Safe Food Storage

CONSUMERS must monitor the safety of food once it is purchased. As consumers, we must ensure that food remains safe while stored at home. Storage responsibilities include safe packaging and storage in refrigerators, freezers, and dry storage areas. To reduce food decay and spoilage, consumers must monitor the length of time food is stored, maintain optimal (best) temperatures, control pests, and package food properly.

Objective:

Describe safe food storage in the home.

Key Terms:

food decay
food spoilage

Understanding Safe Food Storage

Agencies of the federal government—USDA, FDA, and the EPA—exist to ensure safe food for the general public. However, it is the consumer's responsibility to store food properly and safely as well as to identify potential food storage problems when food is brought into the home.

FOOD STORAGE AREAS: COLD AND DRY

Food processors and handlers go to great lengths to ensure food safety. In fact, some agencies of the federal government exist to ensure food safety. However, all these agency safeguards cannot protect food when it reaches homes. Consumers must practice safe food handling and

storage procedures to ensure foods are safe for their families to consume. A critical part of ensuring food safety is proper storage. The type of food determines proper storage. For example, when frozen food is purchased, it must be stored in a freezer unless it is intended for immediate use.

FIFO

The FIFO rule—First In, First Out—protects food safety and food quality. New food purchases are placed behind older purchases so the oldest food items are used first. For the safety of all food, use this rule in cold and dry storage. When purchasing from a warehouse club, or with any bulk purchase, label food (including canned foods) with the date it was purchased and note the use-by date to ensure proper food safety and freshness.

Refrigerators

Refrigerators store foods at or below 40°F (but above freezing). Milk, cheese, eggs, some vegetables, and some fruits are commonly stored in the refrigerator. Remember that refrigerators are not appropriate for long-term food storage because refrigeration does not prevent food decay and spoilage. Refrigeration just slows food decay and spoilage processes. **Food decay** is the process of foods naturally decomposing and deteriorating. In contrast, **food spoilage** is the process by which foods become unsafe to eat. Food spoilage is any harmful or detrimental change in the tactile, olfactory, visual, or flavor of a food that makes that food unsafe and/or unappetizing to eat. Also, to prevent contamination in the refrigerator, place fresh meat or meat dishes on the lowest shelves to prevent meat juices from dripping into or onto other food.

FIGURE 1. Freezer burn developed on this ice cream due to poor packaging and/or extensive storage time at 0° or below. To prevent freezer burn, place plastic wrap that touches the surface of the ice cream, and then cover the container with a second layer of protection (e.g., a freezer bag or tight-fitting lid). Freezing the remaining ice cream immediately after dipping helps prevent freezer burn.

Freezers

Freezers are used to store foods at or below freezing. Most freezers are set to keep the temperature at or below 0°F. Meat, seafood, poultry, vegetables, and fruits are commonly stored in freezers to enhance the amount of time food may be stored safely. As with refrigerators, freezers do not prevent food decay and food spoilage. Airtight packaging is necessary to preserve freshness and to prevent freezer burn.

UNDER INVESTIGATION...

LAB CONNECTION: Food Storage Experiments

Search "Food Storage & Packaging—Science Fair Projects and Experiments" at http://www.juliantrubin.com/fairprojects/food/food_storage_packaging.html. The site has a lot of simple food storage experiments. In one experiment, dried beans are used to identify the effect of heat, light, and water on food decay. Ten dried beans are used as a control. They are placed in a plastic bag and are stored in a cool dry place. The remaining beans are soaked overnight, and 10 of the soaked beans are placed in three additional plastic bags without extra water or air. One bag is placed in a warm and well-lit place. Another bag is placed in a warm, dark place. The last soaked bag of beans is refrigerated. After one week, compare the bags of beans.

Storing microwave popcorn bags is another experiment that compares best food storage. In this experiment, one bag of microwave popcorn is frozen, another is refrigerated, and the last one is left on the counter. After bags spend 24 hours in the freezer and the refrigerator, pop the popcorn, and count the number of un-popped kernels. Compare the counts of each bag to make your analysis of which form of storage is best for microwave popcorn. The bag with the fewest un-popped kernels is the winner.

Dry Storage

Cabinets and pantries are used to store dry foods in boxes, bags, and cans. Dry food storage requires adequate ventilation and the absence of moisture. After all, microorganisms need food, moisture, and warmth to grow. Using proper storage techniques also helps eliminate pests (e.g., roaches and rodents) from invading cabinets and pantries.

SAFE FOOD STORAGE PROCEDURES

Proper food storage includes following timeframes, temperature ranges, pest control, and packaging procedures.

Timeframes

Foods slowly decay regardless of the storage method, including frozen and canned storage methods. Watching expiration or "best used by" dates will enhance the quality of food prepared for the family. Generally, foods may be stored in the refrigerator for a few weeks or in the freezer for a few months. Properly canned foods can be stored for up to a year. These are general rules and do

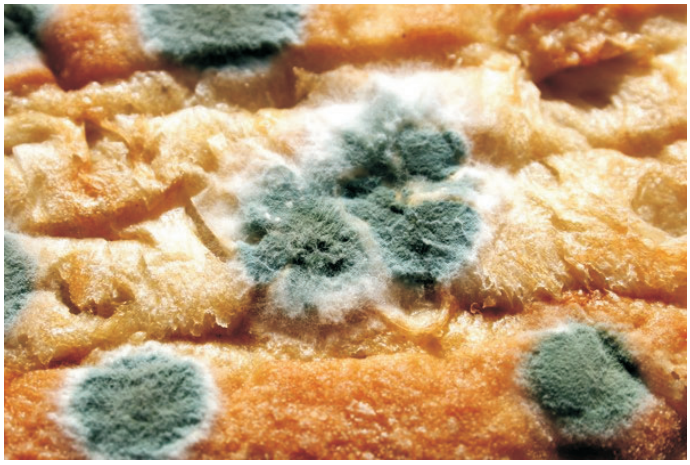

FIGURE 2. This bread roll was stored too long and has become moldy.

