wisc.edu/foodsci.
- May 19-21:** HACCP for Fresh-Cut Produce. Univ. of Georgia, Athens. Call (706) 542-2574, e-mail marianw@uga.edu, or visit www.efsonline.uga.edu.
- June 1:** From Recipe to Reality Seminar. Univ. of Nebraska, Lincoln. Contact Arlis Burney at (402) 472-8930, e-mail aburney@unnotes.unl.edu or visit http://fpc.unl.edu.
- June 9-10:** Issues and Solutions for the Food Product Manufacturer. Chicago, Ill. Contact Pauline Galloway at (402) 472-9751, e-mail pgalloway2@unl.edu, or visit www.farrp.org/workshop.htm.
- June 14-17:** Better Process Control School offered in Spanish. Chapman Univ., Orange, Calif. Contact Marilyn Vasconcellos at (909) 371-8995, e-mail vascotech@earthlink.net, or visit www.l.chapman.edu/wilkinson/physci/fsn/shortcourses.
- June 22-24:** Microbiology for Food Processors. Univ. of Georgia, Athens. Call (706) 542-2574, e-mail marianw@ega.edu, or visit www.efsonline.uga.edu.
- July 27-30:** Meat & Poultry Marination Short Course. Univ. of Georgia, Athens. Call (706) 542-2574, e-mail marianw@uga.edu, or visit www.efsonline.uga.edu.
- Aug. 12:** Five-State Beef Initiative Training. Jackson, Mich. Call (527) 347-8117.
- Aug. 17-18:** Milk Pasteurization and Control School. Univ. of Wisconsin, Madison. Contact Scott Rankin at (608) 263-2008 or visit www.wisc.edu/foodsci.

Source: <http://www.ift.org/meetings/courses>

Expect "Status of the Food Industry" survey soon!!!

About the FDA Bioterrorism Regulations...continued

Internet at www.fda.gov/furls, which operates 24 hours a day, 7 days a week. This Web site is available wherever the Internet is accessible including libraries, copy centers, schools, and Internet cafes. In addition to the online help registrants can access at www.fda.gov/furls, there is also a toll-free Registration Help Desk at (800) 216-7331. If a facility does not have reasonable access to the Internet, a paper copy of the registration form may be obtained from FDA by calling the Help Desk.

Please note that registration only means that the owner of the facility has complied with this rule by registering with FDA. Assignment of a registration number does not convey FDA approval or endorsement of the facility or its products.

Failure to register, update, or cancel a domestic or foreign facility in accordance with this regulation is a prohibited act under the Federal Food, Drug, and Cosmetic Act. The Federal government can bring a civil action to ask a Federal court to enjoin persons who commit a prohibited act, or it can bring a criminal action in Federal court to prosecute persons who are responsible for the commission of a prohibited act. If a foreign facility is required to register but fails to do so, food from that foreign facility that is offered for import into the U.S. is subject to being held within the port of entry unless otherwise directed by FDA or

the Bureau of Customs and Border Protection (CBP).

There are a few exemptions in this regulation, including private residences, restaurants, and retail establishments. For a complete list of exemptions and for more information about this regulation, please read our "Fact Sheet on FDA's New Food Bioterrorism Regulation: Interim Final Rule-Registration of Food Facilities" at <http://www.cfsan.fda.gov/~dms/fsbtac12.html>.

Prior Notice of Imported Food

Prior notice applies to food for humans and other animals that is imported or offered for import into the United States. Any individual with knowledge of the required information may submit the prior notice, including, but not limited to, brokers, importers, and U.S. agents.

Prior notice must be received and confirmed electronically by FDA no more than 5 days before arrival and, as specified by the mode of transportation below, no fewer than:

- 2 hours before arrival by road
- 4 hours before arrival by air or by rail
- 8 hours before arrival by water

Prior notice must be submitted electronically through the FDA Prior Notice System Interface at www.access.fda.gov or through CBP's Automated Broker Interface of the Automated Commercial System (ABI/ACS). Both the CBP and FDA systems for prior notice will be available 24 hours a day, 7 days a week for information submission. For technical assistance in submitting prior notice, please call toll-free (800) 216-7331.

