



sauerkraut & kimchi

LESSON WORKBOOK

EVERYTHING YOU NEED TO KNOW TO MAKE THE HEALTHIEST
SAUERKRAUT AND KIMCHI AT HOME

THE FERMENTED FOODS SEMESTER

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ingredients

CHOOSING INGREDIENTS FOR SAUERKRAUT AND KIMCHI FERMENTATION



THE COMPOSITION OF

fermented *cabbage* recipes

This composition is the logic behind what makes a balanced fermented cabbage recipe. It's a simple way to understand the composition of all my fermented cabbage recipes.

The 65, 15, 20 % breakdown is approximate and for ingredients that contribute to water activity (see lesson 1, topic 5).

YOU CAN APPLY THIS RECIPE COMPOSITION LOGIC USING THE INFORMATION ON THE NEXT 3 PAGES.

65%
CABBAGE

65% of the total makeup of any sauerkraut or kimchi should be cabbage for best results.

15%
WATER

15% of the total makeup of any sauerkraut or kimchi can be added water.

20 %
VEG/FRUIT ADD IN

20% of the makeup of any sauerkraut/kimchi can be other water-containing vegetables & fruits (or more cabbage).

2.5%
SALT ADDED

2.5 % **added** in salt.

APPLYING THE COMPOSITION OF *fermented cabbage recipes*

If you know the total weight of sauerkraut you want to make, you can apply the percentages from page 5 to create a recipe.

EXAMPLE :

You want to make 2 kilograms of celery and apple sauerkraut for your Thanksgiving dinner party next month

So, we know we want our total weight produced to be 2,000 grams

So total recipe weight is 2,000 grams.
Using 2,000 grams, lets apply our recipe composition percentages:

65% CABBAGE: $2,000 \times 65\% = 1,300$ GRAMS OF CABBAGE

15% WATER: $2,000 \times 15\% = 300$ GRAMS OF WATER

20% OTHER FRUIT AND VEG: $2,000 \times 20\% = 400$ GRAMS CELERY + APPLE

Check your work:

$1300 \text{ g cabbage} + 300 \text{ g water} + 400 \text{ g celery/apple} = 2,000$

Last, multiply 2,000 by 2.5% to get 50 grams of salt

APPLYING THE COMPOSITION OF *fermented cabbage recipes*

You can also apply the percentages from page 5 to craft your own recipe using the weight of cabbage you have available.

EXAMPLE :

You just harvested a large head of cabbage from your garden.

The cabbage weighs 1750 grams and you want to make a carrot sauerkraut with all the cabbage.

We know cabbage makes up about 65% of the weight in an ideal recipe. So we can divided the weight of the cabbage by 65% to find the total recipe weight.

$$1750 \text{ grams cabbage} \div 65\% = \approx 2,692 \text{ grams}$$

So total recipe weight = 2,692 grams.

Using 2,692 grams, lets apply our other recipe composition percentages:

$$\underline{15\% \text{ WATER:}} \quad 2,692 \times 15\% = 404 \text{ GRAMS OF WATER}$$

$$\underline{20\% \text{ OTHER FRUIT AND VEG:}} \quad 2,692 \times 20\% = 538 \text{ GRAMS OF CARROTS}$$

$$\underline{\text{Check your work:}} \quad 1750 \text{ g cabbage} + 404 \text{ g water} + 538 \text{ g carrots} \\ = \approx 2,692$$

Last, multiply 2,692 by 2.5% to get 67 grams of salt

DETERMINING HOW MUCH FITS *in any jar or vessel*



- If you would like to pick a certain size jar and precisely fill it, you can find **the total mass capacity** that fits your jar and go from there.
- **Here is how you determine your specific jar or crock Total Mass Capacity (Mtotal):**
 - Place your fermentation weight in your empty jar. Set the jar on your scale and tare the scale. The scale should read 0.0.
 - Fill your jar with plain water up to the "shoulder" (the point you consider perfectly filled).
 - Record the water weight. This is your Total Mass Capacity (**Mtotal**) in grams.
 - This (**Mtotal**) is the target total recipe weight to fit perfectly in your jar/crock.
 - You can multiply (**Mtotal**) by our recipe composition percentages on *pg. 5* (65% cabbage, 20% other veg, 15% water) to get your exact starting weights for each ingredient.

the best sea salt

Any sea salt works great for fermentation.

