



Drying - (dehydration)

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What is dehydration?

Dehydration is a method of food preparation that works by removing water from food thus inhibiting the growth of bacteria, yeasts & moulds.

It generally involves a method of heating at a low temperature with plenty of air circulation.

Dehydration (or drying) is one of the oldest methods of food preservation.

Vegetables, fruit, herbs, meat & fish can all be preserved by dehydration. These cards focus on drying vegetables, fruit & herbs

A brief history

Earliest recordings of drying food date back to 12,000 BC when Egyptians dried fish & meat in the heat of the desert sun. This was not a method suited to the cooler, wetter climate of Europe, where in the Middle Ages, still-houses were built, here fruits, vegetables, herbs, meat & fish were strung across a room and dried by the heat of a fire.

Mechanised production arrived during the 18th century with new methods evolving to the present day freeze drying. This works by freezing the material, then reducing the pressure and adding heat to allow the frozen water in the material to evaporate as water vapour.

To use the technique of drying at home you can simply use low heat, from the sun or electric, together with airflow to dry & preserve your food.

Benefits of drying

- ♥ easily preserves an abundant harvest
- ♥ reduces waste
- ♥ preserves fruit & vegetables at the peak of ripeness
- ♥ minimal loss of nutrients
- ♥ preserves enzymes
- ♥ preserves healing properties of herbs
- ♥ light & portable to travel with
- ♥ uses no energy for storage
- ♥ low risk factor (i.e. food poisoning)
- ♥ easy method both to make and use
- ♥ 100% natural – no preservatives or additives
- ♥ Excellent way of storing emergency food supply

Equipment

- ◆ dehydrator - electric or solar.*

You can improvise with an oven if you can set the temperature low enough (140°F/60°C) but it will use more energy than a commercial dehydrator or a home constructed solar dryer.

Commercial dehydrators give more consistent results, are easy to work with and produce a better quality product. The initial outlay may be a bit daunting but in the long run you will save money.

You could share the cost & use amongst a group of friends.

- ◆ string – for hanging herbs in a dry, airy room.
- ◆ baking parchment or dehydrator tray inserts
- ◆ chopping board & knife for preparation
- ◆ blender if you are making biscuits, crackers or fruit leathers

** see resources*

Key considerations when using a dehydrator

When you buy a dehydrator choose a model with a back fan because this dries more evenly.

Never mix different types of fruit or vegetable on the same dehydrator tray.

Always try to have even slices of the same thickness for drying.

Do not overlap pieces on the dehydrator tray as this blocks airflow.

To prevent fruits turning brown, they can be dipped very quickly in lemon water made from 2 tablespoons juice to 250ml water. Shake well to remove excess moisture.

The time food takes to dry depends both on the food and the drying conditions. Higher sugar content increases drying time, high humidity increases drying time, thinner pieces dry faster than thick pieces. All drying times in the fruit & vegetable guides are approximations.

Fruit ~ preparation & temperature guide

Fruit	Preparation	Temp	Drying
Apple	Wash & core Cut into rings or slices 1/8" thick	145°F for two hours. Reduce to 115°F	6 - 12 hrs
Pears	Wash, quarter & core	145°F for two hours. Reduce to 115°F	18 - 24 hrs
Bananas	Peel & slice 1/4" thick	115°F	8 - 10 hrs
Plums	Wash, cut in half & stone	145°F for two hours. Reduce to 115°F	18 - 24 hrs
Strawberries	Cut in half	145°F for two hours. Reduce to 115°F	8 - 10 hrs
Berries	As they are	145°F for two hours. Reduce to 115°F	10 - 12 hrs
Apricots	Cut in half & stone	145°F for 3 hours. Reduce to 115°F	18 - 24 hrs
Peaches	Stone & cut in quarters	145°F for 3 hours. Reduce to 115°F	18 - 24 hrs

Storage

Short term storage

Dehydrated foods that you are going to use in the short term can be stored, for ease of use, in air tight glass jars.

Some foods you might make in a dehydrator like crisps or fruit leathers are only good to eat in the short term.

Long term storage.

Warm & hot temperatures, moisture, air & light will all cause food to break down. Store food in air tight containers in a cool, dry and dark location.

An ideal temperature is 60°Fahrenheit or 15°Celsius.

Conditioning

Allow your dried food to cool then place in an airtight jar, fasten the lid and shake daily for a week, this will help distribute any remaining moisture that may remain in larger pieces to the dryer smaller pieces. If any condensation appears dehydrate the food for more time otherwise repack the food for long term storage.

Options for long term storage

Store in glass jars like kilner jars or alternatively pack in paper bags and store in a metal container.

