January 2005

Food Facts For You!

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New Year's Resolutions to Keep You Safe; Johne's Disease: A Disease of Cattle with Food Safety Implications; Barn to Plate: Processing Chickens at Home; Heating Eggs for Use in Uncooked Ice Cream Base, Egg Nog, or Icing; What's On Your Mind? (food stored in opened cans; plastic bags for storing food; cooking in low temperature ovens; crock pot cooking; safe methods of thawing meat; new anti-viral facial tissues).

New Year's Resolutions to Keep You Safe

(Note: *The USDA/FSIS offers the following hints for family cooks and take-out consumers for a food-safe 2005.*) New Year's resolutions often begin with "I will lose five pounds" or "I promise to exercise." But there are other resolutions that could save you a trip to the doctor or, worse, the hospital. These resolutions may be easier to keep - for yourself and your family.

USDA advises putting these "food safety" resolutions at the top of your 2005 New Year's list:

- **I will buy and use a food thermometer.** It's the only way to know if meat, poultry and fish are cooked safely. You can't tell just by looking.
- **I will use an appliance thermometer in the refrigerator and will check to make sure that the temperature is 40°F or below.** In the freezer, I will make sure the thermometer reads 0°F or below. Bacteria grow rapidly at temperatures above 40° F.
- **I will not leave pizza sitting out on the table or my "doggie" bag in the car overnight.** Foods should not be left out more than two hours at room temperature, or 1 hour if it is over 90° F. Remember: When in doubt, throw it out.
- **I will not defrost my turkey in the garage or in the trunk of my car.** The only USDA-approved way to defrost food is in the refrigerator, in cold water or in the microwave.
- **I will wash my hands and all food preparation surfaces with soap and water before and after touching raw meat, poultry or fish.** Bacteria on raw meat, fish or poultry can contaminate other foods such as bread or lettuce that will not be cooked.
- **I will not feed my dog or cat old "leftovers" or "take-out" food that's no longer fit for people.** Animals can also be stricken with foodborne illnesses.
- **I will not leave "take-out" or "ready-to-eat" food in the refrigerator so long that it's forgotten.** You can't tell by looking at or smelling if a food is unsafe. Throw it away after three days and never taste a food that you don't know what it is or how long it has been in the refrigerator!
- **I will not lick the spoon or the bowl of homemade cookie dough or cake batter made with raw eggs.** *Salmonella* - a very unpleasant and potentially dangerous

illness can come from eating raw eggs - even one taste of raw dough could contain harmful bacteria.

- **When grilling outdoors, I will use a clean plate for the cooked hamburgers, hot dogs or other meat or fish.** I won't use the same plate that held raw meat. Juices from raw meat, poultry or fish could contaminate your cooked food.
- **I will separate cooked foods from uncooked foods when preparing a meal**, including using separate cutting boards and knives. Cross-contamination could cause harmful bacteria from one food to be transferred to another food.
- **I will always put an ice pack in my child's lunch box and my own lunch bag if I have a perishable lunch**, **such as meat, poultry, fish, milk or eggs.** Foods in lunch boxes sitting in warm classrooms or offices could result in foodborne illnesses. Children under the age of 10 are the most vulnerable.
- **I will not "save money" by buying deeply dented cans or cracked jars.** Never use food from badly damaged containers. This applies to containers that are leaking, bulging or badly dented. Do not use food from cracked jars with loose or bulging lids, canned food with a foul odor or any container that spurts liquid when you open it. It's not worth taking a risk to save a few pennies.
- **I will put meat and poultry packages in plastic bags at the meat counter before putting them in my grocery cart.** Leaking packages from meat or poultry could contaminate other foods in the cart, leading to foodborne illnesses.

The USDA Meat and Poultry Hotline is only a phone call away: toll free at 1-888-674-6854, TTY: 1-800- 256-7072. You can call the year-round hotline Monday through Friday from 10 a.m. to 4 p.m. EST (English or Spanish). Listen to timely recorded food safety messages at the same number 24 hours a day. Do not guess about food safety, the health of your family and friends may be at stake.

Johne's Disease: A Disease of Cattle with Potential Food Safety Implications

Johne's (pronounced "Yo-nees") **disease** is a contagious bacterial disease of animals. A German veterinarian first described the disease in a dairy cow in 1895; his name is used as the common name for the disease. Johne's disease occurs in a wide variety of animals, but most often in ruminants such as: cattle, sheep, goats, deer, antelope, and bison, with cattle being the most common hosts for this bacterium.