Please ensure the salt you buy does not have anti-caking agents.

Here are some of my favorite salts, all from SaltWorks. They use their Optically Clean Technology that ensures their salts are all unrefined yet free of contaminants and microplastics.

Pure Ocean

A plain Australian, unrefined sea salt. The salt is solar evaporated and purified using SaltWorks Optically Clean technology.

[CLICK HERE](#)

Pacific Blue

Premium, kosher flake sea salt harvested off the coast of South Korea. This is my favorite “plain” salt. It works well with all fermentation.

[CLICK HERE](#)

Himalayan Pink

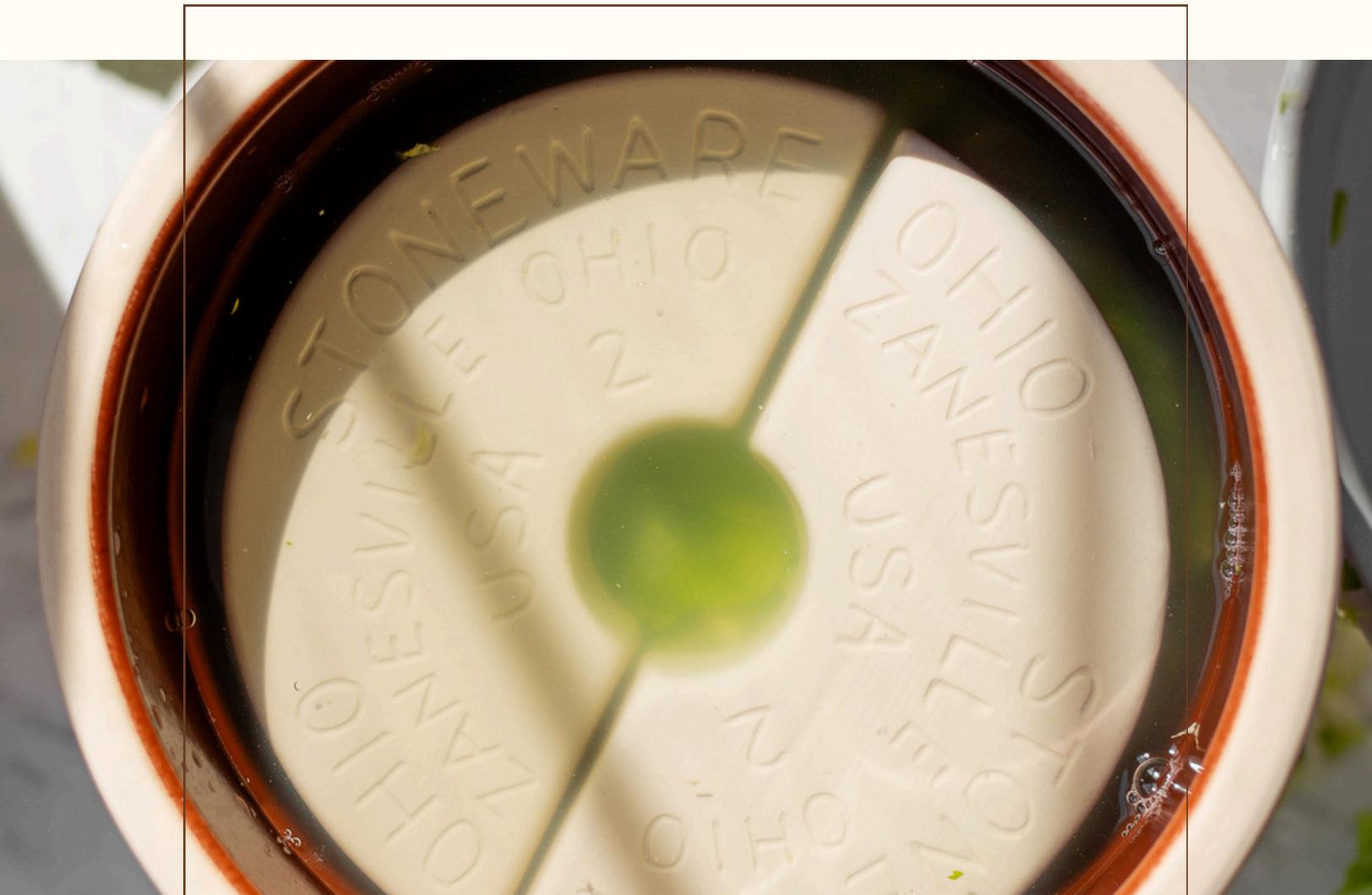
Ancient Ocean Himalayan pink salt from SaltWorks is ethically sourced from ancient seabed deposits. It contains trace minerals.