Add oxygen absorbers* to your containers to decrease the amount of oxygen and extend shelf life.

Storage

Mylar bags* are a good option these sturdy bags can easily be made airtight. They come in various sizes so can be used for small and large scale storage. They are particularly good for long term storage.

Vacuum sealing* is another alternative, especially for long term storage. It is a method that reduces the amount of oxygen in a package. By creating an airtight package, your food will last much longer, though you will have to buy another piece of equipment.

Labeling

Label your jars, bags or other containers with information about what's in the container and the date the contents were dehydrated. You could also add a date you think it should be used by.

* *see resources*

Drying herbs

The best time to harvest herbs to be dried and stored is on a sunny morning, immediately after the dew has evaporated. Easy leaves to harvest and dry include nettle, lemon balm, mint & lemon verbena. When flower-heads alone are to be dried, gather when they are well out but before they reach maturity. Good flowers to dry include German chamomile, Gallica rose, calendula & elderflower. Dry in a warm well ventilated spot or use a dehydrator.

Nettles

Tie together 6 or 8 stems and hang in an airy, dry place. Leave until completely dry. Pull off the leaves and store in a paper bag or glass jar in a cool dark place.

To dry in a dehydrator, cut the leaves from the stem and lay them on a dehydrator drying tray, trying not to overlap. Dry as close to a temperature of 95°F/35°C that is possible on your dehydrator checking regularly for approximately 8 -10 hours, cool & store.

Chamomile

Spread your chamomile flowers evenly on clean paper. Leave the blossoms to dry in a not too warm, airy place away from direct sunlight, which should take 4/5 days. Store in paper bags or glass jars in a cool dark place.

To dry in a dehydrator, arrange the flower heads on a drying tray. Dry as close to a temperature of 95° F/35°C that is possible on your dehydrator checking regularly for approximately 8 -10 hours, cool & store.

Drying plant roots

Most roots should be harvested in their second year, as they get older, they become more fibrous and woody.

In general roots are dug for drying in the Autumn when the plant has stored nutrients for the winter.

Once you have harvested the roots process them right away.

Roots to harvest & dry include burdock, chicory, horseradish, liquorice, dandelion & beetroot

The basic method is very simple.

Harvest your roots, gently easing them from the soil with a fork.

Rinse the roots under cool water, using a soft brush to clean off all the dirt .

Slice the roots into ¼ inch slices.

Cut the larger slices in half or quarter them so that all the slices are a uniform size.

Tip the pieces onto a dehydrator tray and dry 115°F/60°C until hard and crisp.

Be sure to dry thoroughly to prevent mould.

Cool before packing. Store in air tight container in a cool, dark place.

If you use a mylar bag or vacuum package system the roots will last up to 5 years.

Powders

The dried roots of common plants (see drying plant roots) can be turned into powders which can be used in a variety of ways to support health.

To make a powder take the cooled dehydrated roots and whiz in a coffee/spice grinder or some other high powered processor like a Bullet or Vitamix. It may take a little while to get it to a fine powder as roots are fibrous.

Sieve the powder into a bowl. Any larger pieces left in the sieve can be added to a tea mix.

For immediate use store in an air tight, glass bottle with an oxygen absorber.

For long term storage pack the powder in vacuum sealed bags. Ideally it is best to store the dehydrated root pieces and grind as needed.

Talk to a herbalist before taking any herbal powders.

Power shot

Slowly blend 20g of powder with 50ml of apple juice and drink straight away.

Smoothie

Fortify a smoothie with a spoonful of powder.

Sweetener

Use beetroot powder to naturally sweeten food.

Dried apple slices

Choose organic apples, most varieties work well, especially good are Granny Smith, Braeburn & Autumn Crisp.

Wash the apples, quarter, core and slice.

If you want to keep the apples slices white quickly dip in lemon water and toss onto a clean cloth to remove any excess water.

Warm the dehydrator to 145°F/63°C

Place the apple slices on dehydrator trays. Make sure there is a space around each slice for air to circulate & achieve even drying.

Place the trays of apple slices into the dehydrator. After 2 hours reduce to 115°F/60°C

Continue to dry the apples, total drying time is between 6 – 12 hours.

When the apple slices are dry, turn off the dehydrator and remove the trays. Let the apples cool before packing. Store in air tight glass jars for up to 6 months. If you use a mylar bag or vacuum package system the apples will last up to 5 years. Label & date before storing.

Dried raspberries

Select firm ripe raspberries.

Try to avoid washing the raspberries, if you do they must be thoroughly dried.

Warm the dehydrator to 145°F

Arrange the raspberries in a single layer on your dehydration tray.

Dehydrate for 2 hours then lower the temperature to 115°F/60C for approximately another 10 hours.

