

The Dos and Don'ts of fermenting

Follow these simple rules to always ferment safely.

Please see the recipe section for fermentation recipes – these are extra notes to help you.

First of all it is worth noting that there are no recorded cases of food poisoning from home fermentation in the 15 years of US records I looked at (there just isn't the data in the UK as we are relatively new to this). And after all, people have been fermenting for centuries, before anyone even knew about germs. You can ferment in an old sock if you like and even then it is extremely unlikely that illness could arise from fermenting, but I thought it might be useful to make a definitive list of things NOT to do when you are starting out, to negate even the most unlikely risks that I could think of.

1. Don't ferment fruit and vegetables that are old fridge fodder. Old fridge fodder might well be covered with various moulds/ stray bacteria from your fridge that will mean that your ferment could be more at risk of growing something it shouldn't. Use new, fresh vegetables that are likely to be covered with beneficial bacteria and wash them first at any rate.
2. Don't use fruit and vegetables that are damaged or bruised. When fruit and veg are damaged, pathogenic bacteria can find their way inside the fruit via fruit flies, birds and maggots, including strains of *E. coli*. Although both pH and competition with other bacteria can help destroy these, it's best not to take any risks.
3. Don't use windfalls to make ferments, especially fruit ferments where no salt is added. These fruits are often bruised, and as above could potentially contain pathogenic bacteria from wild-life passing through. To make the most of windfalls, make them into a compote.
4. Don't cover your ferments with a layer of oil (coconut, olive, vegetable etc..) to make an anaerobic environment. The pH of oil is not low enough to prevent the growth of pathogens including *Clostridium botulinum* that could become suspended in the oil on particles of food. Instead use a weight to keep your vegetables submerged under the water, and an airlock system can help too.
5. Do not use tightly sealed (by which I mean regular) jars without gaskets, or mason jars or jars with very tight metal lids for your fermentations without venting. They could explode, due to the gases produced by the microbes while they consume the sugar. They probably won't but better safe than sorry. Generally kilner jars with gaskets are made of sterner stuff, though if your ferments are producing lots of gas pockets you should vent them. To vent

a normal jar turn the lid until you hear a hiss. To vent a kilner jar, cover with a tea-towel and open the catch while pressing down on the lid especially with kimchi which can be rather explosive. Try not to open the jar more than a few mm, you will let air in, which could allow mould to grow, or even worse actually, could oxidise the contents of the jar (the top bit goes brown). Replace the catch with a rubber band if you like.

One way of avoiding this problem with normal jars is to forget the lid altogether. Instead of the lid, part- fill a zip lock bag with 2% brine (so that if the bag bursts it doesn't dilute the concentration of salt in the ferment which could affect safe fermentation), and place carefully on the top of your ferment, ensuring complete contact with the top of your vegetables.. This will keep air out of the ferment and stop contamination from occurring but will also safely allow expansion

Salt Tables.

I have given weights as different types of salt vary greatly by how much you can get in a tablespoon... Sea salt without anticaking agents is always best.

Required Concentration	Weight of Vegetables (g) or volume of brine (ml)	Salt required
5% salt	200g	10g
	500g	25g
	800g	40g
	1000g	50g
2% salt	200g	4g
	500g	10g
	800g	16g
	1000g	20g

Fermenting whole vegetables.

You can ferment all sorts of vegetables, from carrots to celeriac to red peppers to aubergines to courgettes. If a vegetable tastes unpleasant before you ferment it, it won't taste any better afterwards (I learned this with some nasty bitter courgettes). As a rule, don't ferment things thicker than a medium carrot without cutting into smaller pieces, so that the brine can penetrate.

To ferment whole vegetables, as opposed to slices that have been squeezed to to extract some juice, you will need to wash and peel them.

Put your jar on the scales and zero it.

Add the vegetables.

Add the water to shoulder height.

Note the weight (of water + vegetables).

Calculate 2% salt concentration.

Add to the jar and stir as best you can to dissolve.

Use a vegetable "gate" to keep the rest of the vegetables under the brine.

These are usually ready within 5-7 days at room temp then put in the fridge.

The brine will go cloudy and the colours fade. This is normal.

About Wild Fermentation

- Vegetable fermentation happens when bacteria (mostly lactic acid bacteria) use carbohydrates (sugars) for energy and in the process produce lactic acid (and some other things too including acetic acid, alcohol and CO₂). Lactic acid lowers the pH of the vegetables, to the point where other bacteria can't survive, thus preserving the food from further deterioration. Lactic acid is basically a naturally produced vinegar.
- Salt is added to the ferment to prevent the growth of unwanted bacteria, yeasts and fungi, especially in the early stages. Lactobacilli are salt tolerant and are able to get going quickly and triumph over these other microbes.
- Fermentation is an anaerobic process – that means it happens in the absence of oxygen. That's why you need to keep as much air out of the jar as possible. If you allow too much air in the jar, yeasts and moulds could start to grow.
- Some veggies don't produce their own brine easily when salted, or perhaps you want them to be in bigger pieces. In this case, you can cut them into slices and cover them with a brine solution (salt dissolved in water).
- How long ferments take has only been really well studied with Sauerkraut and Kimchi. Everything else is a bit hit and miss, and varies according to size of vegetable pieces, age of vegetable..... Generally, watch for signs of fermentation (bubbling usually within 3 days). Most ferments take at least 5 days. They are ready when they taste vinegary and the texture is right. When testing vegetables, open the jar quickly and as little as possible, use a clean spoon and don't double dip.
- Imagination is not one of my attributes. You can add all sorts of herbs and spices to your ferments, the sky's the limit!