Food that is imported or offered for import with inadequate prior notice is subject to refusal and holding at the port or in secure storage.

For additional information, please refer to our "Fact Sheet on FDA's New Food Bioterrorism Regulation: Interim Final Rule-Prior Notice of Imported Food Shipments" at <http://www.cfsan.fda.gov/dms/fsbtac13.html>.

FDA Country of Production (Originating Country)

- **For food in its natural state: the country where the article of food was grown or collected, including harvested and readied for shipment to the U.S.**

—For wild fish or seafood caught or harvested outside the waters of the U.S. by a vessel that is not registered in the U.S.: the country in which the vessel is registered

—For an article of food that was grown in a U.S. Territory: the U.S.

HELP LINES



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COUNTY/CITY AGENCIES

Albuquerque Environmental
 Health Department
 (505) 768-2642

STATE AGENCIES

**New Mexico Department
 of Agriculture**
 Las Cruces, New Mexico
 (505) 646-3007

**New Mexico Department
 of Health**
 Scientific Lab Division
 Pauline Gutierrez
 Albuquerque, New Mexico
 (505) 841-2500

**New Mexico Environment
 Department Food Specialists**
 Albuquerque, New Mexico
 (505) 841-9452

District I:
 (505) 841-9450
 Albuquerque (counties served:
 San Juan, McKinley, Sandoval,
 Cibola, Tarrant, and Bernalillo)

District II:
Anita Roy (505) 425-6764
 Las Vegas (counties served:
 Santa Fe, Los Alamos, Taos, Rio
 Arriba, Union, San Miguel,
 Mora, Harding, Colfax, and part
 of Guadalupe)

District III:
 (505) 524-6300
 Las Cruces, (counties served:
 Catron, Grant, Sierra, Hidalgo
 Luna, Doña Ana, and Otero)

District IV:
 (505) 624-6046
 Roswell (counties served: Curry,
 DeBaca, Roosevelt, Chaves, Lea,
 Quay, Eddy, and Lincoln)

New Mexico Livestock Board
 Meat Inspection Division
 Arthur P. Marquez
 Program Manager
 Albuquerque, New Mexico
 (505) 250-6115

FEDERAL AGENCIES

**United States Department
 of Agriculture (USDA), Dist. 15**
 Boulder, Colorado
 (303) 497-5411
 www.usda.gov

**Animal and Plant Health
 Inspection Service**
 Plant Protection & Quarantine
 (505) 527-6985

Meat and Poultry Hotline
 1 (800) 535-4555

**Food and Drug
 Administration (FDA)**
Devine Koontz
 Food and Drug Administration
 (FDA), Public Affairs Specialist
 Denver, Colorado
 (303) 236-3020

David Arvelo
 Small Business Office
 Southwest Region, FDA
 Dallas, Texas
 (214) 253-4952
Cynthia Jim
 Consumer Safety Officer, FDA
 Albuquerque, New Mexico
 (505) 248-7377

Seafood Hotline
 1-800-FDA-4010

ASSOCIATIONS
**New Mexico Specialty Foods
 Association (NMSFA)**
 Anna Shawver
 (505) 332-2000

Better Process Control Schools Hazard Analysis and Critical Control Points

BPCS

July 26-29, 2004

Louisiana State University
 Department of Food Science
 Baton Rouge, LA 70803
Location: 102 Knapp Hall
Contact: Tara Etheredge
 Tel: (225) 578-6304, Fax: (225) 578-5300

BPCS

August 16-19, 2004

Chapman University
 Food Science and Nutrition
 One University Drive
 Orange, CA 92866
Location: 213 Beckman Hall
Contact: Andres Vasconcellos
 Tel: (714) 628-7255, Fax: (714) 532-6048

HACCP

October 6-8, 2004

NFPA Headquarters
 1350 I Street, N.W. 4th Floor
 Washington, DC 20005
Location: Fourth Floor Conference Room
Contact: Zadia M. King
 Tel: 1 (800) 355-0983, Fax: (202) 639-5932
 URL: <http://www.nfpa-food.org>

**For more information,
 visit the Web site:
[www.fpi-food.org/
 courseschedule.cfm](http://www.fpi-food.org/courseschedule.cfm)**

What You Need to Know About Trans Fats

M. Ann Bock, PhD, RD, LD
Professor, Human Nutrition
New Mexico State
University

Food Labeling

To assist the public in making decisions about the selection and/or consumption of food, the food label must provide the information noted in the example detailed in Fig. 1.