What causes Johne's disease? The bacterium that causes Johne's disease is named ***Mycobacterium paratuberculosis***, often abbreviated as *M. paratuberculosis*. *M. paratuberculosis* is a relative of the bacterium that causes tuberculosis in humans (*Mycobacterium tuberculosis*). *M. paratuberculosis* can replicate only when it is in animals: it cannot multiply in nature, outside the animal. However, if soil or water is contaminated with this bacterium, it can survive there for over a year because of its resistance to heat, cold and drying.

What are the signs of Johne's disease? There are two primary signs of *M. paratuberculosis* infection in animals: diarrhea and rapid weight loss. In some animal species, like sheep and goats, diarrhea is less common. In general, animals with Johne's disease "waste away" despite their continuing to eat well. The bacterium infects the intestine of the animal, causing inflammation and preventing absorption of nutrients. Because of the slowly progressive nature of the infection, signs of Johne's disease are usually not seen until animals are adults. Since the signs of Johne's disease can be confused with the signs of several other diseases, a diagnosis can be confirmed only by use of laboratory tests.

What are the implications for dairy cattle? Johne's disease occurs worldwide. In the U.S. it is estimated that 7.8% of the beef herds and 22% of the dairy herds are infected with *M. paratuberculosis*. Johne's disease typically enters a herd or flock of animals when an infected, but healthy-looking, animal is purchased. The infection then spreads to other animals, often without the owner's being aware of it. Individual animals get infected by close contact with other infected animals that shed the bacterium in their manure. Most often, the infection is acquired by eating material contaminated with *M. paratuberculosis* when animals are very young. Young animals are far more susceptible to infection than are adults. Ingestion of the bacterium occurs when the newborn's environment is contaminated with manure from an infected adult animal, or by drinking milk from an infected animal. The milk may become contaminated from the environment (manure-stained teats) or, in the advanced stages of the infection, the bacterium is shed directly into the milk. After infection, many months or years go by until the infected animals shows signs of Johne's disease. The disease does not respond to antibiotic treatment.

Can humans get Johne's disease? This is a very controversial subject. There is a human disease called Crohn's disease that resembles Johne's disease. Crohn's disease, an inflammatory bowel disease, affects at least one million persons worldwide. It is a chronic diarrheal disease that has no known cause and no known cure. Individuals aged 15 to 35 are most commonly affected. Recent reports in the medical literature indicate that 30 to 75% of patients with Crohn's disease test positive for *M. paratuberculosis*. However, no connection has been shown between contact with animals with Johne's disease or milk consumption and Crohn's disease.

Implications for food safety. The link between a known, but difficult to detect, animal disease and a human disease is tenuous. However, those scientists who have studied *M. paratuberculosis* have shown that it is quite heat stable, likely surviving the traditional pasteurization process. A recent study by Dr. Jay Ellingson of the Marshfield Clinic, Marshfield, WI found that, of 702 samples of retail whole pasteurized milk tested, 2.8% contained viable (living) *M. paratuberculosis*. More research is needed to establish whether there is a food safety risk from drinking milk from animals infected with *M. paratuberculosis*.
For more information, see the **Johne's Information Center** from the University of Wisconsin – School of Veterinary Medicine http://www.johnes.org/index.shtml

Barn to Plate: Processing Chickens at Home

Peggy Olive (Richland County) inquired about plucking and cleaning chickens. Since others of you may come across similar questions, I wanted to share the information that we received from Animal Scientist **Dr. Ron Kean**. Birds are scalded in hot or very hot water; the hot water relaxes the muscles that hold the feathers, making them easier to pluck. Some typical times and temperatures are:

Scalding		
Hard scald	160 – 180° F	30 – 60 seconds
Sub scald	138 – 140° F*	30 – 75 seconds
Semi scald	123 – 139° F**	30 – 75 seconds

*Dr. Kean recommends this for chickens and turkeys
**4 parts boiling water to 3 parts cold water gives about 135°F

As Dr. Kean notes, “The important thing is that you don't leave it in long enough that the skin tissue starts to be damaged. If the skin tears easily during plucking, it's been in too long.” Birds that have been scalded and plucked can also be dunked in paraffin wax to get rid of the ‘pin-feathers’. The paraffin wax is typically used for waterfowl. The paraffin will get rid of the "pin-feathers" that are more common on waterfowl and that are very difficult to pluck by hand. Dr. Kean suggests that the carcass is usually dunked in the paraffin and then removed so the wax will harden. It may be necessary to dunk it a couple of times to get a good layer.

