

Slide 1

Key Points For Fermenting Foods



Slide 2

Fermenting

- There are a few key points that you always want to remember
- This is the information you want to make sure to communicate to your client or attendees
- Fermentation works in a very straight forward manner
- It may seem like magic but it is really very scientific.



Slide 3

How Fermenting Works

- Fermented foods are a process of slowing or preventing the development of bad bacteria while encouraging the growth of good bacteria and in some foods, beneficial yeast strains
- Fermented foods prevent bad bacteria from growing because of salt, starters, lack of oxygen and the production of acids.
- There are three ways to ferment
 1. With a starter
 2. With salt
 3. With a scoby (symbiotic culture of bacteria and yeast)

Slide 4

Preserving With Salt



- Salt creates growing conditions that favor gram-positive (good) bacteria instead of gram-negative bacteria (bad)
- Salt can eventually become poisonous to the microbes by creating an electrolyte imbalance within the cell.
- A brine (salt and water) that contains of 3.5% salt will normally prevent serious pathogens such as Clostridium or botulinum from growing. Brines that contain 10% salt will normally prevent all pathogenic bacteria from growing.

Slide 5

Preserving With Salt



- When using a brine, yeasts and mold can also grow on the surface if the container is left open to air and oxygen
- To prevent this, fermenting with salt or a brine must occur in an anaerobic circumstance
- Beet kvass, cultured vegetables, sauerkraut and kimchi are made with this process
- This is done by sealing the container with lid, tightly
- The key is to keep the food (cabbage, carrots etc) submerged in the brine during the early days of fermenting

Slide 6

Fermenting With Salt



- There is a tendency for vegetables to float
- In sauerkraut – a weight is used to keep the cabbage submerged
- For beet kvass, kimchi and cultured vegetables, turning the jar inside down daily for the first few days makes sure the brine covers the vegetables to inhibit mold and yeast until other good bacteria strains can build up in the jar
- Leuconostoc mesenteroides is first bacteria to grow and it produces carbon dioxide inside the jar within the first few days causing a vacuum inside

Slide 7

Fermenting with Salt



- When placing vegetables in a brine in a jar, **it is essential to leave at least an inch of space in the jar.**
- This means that when you place the lid on the jar, oxygen is inside of the jar
- Once the *L. mesenteroides* produces the CO₂, the vacuum prevents the growth of yeast and mold from occurring. Nothing grows in a vacuum and the oxygen is gone
- Meanwhile the vegetables and the good bacteria continue to ferment nicely in the anaerobic environment of the brine
- **Fermentation must be done for at least 10-14 days** for enough good bacteria to be present to permanently preserve and to be sufficiently beneficial – can be fermented longer

Slide 8

Salt

- Do not use iodized salt as iodine can inhibit good bacteria
- Himalayan salt and sea salt are good and most pickling salts (read label to make sure they do not contain anti-caking ingredients).
- Kosher salt can also be used but make sure it does not have anticaking ingredients.
- Salt discourages the growth of bacteria except lactobacilli
- How much salt can vary – too much and it is not tasty
- Too little and mold can form on the surface



Slide 9

Salt

- Salt also helps keeps vegetable crunchy
- Salt draws liquid out of the vegetables and help the anaerobic process
- Salt in itself eventually becomes poisonous to the microbes by creating an electrolyte imbalance within the cell
- Fermented foods in brine do taste quite salty
- Combining salt with a starter allows for much less salt use



Slide 10

Using a Starter

- A starter can be anything that already contain strains of good bacteria
- This could be whey (strained from yogurt or kefir), wine, sauerkraut juice, kimchi juice, juice from cultured vegetables, apple cider vinegar – water is added to cover the vegetables (2tbsp. starter to 1 cup water unless it is vinegar - use only 1 tbsp)
- By adding the good bacteria starter, the bad bacteria is inhibited from growing
- The same process occurs as it does with a salt brine
- An inch of space must be left at top. Oxygen will be trapped inside. L. mesenteroides will produce a vacuum inside and prevent any yeast and mold from forming on the surface and the vegetables will continue to ferment in the anaerobic atmosphere of the water and starter.
- Be sure to turn these upside down to cover the vegetables that float for the first few days



