

Dry Meat Safely at Home

Drying is the world's oldest and most common method of food preservation. Canning technology is less than 200 years old, and freezing became practical only during the last century when electricity became widely available to power commercial and home freezers. Food drying technology is both simple and readily available to most of the world's cultures.

The scientific principle of food dehydration is to remove moisture to a point where microbial growth (bacteria, yeast, and mold) and chemical reactions (enzymatic deterioration) cannot change the food during storage. The food shrinks, becomes lightweight, and is easier to store.

Illnesses due to *Salmonella* and *E. coli* O157:H7 from improperly made homemade jerky raise questions about the safety of traditional drying methods for making beef and venison jerky. The USDA Meat and Poultry Hotline recommends heating meat to 160°F and poultry to 165°F to destroy bacteria. A dehydrator may not reach these temperatures, and most dehydrator instructions do not include this step.

Maintain a constant dehydrator temperature of 130°F to 140°F. This speeds the drying process, removing water that allows microorganisms to grow and spoil the food. Do not rush the drying process by raising the temperature during drying. High drying temperatures cause "case hardening" which can trap moisture inside the food and cause spoilage.

Always use safe handling and preparation methods.

- Wash hands thoroughly with soap and water before and after working with meat products.
- Use clean equipment and utensils.
- Keep meat refrigerated at 40°F or slightly below; use or freeze ground beef and poultry within 2 days and whole red meats within 3 to 5 days.
- Defrost frozen meat in the refrigerator, not on the kitchen counter.
- Marinate meat in the refrigerator. Don't save marinade to reuse. Marinades are used to tenderize and flavor the jerky before dehydrating it.

Jerky can be made from almost any lean meat, including beef, pork, venison, or smoked turkey breast. Raw poultry

is not recommended for jerky because of the texture and flavor of the finished product.

When preparing jerky from wild game, remember that the wound location and skill of the hunter can affect the safety of the meat. If the animal is wounded in such a way that the contents of its gut come in contact with the meat or the hunter's hands while dressing the meat, fecal bacteria can contaminate the meat. It is best to avoid making jerky from this meat and use it only in ways that it will be thoroughly cooked. Deer carcasses should be rapidly chilled to avoid bacterial growth.

Heating Methods

Two methods can be used to heat jerky to safe temperatures: heating meat strips in marinade before drying, or heat dried jerky strips in an oven after drying. Both methods are described below. Heating marinated meat before drying may reduce drying time, but color and texture will differ from traditional jerky.

Preparing the Meat

Partially freeze meat to make slicing easier. The thickness of the meat strips affects the safety of the methods recommended in this book. Slice meat no thicker than ¼ inch. Trim and discard all fat from meat to reduce rancidity. If a chewy jerky is desired, slice with the grain. Slice across the grain if a more tender, brittle jerky is preferred. A tenderizer can be used according to package directions, if desired. The meat can be marinated for flavor and tenderness. Marinade recipes may include oil, salt, spices, and acid ingredients such as vinegar, lemon juice, teriyaki sauce, soy sauce, or wine.

Jerky Marinade

- 1½ to 2 pounds of lean meat (beef, pork, or venison)
- ¼ cup soy sauce
- 1 tablespoon Worcestershire sauce
- ¼ teaspoon each of black pepper and garlic powder
- ½ teaspoon onion powder
- 1 teaspoon hickory smoke-flavored salt

Combine all ingredients. Place strips of meat in a shallow pan and cover with marinade. Cover and refrigerate 1 to 2 hours or overnight. Products marinated for several hours may be more salty than desired. If you choose to heat the meat before drying, do so at the end of the marination time. To heat, bring strips and marinade to a boil and boil for 5 minutes before draining and drying. If strips are more than ¼ inch thick, time may need to be increased. If possible, check the temperature of several strips with a metal stem-type thermometer to determine whether meat has reached 160°F.

Drying the Meat

Remove meat strips from the marinade and drain on clean, absorbent towels. Arrange strips on dehydrator trays or cake racks placed on baking sheets for oven drying. Place the slices close together, but not touching or overlapping. Place the racks in a dehydrator or oven preheated to 140°F. Dry until a test piece cracks but does not break when it is bent (10 to 24 hours for samples not heated in marinade). Samples heated in marinade will dry faster. Begin checking samples after 3 hours. Once drying is completed, pat with clean, absorbent towels to remove excess beads of oil and cool. Remove strips from the racks. Cool.

If the strips were not heated in marinade before drying, heat them in an oven afterwards to be safe. Place strips on a baking sheet, close together, but not touching or overlapping. For strips originally cut ¼ inch thick or less, heat 10 minutes in an oven preheated to 275°F. (Thicker strips may take longer to reach 160°F.)

Making Jerky from Ground Meat

Jerky can be made from ground meat using special presses to form or shape the product. Disease-causing microorganisms are more difficult to eliminate in ground meat than in whole meat strips. Again, an internal temperature of 160°F is necessary to eliminate disease-causing bacteria such as *E. coli* O157:H7, if present. After dehydrating ground meat jerky, place on a baking sheet and heat 10 minutes in an oven preheated to 275°F.

Storing Homemade Jerky

Package dried jerky in glass jars or heavy plastic food storage bags. Vacuum packaging is also a good option. Homemade jerky is best used within 1 to 2 months. Refrigerate or freeze homemade jerky for longer storage.

Resources

Judging Home Preserved Foods. 2003. National Center for Home Food Preservation, University of Georgia Cooperative Extension. https://nchfp.uga.edu/publications/nchfp/tech_bull.html#gsc.tab=0

Wild Side of the Menu No. 3, Preservation of Game Meats and Fish. August 2022. North Dakota State University Extension, <https://www.ndsu.edu/agriculture/extension/publications/wild-side-menu-no-3-preservation-game-meats-and-fish>

Jerky and Food Safety. USDA Food Safety and Inspection Service Fact Sheet. September 22, 2023, <https://www.fsis.usda.gov/food-safety/safe-food-handling-and-preparation/meat/jerky>

Drying Jerky. 2014. National Center for Home Food Preservation, University of Georgia Cooperative Extension. <http://nchfp.uga.edu/how/dry/jerky.html>

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