



**Ministry of Agriculture, Livestock, Fisheries and Cooperative**

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**DRYING FRUITS, VEGETABLES AND MEATS DURING COVID 19 PANDEMIC**

**SUN DRYING**

During rainy season, there are plenty of local vegetables such as, cowpeas leaves, pumpkin leaves, stinging nettle (thabai), managu, mitoo, terere, sukuma – wiki and spinach, in the markets and on our farms. Seasonal fruits also flood the market and are in plenty on our farms during peak season. Such fruits and vegetables are rich in vitamins and minerals that are important for boosting body immunity to protect and fight against disease. During festivities or during COVID 19 lockdown, households may have extra meat stock that could easily spoil if not well preserved.

Households can make use of the STAY HOME time to dry vegetables, fruits and meats to ensure constant availability of the nutritious foods even during lean season. Having adequate stock of dried vegetables, fruits and meat will reduce frequency of market visits and this enhances social distancing during COVID 19 pandemic.

Drying fresh vegetables and fruits also reduces bulkiness and weight, eases storage and transportation, avoids wastage and can be a source of income during lean season.

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**PROCEDURE OF DRYING VEGETABLES**

**Requirements**

- Select fresh high quality dark green leafy vegetables (cowpeas leaves, pumpkin leaves, kales, spinach etc.)
- Basins and Sufurias
- Fuel for boiling water
- Clean water for washing, cooling and blanching the vegetables
- Salt
- Strainer (sieve), knife and chopping board

- Solar dryer or clean sack with net to cover

### Procedure

1. **Cleaning:** Thoroughly wash vegetables before chopping
2. **Trimming and chopping,** remove any fibrous or woody portions of vegetables and all decayed and bruised areas. Use a stainless-steel knife and chop the vegetable into equal sizes (thickness) to ensure uniform drying.
3. Prepare only as many vegetables as can be dried at one time. Holding vegetables, even in the refrigerator, after washing and preparing for drying will result in loss of quality and nutrients.
4. **Blanching:** add clean water into a large sufuria up to mid-way point. The water should be enough to immerse the vegetables. Add salt and bring water to a boil. Use 30 grams of salt (3 leveled tablespoons) per 1 liter of water.
5. Add the chopped vegetables to the boiling water.
6. Start timing as soon as you add vegetables into the boiling water. Adjust heat to ensure continuous boiling. Blanch vegetables for 1 to 1 ½ minutes (ensure all vegetables are covered by the boiling water).
7. Quickly drain the vegetables and put them into the cold water to cool them off.
8. Drain and spread the vegetables on a perforated cooling tray/a clean gunia/mat and cover with a net to prevent contamination.
9. Dry indirectly from the sun in a clean safe place (this should be done under a shade avoiding direct sunlight to prevent loss of nutrients).
10. Keep turning the vegetables after every 3 hours.
11. Store the dried vegetables in airtight containers or bags.

**NB:** 1 kg of fresh vegetables yields 100gm of dried vegetables. When preparing the dried vegetables for consumption, soak for about 1 to 2 hours to restore moisture. Ensure that the water used to soak is not discarded but used for cooking to avoid loss of nutrients.

### DRYING MANGO SLICES

1. Wash the mangoes well with water and soap or saline water.
2. Peel and cut into 6 to 8 mm thick slices.
3. Soak slices into water, lemon juice and sugar solution for 15-20 minutes. (50 mls lemon juice: 60 grams sugar :1 litre of water).

4. Drain the slices and place them on stainless steel perforated trays that are coated with a little oil or on a clean gunia. Cover with net and then place them outside on a raised platform under a shade to dry.
5. Keep turning after every 3 hours.
6. The fruit slices should be dry within 1 ½ to 2 days depending on the weather.
7. Dry the slices till half-brittle.
8. The dried slices should be put in airtight containers, labelled and stored in a cool dry place.
9. The product has a shelf life of about 12 months.

### DRYING RIPE BANANAS

1. Wash and peel unblemished uniformly colored bananas with care to avoid damaging them.
2. Cut the bananas in 0.5 cm thick slices.
3. Soak slices into solution of 100 mls lemon juice: 60 grams sugar: 1 liter of water for 10-15 minutes.
4. Drain the slices and place them on perforated trays coated with little oil or clean gunia. Cover with net and then place them outside on a raised platform under shade to dry.
5. Keep turning after every 3 hours.
6. The fruit slices should be dry within 1 ½ to 2 days depending on the weather.
7. When the slices are half-brittle, package them in airtight containers and store in a cool dry place.
8. The product has a shelf life of about 6 months.

### MEAT PRESERVATION

Drying meat under natural temperatures, humidity and circulation of the air, including direct influence of sun rays, is the oldest method of meat preservation. It consists of a gradual dehydration of pieces of meat cut to a specific uniform shape that permits the equal and simultaneous drying of whole batches of meat.

1. Only lean meat is suitable for drying.
2. Preferably meat of a medium-aged animal, in good condition, but not fat.
3. Cut meat into long identical strips. The meat must be spilt along the muscle fibers

4. The length of strips may differ, though it should not be less than 20cm and not more than 70cm. Meat cut into shorter strips requires considerably more time for hooking than the same quantity cut into longer strips. However, strips which are too long may break because of their weight.
5. The thickness of the strips determines the duration of the drying process. Since thick strips take considerably more time to dry than thin ones, it is important that strips to be placed in the same batch are of the same cross-section, with only the length differing.
6. Deep the strips in salt solution for 5 minutes (within 5 hours after slaughter) then drain. Draining should be done by placing the strips into a plastic sieve in order to allow the brine to drop off for collection and re-use. Salt inhibits microbial growth and keeps flies away.
7. Suspend the meat strips individually from one end, thus ensuring free air circulation along the whole length of the pieces and fast and uniform drying. The contact of meat pieces with each other during drying must absolutely be avoided, since these areas will remain wet and humid for a prolonged period, thus making them a favorable environment for spoilage, bacteria and flies. Suspend using (A) metal hooks, (B) loops or (C) metal clips. The meat strips are hooked at one end, always the thicker end for stability, and suspended on a horizontal wooden stick, tightrope or wire. If hooks are not available, suspend as illustrated in figure 1.
8. Hang on meat dryer (poles) made of wood or metal and sundry.
9. Dry for 4 to 5 days, after this period, the meat is ready for consumption, packaging or transportation.
10. Under dry climatic conditions two basic shapes of meat pieces proved to be the most suitable for natural drying:
  - a. strips with a rectangular cross-section of 1 x 1 cm; and
  - b. Flat-or leaf-shaped pieces with cross-sections of max. 0.5 cm x approx. 3, 4 or 5 cm.



Figure 1: Meat strips suspended to dry