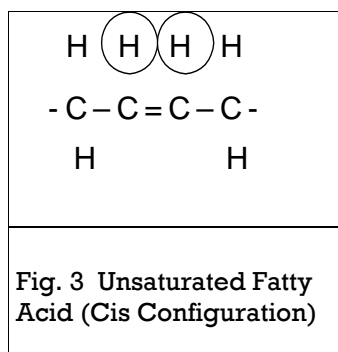
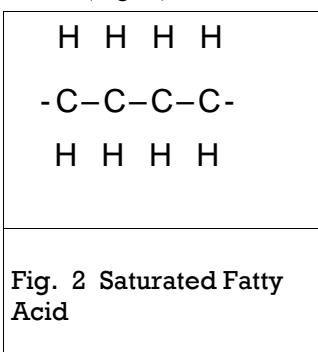
As of July 1, 2006, the label must also include information about trans fats (trans fatty acids).

Whole Milk	
Serving Size 8 fl oz (240mL)	
Servings Per Container 2	
Amount Per Serving	
Calories 150	Calories from Fat 70
% Daily Value*	
Total Fat 8g	12%
Saturated Fat 5g	25%
Cholesterol 35mg	12%
Sodium 125mg	5%
Total Carbohydrate 12g	4%
Dietary Fiber 0g	0%
Sugars 11g	
Protein 8g	
Vitamin A 6%	Vitamin C 4%
Calcium 30%	Iron 0%
	Vitamin D 25%
* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.	
	Calories: 2,000 2,500

Fig. 1 Example of Current Food Label

Fatty Acids

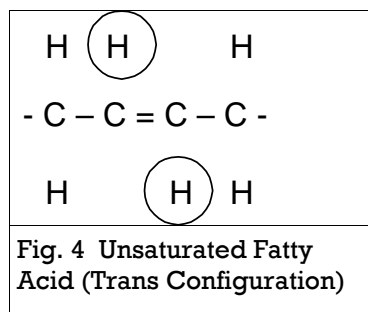
Most of the fat in our diets is made up of fatty acids. Fatty acids are composed of a string of carbons (C) that have hydrogens (H) attached (Fig. 2). There are two kinds of fatty acids, saturated (Fig. 2) and unsaturated (Fig. 3).



The difference from one fatty acid to another is a function of the total number of carbons in the chain and the number of hydrogens attached to each carbon. Saturated fatty acids have only single bonds between each of the carbons in the chain (Fig. 2). Unsaturated fatty acids have one or more double bonds between the carbons in the chain (Fig. 3). In nature, almost all of the hydrogens on an unsaturated fatty acid are attached to the carbons on either side of the double bond in the up (cis) configuration (Fig. 3).

All fats have a combination of saturated and unsaturated fatty acids. The higher the saturated fatty acid content of the fat, the more solid the fat is at room temperature. The higher the unsaturated fatty acid content of a fat source, the more liquid the fat at the same temperature. Examples of fats with high saturated fatty acid contents include: lard, beef tallow and coconut and palm oils. Fat sources with high amounts of monounsaturated (one double bond) fatty acids are canola, peanut and olive oils. Most nut oils (e.g., pecan) are also high in monounsaturated fatty acids. Sources of fat with large amounts of polyunsaturated (two or more double bonds) fatty acids are: soybean, corn, safflower and cottonseed oils.