When the raspberries are dry, turn off the dehydrator and remove the trays and allow to completely cool. Store in air tight glass jars for up to 6 months. If you use a mylar bag or vacuum package system the raspberries will last up to 5 years. Label & date before storing.

Dried mushrooms

All mushrooms can be dehydrated, the main mushroom foraging time in the UK is the autumn. Make absolutely sure you have correctly identified the mushrooms you gather and that they are edible. Alternatively dry shop bought varieties. Dried mushrooms bring a rich depth to winter dishes.

Using a small brush remove any soil from your mushrooms. Cut into slices between 1/8" & 1/4" thick. Lay the mushrooms on the dehydrator trays in a single layer. Do not overlap. Dry at 115°F/60°C for between 4 – 8 hours. When they are ready they should be fairly brittle not flexible.

If you intend to use them over the coming months store in an airtight jar. For long term storage up to 5 years use a mylar bag or vacuum package system.

Label & date before storing.

Gundruk

Gundruk is a Nepalese salt free way of preserving green leaves.

Gather some fresh leaves spinach, chard, radish and turnip tops are all ideal. Leave to wilt in the sun turning daily for three days.

Lack of sun may call for a little improvisation, on the windowsill or by the oven are possibilities.

Coarsely chop the leaves, pack into a wide neck jar and keep pressing down on the leaves until they become submerged under their own liquid. If there is not enough liquid in the leaves add some water.

Weigh down to keep the leaves submerged & ferment in a warm place for a week.

Drain and either place the leaves in the sun to dry (which is the traditional method) or dry using a dehydrator. Spread the kale onto the trays with plenty of room for air circulation.

Dry at 115°F/60°C until completely dry.

If you intend to use them over the coming months store in an airtight jar. For long term storage up to 5 years use a mylar bag or vacuum package system. Label & date before storing.

Gundruk relish

60 g gundruk (*see card 17*)

1 red onion finely chopped

1 chilli finely chopped

$\frac{1}{4}$ teaspoon freshly ground black pepper

scant teaspoon salt

1 tablespoon olive oil

1 teaspoon seed mustard

Mix all the ingredients together and serve as a condiment with rice and vegetables

Herb-tea

Nettle tea

Diuretic and general tonic

serves 2

2 tablespoons dried nettle leaves

½ litre boiling water

Using a jug or a teapot, steep the nettles in the water for 5 minutes.

Strain the nettle tea into mugs or glasses.

If you wish serve with a slice of lemon.

Chamomile tea

Good for digestion and aids sleep.

serves 2

3 tablespoons dried chamomile flowers

½ litre boiling water

Put the chamomile flowers into a jug or teapot and pour over the water

Allow to steep for 5 minutes

Strain into mugs or glasses.

Dandelion coffee

Dandelion root supports the liver & gall bladder and also digestion.

Heat the oven to 200°/390F

Arrange dried dandelion root pieces on an oven tray.

Roast the dandelion root in the oven until brown about 30 minutes.

Cool & store in an airtight container.

To make the dandelion coffee

Simmer 2 to 3 tablespoons of roast dandelion root (depending on your flavour preference) in ½ litre of water for 15 minute, strain and it's ready to drink!

Buckwheat crackers

basic mix

250g raw buckwheat groats sprouted for 1 day

75g ground linseed

1 finely grated carrot

1 tsp salt

½ teaspoon black pepper

3 tablespoons olive oil

2 cloves garlic - crushed

additions

1 heaped teaspoon grated fresh turmeric

1 heaped teaspoon activated charcoal powder

1 level teaspoon spirulina powder

Process the buckwheat and carrot in a food processor until well mixed. Place this mixture in a bowl and stir in the remaining basic ingredients.

Divide this mixture between 3 bowls and add a separate flavour addition to each one.

Spread the individual mixtures onto baking parchment or ~~the~~ teflex sheets (these generally come with your dehydrator) to a thickness of approx 3-4 mm. Dehydrate at 140°F (60°C) for about 2 hours. then score into squares of a size that takes your fancy. Dehydrate for a further 2 hours before flipping over (remove parchment or teflex sheet) and dehydrating until completely dry.

When they are dry & crisp, remove, cool and store in an airtight jar.

Kale crisps

200g curly kale

1 tablespoon olive oil

½ teaspoon salt

1 ½ teaspoons nutritional yeast

½ teaspoon chilli powder

Wash the kale if necessary and dry with a salad spinner or towel.

Strip the kale leaf from the stem and tear into large crisp size pieces and place in a bowl. The kale will shrink as it dries so don't tear them too small.

Massage the oil & salt well into the kale for a minute, add the nutritional yeast flakes and chilli and mix well.

