



Don't Spoil Thanksgiving Dinner: Follow These Storage Guidelines for Fresh Poultry

—Mike Badger

Holding fresh turkey and chicken safely is a year-around concern for producers, but the question is accentuated during the Thanksgiving turkey time. When processing holiday turkeys, producers are trying to overcome several problems, including timely processing, demand for fresh birds, and lack of storage space. The perennial questions are, "How far before Thanksgiving can I process, and how long can my customers store the turkey in the refrigerator?"

At some point in your life, you have pulled a forgotten package of meat out of the refrigerator and wondered if it was safe to eat. The beginning signs of spoilage are a pungent odor, followed by slime, and strong odors. That would definitely ruin the Thanksgiving meal, even more than crazy Uncle Eddie.

The most accurate answer to storage time is that the time a fresh poultry carcass can be stored without spoiling will be affected by time, temperature, and bacteria concentration. To help you make the best decisions possible, I'll provide the general temperature guidelines as researched and published by the scientific community, as well as some of the underlying explanations. It's the underlying explanations that will help further your understanding and help prioritize your cooling and storage efforts.

If you're in a hurry, skip ahead to the Storage Duration section and the Food Safety Temperatures sidebar for actionable starting points.

Reconciling USDA Recommendations

The United States Department of Agriculture's (USDA) recommendation to consumers who buy and store fresh poultry is to use or freeze the product within two days, but that doesn't give us enough information to successfully answer the question about how long fresh poultry can be stored without spoiling.

The two day metric for consumers is misleading, especially given the fact that we know that's only two days from the time the consumer makes a purchase. We still have to account for the handling, transporting, and display times. In addition, each one of us has anecdotal evidence that disproves the two days recommendation. Nevertheless, we ultimately have to give advice to ourselves and our customers in the face of this widely publicized two-day rule.

Storage Duration

Exactly how long you can store a fresh turkey or chicken at 26 degrees before it spoils is an incredibly difficult number to find. And chasing that number is not likely a huge benefit to pastured poultry producers, unless you have a cold storage option that can precisely regulate that temperature or you're planning to process weeks or months ahead of time.

For pastured poultry producers, the choice is often frozen or near refrigerator temperatures. Frozen chicken or turkey will be safe to eat indefinitely, as long as the product remains frozen throughout

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storage. Product quality may degrade over time, but product quality is not synonymous with safe-to-eat.

Using the Tompkin Paper as a guide, poultry has the following shelf life expressed as days to spoil at Fahrenheit temperature:

- 18 days to spoil at 32°F
- 11 days to spoil at 37°F
- 8 days to spoil at 42°F
- 6 days to spoil at 47°F
- 2 days to spoil at 68°F

For producers who do not have a walk-in cooler that can regulate the temperature, there are ways to store your poultry near 32 degrees. Consider that an ice water slurry can achieve a temperature of 32 °F, which is why thermometer directions often recommend using a glass of ice water to calibrate a thermometer. Holding birds in a cooler of ice water can buy a significant amount of time, as shown by Tompkin's numbers. I routinely age my chickens for 24 hours and my turkeys for up to 48 hours in ice before packaging.

Tompkin also provides guidance on the effect of bacteria at various temperatures. At 40 degrees with an initial bacterial load of 100 CFU/cm², Tompkin cites 14 days of storage before spoilage. At 50 degrees, the days to spoilage become six.

Increase the bacterial load to 100,000 CFU/cm² and the time to spoilage decreases to two days at either 40 or 50 degrees. According to Susan Beal, DVM, a CFU is a colony forming unit and generally represents the number of viable organisms in a sample. Bacteria and fungi loads are often expressed as CFUs.

The bacteria that cause food spoilage are known as psychotropic, meaning it can grow in cold conditions, such as a refrigerator. This is different than other bacteria we are often concerned with, such as Salmonella and Campylobacter, which do not grow in cold conditions.

What is Fresh Poultry?

Let's define fresh poultry, as regulated by the USDA Food Safety and Inspection Service (FSIS). In 1997, FSIS determined that fresh poultry has never been stored below 26 degrees Fahrenheit. The rule argues that 26 degrees is the point at which the flesh of the carcass is still pliable to the touch and meets the consumer expectation of a fresh product. At 25 degrees or below, everything freezes solid.

Psychotropic bacteria also differ in that they are generally not present in the intestinal tract. Carcass exposure happens as a result of processing from contact with feathers, feet, equipment, and chill tank water.

Consumer Advice for Storing Turkeys

When I hand out turkeys to customers, I tell them that they should place the turkey on the bottom shelf of the refrigerator. A refrigerator should have a temperature range between 35 and 40 °F, providing enough cooling to hold that turkey until Thanksgiving day. The bottom shelf is the coldest point (cold air settles). Placing poultry on the bottom shelf also prevents juices from dripping onto other items in the refrigerator.

References

[1] Tompkin Paper: https://meathaccp.wisc.edu/Model_Haccp_Plans/assets/raw_ground/TompkinPaper.pdf

[2] FSIS Directive 7110: <http://www.fsis.usda.gov/OPPDE/rdad/FSISDirectives/7110-3Rev1.pdf>

[3] The Poultry Label Says Fresh: <http://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/poultry-preparation/the-poultry-label-says-fresh/>

Significant Food Temperatures

In Directive 7110, FSIS publishes the following list of traditionally cited temperatures as it relates to storing and cooling products, including raw poultry:

- 35 °F—FSIS recommended storage temperature for periods exceeding one week. This storage temperature will greatly reduce the growth of psychotropic spoilage bacteria, as well as psychotropic pathogens such as *Listeria* and *Clostridium botulinum* type B.
- 40 °F—Traditional FSIS recommended maximum storage temperature and control point.
- 45 °F—FDA recommended temperature cooling control point and maximum storage temperature for retail establishments.
- 80 °F—Approximate transition between rapid growth and slower growth of many food-borne pathogenic bacteria; little or no growth of *Clostridium perfringens* below this point.
- 100 °F—Rapid growth of most food poisoning bacteria.

Using the Tompkin paper, we get an idea of what the effects are when the temperature approaches the rapid growth point. At 50 °F, it will take 107 hours to experience a ten-fold increase of *Salmonellae* (from 10 CFU/ml to 100 CFU/ml); at 70 °F, it will take only nine hours to experience the same ten-fold increase.

The Tompkin paper and the FSIS directives provide the basis for common sense temperature control, but it's also a great starting place if you're developing your own HACCP plans for inspected slaughter.