



Solar Food Drying

Age group	Construction: 10 years and above. Use: 7 years and above
Duration	3-5 hours to build the dryer. ½ hour to prepare the food. 1-3 sunny days to dry the food
Group size	Construction: up to 6 people. Use: up to 10 people
Location	Construction: indoors or outdoors. Use: outdoors
Possible on rainy days	Construction: yes. Use: no
Keywords	Drying fruits and vegetables, food conservation



Short description

Solar drying is probably the oldest food conservation method. Many centuries ago, our ancestors found out that they can keep a fish or a fruit for a longer period of time if they let it dry in the sun. It is still a useful and widely used method today. Let's try to make our own healthy snacks for the next hike or camping trip by drying fruit in a simple solar food dryer!



Remark

Setting up, charging and supervising a food dryer is an outdoor activity and you will spend some time exposed to the sun. Therefore, implement the current measures like applying sunscreen and wearing sunglasses, hat and long sleeve shirt. Please be cautious when handling sharp knives.



Materials

These are the materials you need:

- Solar dryer (Cardboard model (<https://solafrica.ch/wp-content/uploads/2026/01/Construction-manual-tunnel-solar-food-dryer.pdf>) or tunnel dryer (<https://solafrica.ch/wp-content/uploads/2026/01/Construction-manual-tunnel-solar-food-dryer.pdf>))
- Fruit or vegetables
- Kitchen knife
- Cutting board
- Bowl
- Optional: Food disinfectant
- Optional: Water with lemon juice



Instructions

That's how you use the solar dryer:

1. Set up the dryer: Install your solar dryer in a place where it will get as many sunlight hours as possible, where it isn't exposed to much wind and where animals will not steal the food. (Before its very first use, let it get hot in the sun for several hours to get rid of potential harmful gases from the paint, cardboard or glue.)
2. Prepare the food: Wash the fruit or vegetables well. Optionally disinfect them using a food safe product. Peel them, remove large seeds and cut the fruit or vegetables in slices of

typically 7mm thickness. You might drip the the bits in water with some lemon juice, so they won't turn brown. Work as cleanly as you can, the aim is to have the least germs on the fruit.

3. Dry the fruit or vegetables:
 - Option dryer without a fan: Lay out the fruit on the bamboo sticks. Cover the whole frame with a mosquito net. Direct your dryer facing the sun, re-adjusting it every 3 hours, approximately. Adjust the angle of the mirror in order to reflect as much sunlight as possible on the window of the dryer. According to the fruit, the sunshine, the thickness of the slices, etc., it might take from 1 to 3 days to dry the fruit. Store it overnight in a safe place without ants or humidity, if drying takes more than one day.
 - Option dryer with a fan: Extend the fine mesh on the frame with woven strings. Lay out the fruit on the mesh. Put the frame into the solar dryer. Orient the solar panel towards the sun (it might need to be re-adjusted every few hours) or plug the transformer in to the power outlet. According to the fruit, the sunshine, the thickness of the slices, etc., it might take from 1 to 3 days to dry the fruit. Store it overnight in a save place without ants or humidity, if drying takes more than one day.
4. Store the dried fruit and enjoy it: Store the dried fruit in a hermetically closed container where it is protected from moth (flies), ants and humidity. Enjoy it during your next hike!

Advanced variants :

It's best to start your experiments drying thin slices of fruit. Later on, use your imagination and experiment all types of recipes. You can dry vegetables for your soup, dry mushrooms or prepare sun dried energy bars or even Christmas decorations, as you can learn in the next paragraphs.

Make your own energy bars mixing fruit puree with oat, any mixture of seed and a bit of honey or sugar syrup and make a thick paste. Extend the paste on a food grade silicon mat (sold for baking) in a 5mm thick layer. When it starts getting solid, turn it over and continue drying. Cut it in bars and give your bars a fancy name.

For decorations (for example for Christmas or other special events), you can cut stars out of orange peel and dry them in the solar dryer.



Explanation and further information

Solar drying is as simple as that: the sunlight passes through the transparent cover and heats a black surface. The hot surface passes its heat to the air above it, making the air (relatively) dryer. The dry air passes over the food, takes up the humidity of the food and gets humid itself. We have to provide some airflow to replace the «water charged», humid air by new, sun-dried air. Therefore, the technique works based on a combination of solar heat and airflow.

The airflow can be provided in two different ways: By taking advantage of the fact that hot air rises upwards (like a flame), or by using an electrical fan. In the first case, the dark zone which absorbs the sunlight must be lower than the zone where the fruit is laid out.

Solar drying needs heat, but not too much – we want the food to dry, not to cook! The air's temperature should not go above 45°C.

To make the process easier and faster, prepare the food in a way that the humidity can easily escape: cut fruit or vegetables in slices about 7 millimetres thick and place them on an elevated mesh. That way, the hot air can also pass below the slice and dry it from all sides.

Drying cannot be done in a very fast way, as the food would only end up having a dry skin but a humid core. According to the sunshine, the outside temperature and the humidity of the air around the dryer, it takes from 1 to 3 sunny days to dry fruit or vegetables.

Did you know...?

You might think that solar drying is nowadays only used to make snacks. In fact, this method is still applied at large scale to many products. Most staple food like rice, wheat, corn, beans, coffee,

cacao, etc. needs to be dried for storage. This can be done industrially by using a gas flame, but smaller farms tend to lay out the harvest in the sun on mats or fabric (or even just on the street!) for drying.



Reflective questions

Ask your parents or grandparents if they use or used to dry fruit (or other food) at home.

Do you know if farmers in your region use the sun to dry their harvest? Which crop or fruit do they dry?

Do you think you live in a region of the world which is favourable for drying with the sun? Why? Why not?



Impressions