Bird carcasses, once they are plucked ("naked") are typically dunked in cold water to cool the body down more quickly. After evisceration, they can again be put in cold water to cool, dried and wrapped for refrigeration. Dr. Kean suggests that freshly eviscerated poultry carcasses be refrigerated for about 24 hours after processing and before freezing. He notes that their can be some issues with toughness if they are frozen too quickly.

Heating Eggs for Use in Uncooked Ice Cream Base, Egg Nog, or Icing

Note: This information was shared by email in December 2004. It is repeated here for your files, and will be archived in the Food Facts subject index.)

The **American Egg Board** offers information on how to properly heat eggs (whole, yolks or whites) before using in the preparation of uncooked ice cream base, egg nog, or icing that receives no further heat treatment:

Cooking Whole Eggs for Use in Recipes - As a nutritious combination of egg whites and yolks, whole eggs should be fully cooked for assured safety in recipes that call for raw or lightly cooked eggs. The following method can be used with any number of eggs and works for a variety of recipes.

- In a heavy saucepan, stir together the eggs and either sugar, water or other liquid from the recipe (at least 1/4 cup sugar, liquid or a combination per egg). Cook over low heat, stirring constantly, until the egg mixture coats a metal spoon with a thin film or reaches 160°F. Immediately place the saucepan in ice water and stir until the egg mixture is cool. Proceed with the recipe.

Cooking Egg Yolks for Use in Recipes - Because egg yolks are a fine growth medium for bacteria, cook them for use in mayonnaise, Hollandaise sauce, Caesar salad dressing, chilled souffles, chiffons, mousses and other recipes calling for raw egg yolks. The following method can be used with any number of yolks.

- In a heavy saucepan, stir together the egg yolks and liquid from the recipe (at least 2 tablespoons liquid per yolk). Cook over very low heat, stirring constantly, until the yolk mixture coats a metal spoon with a thin film, bubbles at the edges or reaches 160°F. Immediately place the saucepan in ice water and stir until the yolk mixture is cool. Proceed with the recipe.

Cooking Egg Whites for Use in Recipes - Cooking egg whites before use in all recipes is recommended for full safety. The following method can be used with any number of whites and works for chilled desserts as well as Seven-Minute Frosting, Royal Icing and other frosting recipes calling for raw egg whites.

- In a heavy saucepan, the top of a double boiler or a metal bowl placed over water in a saucepan, stir together the egg whites and sugar from the recipe (at least 2 tablespoons sugar per white), water (1 teaspoon per white) and cream of tartar (1/8

teaspoon per each 2 whites). Cook over low heat or simmering water, beating constantly with a portable mixer at low speed, until the whites reach 160°F. Pour into a large bowl. Beat on high speed until the whites stand in soft peaks. Proceed with the recipe.

- Note: you must use sugar to keep the whites from coagulating too rapidly. Test with a thermometer as there is no visual clue to doneness. If you use an unlined aluminum saucepan, eliminate the cream of tartar or the two will react and create an unattractive gray meringue.
- Making an Italian meringue by adding hot sugar syrup to egg whites while beating them does not bring the egg whites to much above 125° F and is not recommended except for dishes that are further cooked. If, however, you bring the sugar syrup all the way to the hardball stage (250° to 266° F), the whites will reach a high enough temperature. You can use a sugar syrup at hardball stage for Divinity and similar recipes.

What's On Your Mind?

(*The last month has been one for very interesting questions. Here are some questions that I have responded to that you might find interesting.*)

Can opened canned items be safely stored in the refrigerator? How cans are made has changed dramatically over the last several decades. Cans used to be made from steel and/or tin, and now more routinely are made from aluminum. All cans have an internal 'lining' that gives the inside of the can a shiny appearance- perhaps white or gold, or a clear enamel. This 'lining' helps to prevent the food in a can from interacting with the metal of the can itself. If this lining is, for some reason, damaged or isn't applied carefully when the can is manufactured, then the food can contact the metal of the can. When the can is opened, it is more likely that the contents will react with the metal since the oxygen in the air tends to enhance the reaction of the food with the metal. The exposed metal can cause changes in color and flavor in food, especially in acidic foods like canned fruits or tomato sauces. These are, however, quality changes. Storing food in opened cans in the refrigerator should no longer be a safety issue. That said, I always recommend that people remove food from opened cans and store it in glass jars or plastic containers. The metal cans really weren't designed to store leftovers, and they usually don't have a good lid (and often no lid at all) and covering food in the refrigerator is a good protection against cross contamination. But, if for some reason you forget and store food in an opened can, it should not be harmful.

