

Beef Jerky Lab

The laboratory procedures illustrate variables in raw material preparation and processing.

Materials

10 pounds lean top round roast

Marinades (ex. teriyaki)

Cutting board

Knife, slicing

Bowl

Steam kettle (or large pot and stove)

Tongs

Paper towels

Dehydrator, set for 165°F or greater

Timer

Water activity meter

Plastic bags

Laboratory Methods

Beef Jerky Variables

Flavors:

Teriyaki/Soy Sauce

Mesquite

Hillbilly

Method of drying:

Dehydrator

Oven

Beef Jerky Manufacture

1. Slice beef roast into strips, approximately ¼" thick, 2" wide and 6" long, place in bowl.
2. Measure water activity of the raw meat and record.
3. Divide marinade spice mixture in half. Set one half aside.
4. Mix marinade spice mixture with water in a pot, according to the directions.
5. Bring marinade to a rolling boil.
6. Drop the strips of meat into the marinade.
7. Once the marinade begins boiling, time for 1 minute.
8. Remove strips from marinade and transfer to cooling rack.
9. Gently blot the strips with a clean paper towel.
10. Measure water activity of cooked meat and record.
11. Dry the strips in an oven (set on lowest level of bake with door propped open) OR in a dehydrator set to 165F.
12. During the dehydration process, remember to:

- i. Rotate the shelves every hour or so to optimize air flow to all meat slices.
- ii. Measure the water activity of the beef jerky every hour, record the time, a_w , and comments on the worksheet; the frequency of measurement may need to be increased as the product approaches the target a_w of < 0.85 .
- iii. Take a final water activity reading and note time when the finished product is removed from the dehydrator or oven.

Note: In the dehydrator, the total process should take ~ 3 to 4 hours; in the oven, the process should take ~8 hours. The finished beef jerky should be pliable but should not break when bent in half

13. When jerky is dried, turn off the dehydrator and let the jerky strips cool to room temperature.
14. Store in plastic bags and label with flavor and dehydration method.
15. Graph the decrease in water activity as a function of time.