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PREPARING SAFE POULTRY

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It is well known that raw turkey and other poultry are highly contaminated with vegetative pathogens such as *Campylobacter* spp. (80-90%), *Salmonella* spp. (15%), *Escherichia coli* O157:H7 (5%), which are inactivated by cooking to over 130°F for a specified time. Poultry is also contaminated by the spore of *Clostridium perfringens* (40%), which survives the cooking process. There is no effective government program to get poultry growers to control these biological hazards. The government has left it up to the cook to be the hazard controller. The cook must handle poultry safely and destroy or control the pathogens in order to avoid the risk of making consumers ill with diarrhea, vomiting, fever, etc. The following is a step-by-step process for assuring that microbiological hazards are controlled and that the poultry that is served will not make the consumer ill.

1. Purchasing the turkey or chicken

Freezing does reduce the number of vegetative pathogens on the bird a little, but it does not kill all of them and make poultry safe, as cooking does. Of course, there is no growth of pathogens when poultry is frozen below 30°F. However, beginning at 30°F, there is slow growth of *Listeria monocytogenes*, *Aeromonas hydrophila*, and *Yersinia enterocolitica*. The first food safety control point is that the turkey must be thawed so that there is no significant pathogen growth, and the contaminated drip is contained. If the drip is not contained, it can get all over the kitchen and cross-contaminate the inside of the refrigerator. Also, if you buy fresh poultry or a thawed turkey, be very sure that none of the juice drips on any other foods that you purchase.

2. Thawing

The government says that poultry should be thawed in the refrigerator. In today's 40°F refrigerator, this may take 4 to 5 days, and the contaminated drip from the bird can easily contaminate other foods in the refrigerator. One control is to always thaw poultry on the bottom shelf so that there are minimal chances of cross-contamination with the other ready-to-eat food in the refrigerator.

Even better, USDA research has shown that poultry can be safely thawed on the counter. A 12-lb. turkey will take approximately 12 hours to thaw at room temperature. Put it on the counter in the pan that you will cook it in and let it thaw overnight. As long as the surface temperature of the turkey is less than about 50°F, and the time is less than 24 hours, there is essentially no growth of pathogens, and the cooking step easily controls the bacterial hazards. You can also thaw in the sink in flowing water. It controls pathogenic growth, but your sink and kitchen can become contaminated with the pathogens in the drip and sink water.

When you believe that it is thawed all the way to the center, make absolutely sure. To do this, probe the turkey middle with a fork to check for any ice. You do not want to cook a partly

thawed turkey. Many foodborne illnesses associated with turkey cooking are due to the fact that the bird is not totally thawed when it is put in the oven. However, the middle, frozen part never cooks adequately, and pathogens survive in the cavity. The cooking thermometer must measure the temperature of the inside of the turkey to know if it is safe to eat. Typically, the roast thermometer is placed in the thawed breast or leg, which cooks much faster than a frozen center, and the bird will not be safe to eat. In summary, the critical step in thawing turkey is to make sure that the center is thawed and that you minimize getting any drippage on kitchen surfaces.

3. Stuffing

It is better not to stuff the turkey, because it slows cooking. It is best to cook the stuffing in a separate pan. Just put some herbs and spices in the cavity of the bird. They give plenty of flavor during cooking. If you wish to stuff the turkey, however, remember, it is more difficult to heat the middle of the bird thoroughly, and it will take a longer time to cook. It is critical that you destroy the bacteria that are on the inside cavity of the bird.

If you want to stuff the bird the day before it is cooked, make the stuffing with cold water and cold ingredients so that the stuffing is about 50°F when you stuff the turkey. If the temperature is 50°F or less when you stuff the bird, the *Staphylococcus aureus* from the skin on your hands that gets into the stuffing will not multiply and form toxins, and cooking will make the turkey safe. You may use cooked giblets, liver, heart, etc. in the stuffing, but cool them first, before mixing with the 50°F stuffing.

4. Washing the poultry

Do not wash raw poultry before cooking. When you wash poultry, the pathogens contaminate the sink, the faucet, other parts of the kitchen, your hands, etc. Washing poultry greatly increases the risk of foodborne illness from cross-contamination. The critical step is to get the turkey in the oven and kill the pathogenic bacteria as soon as possible.

If you must wash the turkey, it is critically important that, when you are finished washing, you use soap and a lot of water to wash the sink thoroughly and dilute the pathogens to a safe level. It is not necessary, but you may wish to sanitize the sink by using 1 cup vinegar per 1 gallon water. After the vinegar solution is on the clean surface, let it sit for 5 minutes to kill the bacteria. Chemical sanitizers are not recommended, because they are toxic and introduce small poison risks to the kitchen and children in the house.