Is it safe to store food in plastic bags designed to hold newspapers, trash, or other items? Storing food in plastic bags that held newspapers, plastic trash bags or other similar plastic bags is specifically discouraged because these plastic bags are not made of food-grade material. Because these bags were not designed to hold food, it is possible that they are not compatible with food and chemicals from the plastic material can leach or migrate into the food. This would be more of a problem with acidic or liquid food products. It's best to simply recycle these bags.

Interesting, food safety experts would also discourage **reuse** of any type of plastic bags such as bread bags or food storage bags. This is because it's nearly impossible to clean a plastic bag completely. (I know that I am often guilty of forgetting this simple food safety rule. When I use up the end of a sandwich loaf, I often use the bag to carry the next day's lunch.) Thanks to **Gayle Rose Martinez** for this question!

Can meat be safety cooked in a low temperature oven? Jane Jensen (Sheboygan County) asked about a recipe for "Stay in Bed Stew" for the local HCE cookbook. The

recipe calls for stew meat and a variety of vegetables with tapioca for thickening. The ingredients are put in a casserole, covered tightly and baked at 250°F for 5 hours. Is this safe? Jane correctly noted that the USDA minimum for cooking turkey or roast is an oven set at 325°F.

While we normally indicate 325°F as a minimum oven temperature, recent research leads me to say that I think that the **stew recipe is safe** (it's using an oven sort of like a crock pot). Here's why: In a covered casserole such as this, the dish is being cooked in a moist heat environment; whereas, when a roast or turkey is cooked in an oven, the environment is much drier. Moist heat is more lethal to microbes than dry heat because moist air carries heat more effectively than dry air. Think of when you hold your hand over a boiling kettle, it's impossible to hold it there for long without really burning your skin - and the steam is a temperature of roughly 212° F. Now think of an oven, perhaps set at 325°, you can put your hand in the oven and, as long as you don't touch any metal, you can hold it in the oven for much longer than you can hold your hand over the steam…and yet the steam is a good 100° cooler! The difference is the amount of thermal energy in the moist steam versus dry air. So, I would say that the recipe is safe. But…..would including a recipe like this in a cookbook cause confusion? Do consumers understand the difference between moist heat and dry-heat cooking? If they do, then sharing a recipe like this would be fine. Otherwise, I would suggest cooking the stew in a crock pot.

Mary Lestrud passed on a similar question related to crock pot cooking. We know that crock pots don't reach temperatures of 325° F, and yet they are safe to use for cooking stew. The same principle applies as in the oven example, above. A crock pot uses moist heat which kills bacteria at lower temperatures than dry heat. A crock pot also cooks food for an extended period of time and there is a time/temperature relationship to microbial destruction: certain long time, low temperature and short time, high temperature combinations are equivalent. For tips on safely cooking food in slow cookers, see the archives for Wisconsin FIRST (look under Slow Cookers) http://www.wisc.edu/foodsafety/ffBackIssues_subject.htm or the USDA web site: http://www.fsis.usda.gov/factsheets/focus_on_slow_cooker_safety/index.asp

Can you leave a chicken out to thaw at room temperature, as long as you cook it well enough? Renee Vertin (Washington County) was teaching food safety to a group of teenagers, and they challenged her with this question. One answer to the teenagers' question is that some microorganisms produce heat-stable toxins that are not destroyed on heating. This is most often the case when food is contaminated with *Staphylococcus aureus* (Staph). When Staph grows in contaminated food left out at room temperature, it produces a toxin, or poison, that is very difficult to destroy, even thorough cooking will not ensure safety.

Safe thawing was the subject of discussion on a food safety listserv recently, and this led me to do some library work. Research by **Dr. Pete Snyder** at the University of Minnesota looks at safe methods for thawing chicken. Frozen raw chickens (~4 pounds each) were thawed by three different methods to study population changes in spoilage bacteria and a type of *Salmonella* during thawing. The three thawing methods were:

- On the counter at room temperature (72° F)
- In flowing water (70° F)
- In the refrigerator (40° F)

The chicken was considered thawed when the temperature inside the breast muscle reached 40° F. The results indicated that:

- Thawing chicken on the counter at room temperature within 14 hours or less to an internal temperature of 40° F is a safe procedure;
- Thawing chicken in flowing water is a safe, rapid method; and
- Thawing chicken in a standard refrigerator at 40° F is a safe method, but the longer period of time needed to reach the thawing endpoint allowed for the growth of cold-tolerant spoilage bacteria.