BROADENING AWARENESS...

AMAZING ASPECTS:
Food and a Weather Emergency

The Keep Food Safe website—Your Gateway to Federal Food Safety Information—is at http://www.foodsafety.gov/keep/index.html. The site offers general information about determining which foods should be thrown out and which are safe to consume. The website offers recommendations about food safety decisions following a power outage due to a weather emergency. The site also provides recommendations to keep or throw out food when internal temperatures reach 40°F or above for two hours or more. For example, foods that should be thrown away are meats, lunchmeat, bacon, opened canned meats, and any food that touched raw meat juices. Some cheeses are safe, but others must be thrown away. For instance, soft, low-fat, and shredded cheese must be thrown out, but hard block (rind) cheese and canned Parmesan cheeses are safe. Milk and fresh eggs must be thrown out, but butter and margarine are safe. Open the "In an Emergency" link to review a chart on refrigerated and frozen food safety during an emergency. The link provides guidelines about keeping food safe during and after a hurricane, flood, fire, or power outage.

not apply to all foods. When in doubt, do not consume older foods. The cost of discarding the item is much less than hospital bills incurred for illness.

Temperatures

All food items must be stored at proper temperatures. Bacterial growth is rapid between 60°F and 140°F. Allowing foods to remain at temperatures in this range greatly increases the risk of food-borne illness. As a general rule, keep hot foods hot and cold foods cold. It is advisable to keep a thermometer in the refrigerator and freezer to monitor air temperatures. Also, do not overload refrigerators and freezers, as this practice prevents adequate air flow around foods and can create "hot spots" where microorganisms could grow.

Pest Control

Household pests are a serious threat to food safety and quality. Insects and rodents, such as cockroaches and mice, can carry diseases. In addition, ants consume foods and make them unsuitable for human consumption. Yet extreme care should be taken when using pesticides near food.

FIGURE 3. Protect food from household pests and pesticides. To prevent pests from contaminating food and spreading disease, ensure that doors and screens are in good repair, lids are tight-fitting and secure, and home access points are closed off.

DIGGING DEEPER...

UNCOVERING ADDITIONAL FACTS: Food Tampering

Although food tampering is rare in the United States, you still need to be aware of potential problems. Check out "Food Tampering: An Extra Ounce of Caution" at http://www.fda.gov/Food/ResourcesForYou/Consumers/ucm079137.htm. It offers tips to keep food safe. Some of the tips include checking the food packaging integrity in the grocery store. For example, make sure the anti-tampering devices are in place. Do not purchase open, torn, or damaged products. The FDA recommends checking the sell-by date. The following is a quote from Four Steps to Report a Suspect Product:

1. If you suspect product tampering at the grocery store, report it to the store manager.
2. If you suspect a commercial food product has been tampered with, report the suspected tampering incident to your local police department.
3. If the suspected tampered food product contains meat or poultry, call the U.S. Department of Agriculture's Meat and Poultry Hotline. The number is available online.
4. If the suspected tampered food product does not contain meat or poultry (e.g., seafood, produce, or eggs), notify the Food and Drug Administration. For emergency questions, call the FDA's 24-hour emergency number. For non-emergency questions, call the FDA Food Information Line. Use a search engine to locate the current phone number.

Packaging

Properly packaged food will store longer than improperly packaged food. Airtight packaging prevents microorganisms from causing food spoilage or food decay. To eliminate food spoilage and decay, tightly seal and reseal foods.

FIGURE 4. When leftover pizza is refrigerated in the box for two days, it dries out. How could the pizza be packaged to prevent it from drying out in the refrigerator?

Summary:

Follow safe food storage procedures for refrigerators, freezers, and dry storage areas. To keep food safely stored, you must follow the recommended length of storage, temperature, packaging, and pest-control measures. Refrigerators store foods at or below 40°F (but above freezing). Freezers store foods at or below freezing, and most are set at or below 0°F. Airtight packaging is necessary to preserve a food's freshness and to prevent freezer burn.

Dry goods—boxed, bagged, and canned—are stored in cabinets and pantries at room temperature, with good ventilation and away from moisture.

Checking Your Knowledge:

1. Who is responsible for keeping food safe at home?
2. At what temperature should refrigerators be set to keep food safe?
3. Explain how a refrigerator slows food decay and food spoilage.
4. At what temperature should freezers be set to store food safely?
5. How does a homeowner prevent pest infestations?

Expanding Your Knowledge:

Check out your home food storage plan. Do a spot check of expiration dates in the refrigerator, freezer, and cabinet or pantry storage. Do you think FIFO is followed in your home? If not, what could be done to put that practice in place? Write some general rules for safe food storage, and put them on your refrigerator.

Web Links:

FIFO
http://www.youtube.com/watch?v=kfD4hf0RAco

Food Storage Guidelines
http://whatscookingamerica.net/Information/FreezerChart.htm

Safe Food
http://www.foodsafety.gov/keep/index.html

Refrigerator and Freezer Storage Chart
http://www.fda.gov/downloads/Food/FoodborneIllnessContaminants/ucm109315.pdf