5. Cooking the thawed turkey

Put the turkey in the oven at 325°F. Preferably, it is not stuffed. Put a thermometer into the breast of the turkey. You can use a traditional, dial-type oven roasting thermometer in the breast (165°F) or leg (185°F). Remember, however, the dial thermometers measure temperature from the tip to 3 inches up the stem, which means that your measurement of doneness is only an average temperature over the 3 inches. If you do not get all 3 inches of the stem into the turkey, you get an inaccurate reading.

If you have stuffed the turkey, you must cook the stuffed bird until the stuffing is above 150°F. This assures a 10,000,000-to-1 kill of *Salmonella* on the inside cavity wall of the turkey. At this point, the breast will probably be 165°F, which is very safe, and the thigh will be about 185°F, which is necessary to make this muscle tissue soft.

The critical temperature and time for cooking the stuffed turkey to assure safety is 150°F in the stuffing or 165°F in the breast.

Pan roasting, covered, is the preferred method, because the bird steams, which cooks it rather quickly, uniformly and very thoroughly, vs. dry, uncovered roasting. To make the turkey brown, in the last 45 minutes, uncover the pan and let the turkey surface dry and brown in the oven. This is a much more assured way to achieve a proper kill of the vegetative bacteria as opposed to cooking the bird uncovered on a shallow pan.

An oven-cooking bag works the same way as a roasting pan and is easy to clean up.

6. Cooking the turkey from the frozen state

A very safe practice is to cook the turkey from the frozen state. Use the same oven temperature, 325°F. Take off the plastic wrap. Cook it in the roasting pan, covered. After about 1 1/2 to 2 hours in the oven, the bird will be thawed. If you want to remove the paper bag of organs and the neck, take some food tongs and simply pull them out. You really do not need to remove the giblets, neck, etc. Then, put the turkey back in the pan, cover, and continue to roast. The end temperature is the same, 150°F for 1 minute in the center or 165°F in the breast and 185°F in the leg / thigh. Total time for a 12-lb. bird is 5 to 6 hours to thaw and cook.

7. Hot holding after cooking

It is much better to get the turkey done a little early and hold it hot, than to be late and try to get it done quickly by turning up the oven. All this does is to make the outside brown. You cannot rush the cooking. Plan so that the turkey is done 30 to 60 minutes before you want to serve. If the oven is available, simply turn the control to 140°F hot hold.

Alternatively, you can put the turkey on the platter, which will let it cool to 150°F, cover with some foil, and return it to the oven at 140°F. Keep the thermometer in the bird. If the temperature of the bird stays above 130°F, there is absolutely no risk, the turkey is totally safe.

You can also hold the turkey in the covered cooking pan on the counter, perhaps with a couple of heavy towels draped over it to keep the heat in. Again, if you keep the temperature of the bird above 130°F, there is no pathogen growth.

8. After cooking

Take the turkey out of the oven with clean utensils. Put it on a platter for service. Now is the time that your hands must be scrupulously clean. Before you start to carve the turkey, you must wash your hands thoroughly to remove any raw food bacteria that have contaminated your hands. Using clean, sanitized utensils, carve the turkey off of the bone. Now it is ready to serve. If there is stuffing, serve it with the turkey.

9. Enjoying your guests

You have about 2 hours of time between removing the turkey from the oven and taking it back to the kitchen after the meal is finished to put the turkey leftovers into the refrigerator. One of the organisms that survives the cooking process is *Clostridium perfringens*. It has a "lag" of about 2 hours before it begins to multiply. When it does begin to multiply, it does so once every 15 minutes. So, in 2 hours at 95°F after lag, you can get very sick from the turkey. It is critically important either to eat all of the turkey or, after 2 hours, cut it into slices thinner than 2 inches and cool less than 2 inches deep in the refrigerator. The turkey must also be cooled to 41°F to assure safety. Freeze any portions that will not be eaten within 24 hours.

10. Using the turkey meat

If you have followed the above steps after the turkey was cooked and served, and it was stored promptly in the refrigerator, reheating is not a critical control point for safety, and you can eat the leftover cold turkey in any way that you wish -- sandwiches, salads, soups, stews, etc. If you have "abused" the turkey, and it sat out for many hours, reheating will not guarantee the safety of your leftover turkey. Throw the turkey out if it sits out longer than 4 hours at room temperature. Never use your nose and smell or taste to verify the safety of the leftover turkey. Ready-to-eat food that makes you sick normally tastes, looks and smells fine.