[CLICK HERE](#)

Sel Gris

Hand harvested salt from France. Also known as French grey sea salt. It contains trace minerals from the clay-lined salt ponds in the Guérande region.

[CLICK HERE](#)



LESSON TWO TOPIC TWO

equipment

FOR SAUERKRAUT AND KIMCHI FERMENTATION

vessels



1-gallon glass jar

Perfect for large batches, no special lid necessary. You'll need a large fermentation weight.

[Amazon](#)



glass weck jars

My favorite jar to use lately. The glass lid is rust-proof and super easy to keep clean.

[Etsy](#)



1-quart mason jar

Most fermentation weights are designed for this type of jar. Wide-mouth jars are best.

[Cultures for Health](#)



lead-free ceramic crock

I've linked a good crock option from Etsy to support a small business!

[Etsy](#)

weights & more



dual kitchen scale

This kitchen scale is perfect for weighing large and small amounts.

[Amazon](#)



rust-proof lids

These are my favorite mason jar lids to use for fermentation. They're durable and easy to clean.

[Amazon](#)



wide mouth weight

Their design has changed over the years, but I've had these weights for over 7 years.

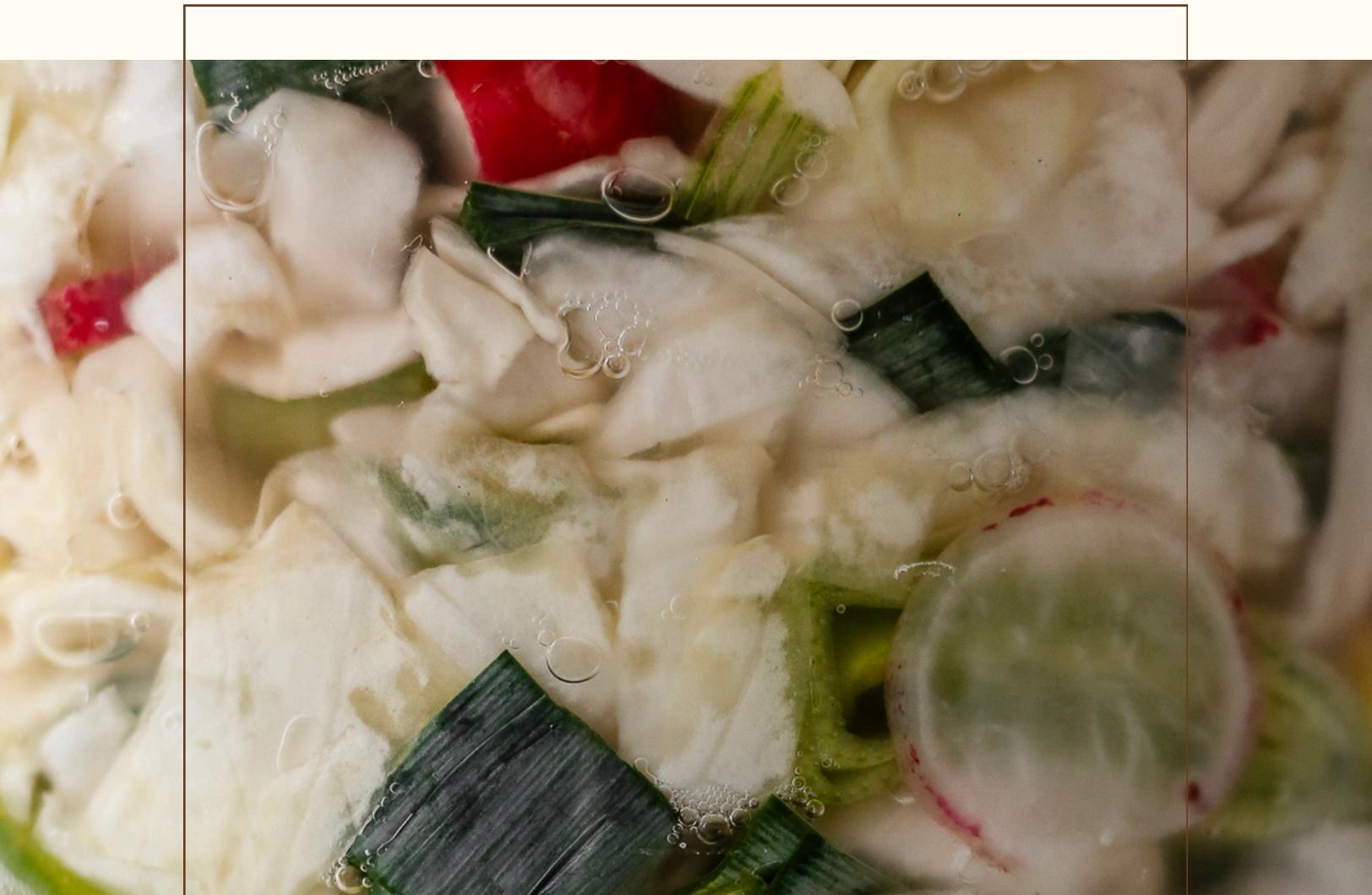
[Cultures for Health](#)



large glass weight

A perfect, heavy option for large batches in glass jars or crocks. Just measure to ensure it fits your jar.