Spread the kale onto drying trays with plenty of room for air circulation.

Dry at 115°F /60 °C for 1 – 3 hours.

Store in an airtight jar and use within a month.

Courgette crisps

250g young courgettes

¼ teaspoon freshly ground black pepper

¼ teaspoon salt

¼ teaspoon smoked paprika

½ teaspoon olive oil

1 tablespoon yeast flakes

Slice the courgettes very thin (use a mandolin if you have one) and place in a bowl.

Add the remaining ingredients and toss well together.

Arrange the slices on a dehydrator tray making sure they do not overlap.

Dehydrate at 135° for 7 – 10 hours or until crisp.

Best eaten straight away.

Fruit leather

Some of the best fruits to choose from are: blackcurrants, apricots, raspberries, strawberries, peaches, nectarines and pears.

Wash & prepare your chosen fruit by removing stems and stones.

Blend in a blender until smooth, for every 500ml of puree add the juice of ½ lemon.

You could add a spice or herb; blackcurrants are good with mint, raspberries with thyme and apricots with cinnamon, you could also sweeten with a touch of honey.

Line dehydrator trays with parchment paper or teflex sheets & spread the mixture over the paper 1/8" - 1/4" thick.

Dehydrate at 145°F/65°C for 6 -10 hours.

The fruit leathers are done when they look like leather and are not at all sticky to touch. Make sure you test the middle of the leathers which will be the last part to dry.

Cut the leathers into strips, lay on strips of baking parchment and roll each one up.

Store in an airtight container in cool, dry place for up to 4 – 6 weeks.

They would store in the freezer for up to a year.

Glossary

air drying ~ *open air drying in warm spot with good air circulation*

dehydrator ~ *an electric or solar powered device that removes moisture from food*

digestive enzymes ~ *these enzymes help break down the food we eat.*

enzymes ~ *enzymes are catalysts that speed up reactions in the body*

food dehydration ~ *a technique used to remove water to preserve food*

fruit leathers ~ *a dried fruit puree.*

mylar bags ~ *mylar bags are made from a polyester resin laminated to a aluminium foil and extend the shelf life of preserved food*

oxygen absorbers ~ *oxygen absorbers remove oxygen from an airtight container to support long term storage.*

sun drying ~ *sun drying works well, especially for fruits, if the temperature is above 85°F and the humidity below 60%*

Teflex sheets ~ *re-usable, flexible non stick sheets for use on dehydrator trays*
vacuum packing ~ *a method of storing that removes air from a package before sealing.*

vacuum sealer ~ *a machine that sucks the air out of a package and seals it tight.*

vine drying ~ *allowing beans to dry in their pods on the vine until the beans rattle in side*

Resources

Dehydrators are a worthwhile investment. They come in various sizes along with various prices.

Stockli dehydrator with stainless steel trays

Round stackable layers made from stainless steel mesh. Reasonably compact and easy to use. www.ukjuicers.com/stockli-dehydrator-stainless-steel-trays

Excalibur four tray dehydrator

This has a drawer function rather than a stack. Very easy to use, sliding the shelves in and out makes it easy to check on drying progress. You can also buy an Excalibur with 4, 5 or 9 drawers. It's worth buying one with a timer www.ukjuicers.com/excalibur

Solar dehydrator

There are 2 basic designs for solar food dryers. Direct dryers, which are a box with glass, or indirect (which is the better) and uses hot air. You can find instructions to make your own here.

www.motherearthnews.com/diy/build-a-food-dehydrator-zmaz93fmztak/

Mylar bags & oxygen absorbers

www.fresherpack.co.uk

Books

Solar Food Dryer – How to make & use your own low-cost, high-performance sun powered food dehydrator. Eben Foder
New Society Publishers

The Ultimate Dehydrator Cookbook – The complete guide to drying food –
Tammy Gangloff Steven Gangloff
Stackpole Books

The Food Dehydration Bible – Grow it. Dry it. Enjoy it. - Brett L Markham
Skyhouse Publishing

Greencuisine Trust

Through inspiring projects, courses and consultancy Greencuisine Trust encourages ways of growing and eating that nourish people without harming the environment.

Every day we make decisions about the food we eat, these choices shape our world, they influence our individual health as well as all that inhabit planet Earth.

The Trust is part of a global food movement driving change in our food systems. We believe that through the widespread sharing of both indigenous & scientific knowledge we could maintain the integrity of the planet and all eat nutritious food.

Greencuisine Trust – charity no 1141277
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Acknowledgements
Text & design ~ Daphne Lambert
Layout ~ Jean Taylor
Linocut ~ hugh@dunfordwood.com