Slide 11

Using A Scoby

- Kombucha, milk kefir and water kefir all use a scoby which is a symbiotic starter culture of good bacteria strains and yeast strains
- Only the kombucha starter is typically called a “scoby”
- These fermented products do not require a container with a lid
- I make may milk kefir and water kefir in a jar with a lid – I just find it ferments better
- Both water and milk kefir are anaerobic processes as the grains are submerged in the milk or water
- But they do not need to be in air tight with a vacuum
- Do not use cheesecloth to cover the jar – fruit flies can work way through it – use a tight mesh cloth



Slide 12

Scoby

- Milk kefir and water kefir only take 48 hours and because the scoby contains the good bacteria, the fermentation occurs in a similar manner as the using any starter
- Kombucha ferments at least 10-14 days similar to fermenting vegetables – and it does use oxygen as part of the process
- Normally a jar with a tight mesh cloth is used for kombucha
- Again the scoby, because it contains good bacteria performs just like any starter and prevents the bad bacteria from growing



Slide 13

Sourdough and Grain Fermentation

- Is an aerobic process - the grain ferments by attracting wild yeast strains and beneficial bacteria from the air
- The grain is mixed with water as part of the process as water is needed to promote the growth of the organisms
- Covering a jar with a tight mesh cloth or paper coffee filter is usually best
- Once the yeast strains are sufficient
 - the starter can be maintained by continuing to feed it more flour and water
 - this prevents mold from forming



Slide 14

Sourdough

- If the starter is being stored outside the refrigerator – feed it every other day unless using it to make a specific product (follow the instructions of the recipe)
- If storing it in the refrigerator, feed once a week (put a proper lid on it to prevent it from drying out on top)
- Typically some sourdough starter is remove before a feeding



Slide 15

Safety

- This may seem like common sense
- Clear jars, lids and utensils – they do not have to be sanitized but they do need to be washed with soap and water
- Mason jars work well
- All equipment should be dry and be sure to dry with a clean cloth especially if using a tea towel – otherwise use paper towel
- Only use non-chlorinated water such as spring water and filtered water
 - do not use reverse osmosis or distilled



Slide 16

Safety



- Don't use metal bowl or utensils
- Always use glass bowls and jars
- Rubber, wooden and plastic utensils can be used
- Plastic bowls and containers can be used except be careful
- Plastic can develop cracks and crevices so these must be sanitize in boiling water to be safe or an extremely hot dishwasher
- Strainer or sieves for straining out vegetables or kefir grains or a scoby need to be nylon or plastic – no metal which can interfere with bacteria strains

Slide 17

Safety



- Metal spoons or whisks can be use to mix before any bacteria has been developed
- Once the bacteria is present – do not let the fermented food come in contact with metal unless you are cooking the fermented food in which case it does not matter
- Once the fermented vegetables reaches the desired taste and texture, put it in the refrigerator to slow the fermentation process down and maintain the texture – technically they can continue to be at room temperature and nothing will happen to them although eventually the vegetables will be soft

Slide 18

Safety

- If making more than one type of fermented food, do not store them close to each
- Make sure they are a few feet apart or they can cross contaminate each other with their bacteria strains.
- If something does not smell right – throw it out (should not smell yeasty, moldy or funky)
- Fermented foods typically smell like vinegar or olives
- If any white foam appears on the surface - throw it out
- Sometime a white film appears in the for couple of days as the CO2 is building up – if it disappears it is okay.

Slide 19

Storing A Scoby

- Kefir grain and kombucha scoby should not be left at room temperature once ready – the scobies all require food products and if left to long to ferment they can starve
- To store milk kefir grains – put in a small jar with some milk and keep in the refrigerator – keeps for several weeks
- For water kefir grain – place in a small jar with sugar water and it keeps for several week
- For longer, freeze
- For kombucha scoby – store in the refrigerator in a container with a lid mixed with at least 2 cups of kombucha (depends on the size of the starter) – will keep for several months



Slide 20

Final Tips

- It is very important that you have made several batches successfully to make sure you understand how it works.
- We all have our disasters – that is part of the learning process.
- Start by mastering one type of fermented food at a time so you build your confidence
- Build your knowledge base and you will find it easier to teach others
- Enjoy the process of this amazing food preparation technique