[Amazon](#)



LESSON TWO TOPIC THREE

timeline

FOR SAUERKRAUT AND KIMCHI FERMENTATION

the cabbage fermentation timeline

Oxygen-utilizing microbes deplete all of the oxygen in the brine and then die off.

Leuconostoc bacteria produce carbon dioxide (bubbles), acetic acid, and lactic acid, then die off.

Lactobacillus thrive and produce lots of lactic acid. This acid preserves the food, and the *Lactobacilli* continue to thrive.

VERY LITTLE CHANGE
oxygen is used up

1-3 days

LOTS OF BUBBLES
Leuconostoc bacteria produce
carbon dioxide + acid

4-14 days

LET IT GO
Give the *Lactobacillus* time to
produce beneficial compounds and
great flavor

21-28 days

2-4 days
BUBBLES BEGIN
keep the lid clean and keep
everything submerged

10-21 days
LOTS OF ACID
Lactobacillus begin to thrive;
bubbles decrease then stop

visual cues

The most important things to note:

- Bubbles
- cloudiness is expected and desired
- the cloudiness will settle as sediment



how *smells* develop

It's super easy to monitor smells. Check the smell every time you:

- burp the jar
- check to make sure everything is submerged
- ensure the lid is clean



taste testing

I suggest taste testing at four points to explore and learn how the flavors develop.