The number of carbons and the number of double bonds associated with a given fatty acid will significantly affect the properties of the oil (e.g., smoke point, shelf stability) and thus the properties of a product in which the oil is used during processing. The more saturated the fatty acid, the more stable it is related to rancidity. The desire for certain properties and shelf stability has resulted in the alteration of fat sources that are naturally high in unsaturated fatty acids. The most common alteration is the hydrogenation of fat and, thus, fatty acids so that the carbons carry as many hydrogens as possible and, therefore, are changed from unsaturated fatty acids to a saturated fatty acids. This is accomplished by exposing the heated fat to hydrogen in the presence of a metal catalyst like nickel. Such exposure results in the breaking of double bonds and the addition of hydrogen to carbons which in turn results in a fat that is more solid at room temperature. However, it is important to realize that the typical hydrogenation process



does not result in the breaking of all double bonds in all of the unsaturated fatty acids present in the fat. In many cases, one or more of the double bonds that were originally present in a given fatty acid will remain intact. Unfortunately,

the arrangement of the hydrogens around that double bond often does not remain in the cis formation depicted in Fig. 3. In these cases one of the hydrogens

What You Need to Know About Trans Fats...continued

on the carbons connected by the double bond gets moved so that it is in the down position while the one on the other side remains up (Fig. 4). This fatty acid is now known as a trans fatty acid or a trans fat.

Health Concerns Related to Fat and Trans Fats

For years there have been concerns about the amount and kinds of fats in the American diet. This is because high amounts of fat in the diet, elevated amounts of saturated fat and excess calories are thought to increase the risk of elevated total blood cholesterol and low density lipoprotein (LDL) cholesterol ('bad' cholesterol). As a function of this increased risk, various health-related entities have recommended that Americans limit the percentage of total calories that come from fat to 30 percent or less with 10 percent or less of the calories consumed being derived from saturated fatty acids. Both of these recommendations are, in part, the reason that total fat grams, calories from fat and grams of saturated fat have to be listed on the food label (Fig. 1).

As noted above, there is concern about the amount of saturated fat in the diet. We get saturated fat in the diet two ways: first is from foods that contain fat; the second is from foods that contain or are made from modified fats, especially those made with hydrogenated fat. Not only are these foods adding saturated fat to the diet; those made with modified fats are adding trans fats in addition. The saturated fats produced in the hydrogenation process add to the risks noted above. It is now thought that trans fats play a role in

increasing the risk of having elevated cholesterol and higher levels of LDL cholesterol, thus potentially increasing the risk of developing cardiovascular disease. However, contrary to what is noted with saturated fats, trans fats also appear to result in a lowering of the high density lipoprotein (HDL) cholesterol ('good' cholesterol). These alterations thus result in a higher LDL to HDL ratio, which increases the risk of coronary heart disease. Such concerns have been most of the bases for requiring the reporting of trans fat content on the label in 2006.

Processor Awareness of Trans Fats and Alternatives

When selecting ingredients for a product, processors need to be aware that hydrogenated fats are not the only source of trans fats. Anaerobic bacteria in ruminant animals are also capable of making trans fats, which can then become incorporated in the fat of the food involved. However, in contrast to the amount of trans fats being derived from hydrogenated fats, these are relatively minor sources of these fatty acids.

Because of growing concerns about trans fats, European producers have developed trans-free margarines, which are also low in saturated fats. Recently these products have become available in the United States. However a large share of what is on the market is in the form of stick margarine, which does not address the issue of trans fats coming from baked goods, fast foods. Especially things like French fries and other prepared foods.

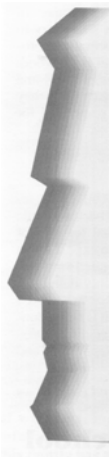
Protein Alternatives To Soy

If you are trying to increase the protein content of your product and you have reached the limit of tolerance for soy in texture or flavor, consider other plant sources of protein. Rice protein is highly digestible and is considered a complete protein providing both essential and non-essential amino acids. Rice protein should also be considered for those who have food allergies or in liquid nutrition for infants or elderly. It can be used in a variety of products such as energy bars, meal replacement systems, and baked goods. Another grain protein, textured dry wheat protein can be used to extend or replace meat protein, having a fibrous texture that simulates both meat and textured

**“Improve yield and cost with
unconventional plant protein.”**

soy. Use of these alternative proteins to improve nutrient content, flavor, and texture may also improve yield and reduce formulation costs.

(Source: “Choosing new alternatives to alternative ingredients” by Donald Pszczola. *Food Technology*, Oct. 2003, vol 57 no 10, p. 54-69.)



New ideas?

Address Change/Corrections? Suggestions/Comments? Subscription?

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