

Meat Dehydration

Drying is one of the oldest food preservation techniques used to prolong shelf-life of foods. It minimizes storage and transportation costs and makes handling easier by reducing size, weight, and risk of microbial contamination of foods. Although meat can currently be preserved by freezing, refrigeration, and thermal processing, some traditional meat products (fermented sausages, dry-cured hams, pastrami, jerky, Bresaola (Italy), Biltong (southern Africa), Odka (Somalia), Kuivaliha (Finland), Qwanta (Ethiopia), Kilishi (Nigeria), etc.), in which drying is one of the main processes, are still produced in large quantities due to their unique and popular flavor.

- Removal of water from meat concentrate, the water soluble nutrients making them unavailable to the microorganisms.
- The extent of unavailability of water to microbial cell is expressed as water activity.
- Dehydration lowers the water activity considerably to prevent the growth of spoilage causing microbes.
- Sun drying of meat chunks as a means of preservation was practiced in ancient days but rehydration of such meat chunks used to be limited.
- The mechanical drying process involves the passage of hot air with controlled humidity but here also there is difficulty in rehydration.
- Freeze drying of meat is a satisfactory process of dehydration, preservation due to better reconstitution properties, nutritive quality and acceptability of the meat products.
- Freeze drying involves the removal of water from a food by sublimation from the frozen state to vapor state by keeping it under vacuum and giving a low heat treatment.
- Freeze drying of meat is carried out in three steps, namely pre-freezing, primary drying and secondary drying.
- Meat is first frozen at -40°C , and then it is dried under vacuum for 9-12 hours at low temperature in plate heat exchangers at 1-1.5 mm pressure of Hg.
- Ice crystals get sublimated to water vapors and there is no rise of temperature.
- In the 1st phase of drying, free and immobilized water of meat, which is freezable and constitutes about 90-95% of total moisture, is removed.
- Secondary drying is done at high temperature to remove remaining 4-8% bound water.
- Freeze dried products are packed under vacuum and have very good storage stability.
- The process has been largely used for the preparation of dehydrate meat soup mixtures.