This research would support at least one option (room temperature thawing for a limited period of time) not currently promoted in our teaching materials. (S.M. Jimenez *et al.* 2000. The Effect of Different Thawing Methods on the Growth of Bacteria in Chicken. Dairy, Food and Environmental Sanitation 20:678-683.)

More recently, research by **Dr. Steve Ingham** at the UW-Madison has shed further light on the issue of safe thawing methods for meat. Whole chicken (3.5 pounds) and ground beef (1 or 3 pound packages) were inoculated with *Salmonella*, *E. coli* O157:H7, and *Staphlococcus aureus* and frozen. Products were then thawed at 72° F or 87° F for 9 hours. The results indicated that there was no pathogen growth:

- On whole chickens thawed for 9 hours at 72° F or 87° F.
- On 3 pound packages of ground beef thawed for 9 hours at 72° F or 87° F.

There was only slight pathogen growth on the surface of 1 pound packages of ground beef thawed for 9 hours at 72° or 87° F.

Based on these results, the researchers suggest:

- Thawing frozen whole chickens (3.5 pounds each) at temperatures under 87° F for less than 9 hours is a safe process.
- Thawing ground beef (1 or 3 pound packages) at 72° F for less than 9 hours is also a safe process.
- Thawing smaller portions of meat at higher temperatures and/or for longer periods of time at room temperature is not recommended.

This work is important because it takes into account the growth of *Staphylococcus aureus* (Staph). Since Staph did not grow under these conditions, thorough cooking would render the products safe to consume, even when thawed at room temperature. (S.C. Ingham, *et al.* Growth of *Salmonella* spp., *Escherichia coli* O157:H7, and *Staphylococcus aureus* During Thawing of Whole Chicken and Retail Ground Beef Portions at 22°C and 30°C. submitted, 2004. J. Food Protection.)

The bottom line: Thorough cooking remains a key step in ensuring the safety of meat products.

Will this research find its way into our teaching materials? Our teaching materials are based largely on educational materials from the United States Department of Agriculture. In order to offer a clear, consistent message, we will continue to support the USDA's recommendation to thaw meat in the refrigerator, in cold water in the sink, or in the microwave. I had reason to call on this research as I responded to an individual consumer who contacted my office 'after the fact'. If you have similar challenging situations, I will be happy to work with you to suggest options for your response!

Have you seen the new boxes of Anti-Viral Kleenex® tissue? My family had slight colds and sore throats over the holidays, so I ran to the store for facial tissue. I

noticed that Kleenex has a new line of Anti-Viral facial tissues. The box says that the tissues kill 99.9% of cold and flu viruses. Would it work? In the interest of science, I bought a box and my husband (the microbiologist) and I took some time to read the fine print. The tissues "contain a moisture activated middle layer that kills 99.9% of cold and flu viruses in the tissue within 15 minutes." The tissues are virucidal against: rhinoviruses Type 1A and 2 (leading cause of the common cold), Influenza A and Influenza B (causes of the flu); and Respiratory Syncytial Virus (RSV- the leading cause of lower respiratory infection in children. The active ingredients are 2% sodium lauryl sulfate (a surfactant) and 7.5% citric acid (lemon juice). So…..would they work? There are two reasons that I am **not** optimistic about this product. First, my husband said that as a microbiologist, 99.9% of cold and flu viruses is not very many. A microbiologist would need to see 99.999% killed to consider the product effective. Secondly, it's impossible to tell if the active compounds were actually tested in the Kleenex, or in a test tube in a laboratory. Test-tube results sometimes don't mimic the 'real world.' Since it usually isn't appealing to hold a lemon-juice drenched 'regular' tissue to your face, these might be worth a try, recognizing that the acid in the tissues would only kill a small portion of any viruses that may be present. **Proper hand washing is still the best way to prevent the spread of illness, especially this time of year.**

Remember the **news release** archives: http://www.cft.uwex.edu/ces/news/
As we move through the season of winter storms and power outages, remember that there are press releases and other resources on emergency food safety available in the archives. UWEX also has resources on responding to, or preparing for, a natural disaster: http://www.wisc.edu/foodsafety/Educators/wfdisaster.htm .

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