- mixed ingredients, fresh (saltiness)
- one day after bubbling begins (not the best, but fun to learn)
- when the bubbles stop
- 28 days





LESSON TWO TOPICS FOUR & FIVE

recipes

MASTER RECIPES FOR 1-QUART AND
LARGE BATCH FERMENTED CABBAGE

sauerkraut in a jar

RECIPE SIZED FOR 32-OUNCE
MASON OR WECK JAR

Ingredients

- 550 grams green cabbage
- 20 grams unrefined sea salt
- 200 grams filtered water



SAUERKRAUT IN A 32-OUNCE JAR INSTRUCTIONS

- 1 Wash your fermentation equipment (jar, weight and lid)
- 2 Remove the outer leaves of your cabbage and lightly rinse with cool water. Using a knife, chop the cabbage to your desired thickness.
- 3 Place your kitchen scale on the counter. Turn it on and set it to weigh in grams.
- 4 Place a mixing bowl on your kitchen scale and tare/zero the scale.*
- 5 Add the designated amount of chopped cabbage into the bowl
- 6 Remove the bowl of cabbage from the scale and set it aside. Place a small, empty bowl on your scale and tare/zero the scale. Weigh out the salt.
- 7 Add the salt into the bowl with the cabbage, and mix with your hands until the cabbage becomes wet.*
- 8 Place your empty, clean mason jar on the scale, and tare/zero the scale. Make sure your scale is still set to grams, and measure out the filtered water
- 9 Add the water into the bowl with the cabbage and salt. Add the caraway seeds. Mix everything well.
- 10 Starting with the liquid, add the entire contents of the bowl into your mason jar, and pack everything down using a tamper, wooden spoon, or your hand.
- 11 Place your glass fermentation weight in the jar, making sure to submerge the cabbage pieces and weight fully into the liquid. If you don't have quite enough liquid, place your glass fermentation weight in the jar and submerge as much as possible. Over the next 12 hours, the cabbage should release more liquid and you can press down your fermentation weight below the brine.
- 12 Secure the solid lid to the jar. ***You do not need to tighten it all the way. Just secure the lid but leave it ever so slightly loose, so the gas doesn't build up too much.***
- 13 Ferment for 21-28 days, then remove the weight and refrigerate. Don't forget to burp the jar daily during the bubbly phase, making sure everything stays submerged.

kimchi in a jar

RECIPE SIZED FOR 32-OUNCE
MASON OR WECK JAR

Ingredients

- 500 grams green cabbage
- 20 grams unrefined sea salt
- 200 grams filtered water
- 15 grams kimchi spice blend*
- 75 grams carrots, julienned
- 30 grams green onions, chopped



KIMCHI IN A 32-OUNCE JAR INSTRUCTIONS

- 1 Wash your fermentation equipment (jar, weight, and lid)
- 2 Remove the outer leaves of your cabbage and lightly rinse with cool water. Using a knife, chop the cabbage to your desired thickness. Chop the carrots and onions.
- 3 Place your kitchen scale on the counter. Turn it on and set it to weigh in grams.
- 4 Place a mixing bowl on your kitchen scale and tare/zero the scale.*
- 5 Add the designated amounts of chopped cabbage, green onions, carrots, and kimchi spices.
- 6 Remove the bowl from the scale and set it aside. Place a small, empty bowl on your scale and tare/zero the scale. Weigh out the salt.
- 7 Add the salt into the bowl with the cabbage, and mix with your hands until the cabbage becomes wet.*
- 8 Place your empty, clean mason jar on the scale, and tare/zero the scale. Make sure your scale is still set to grams, and add the water to your mason jar.
- 9 Add the measured water into the bowl with the cabbage and salt. Mix everything well.
- 10 Starting with the liquid, add the entire contents of the bowl into your jar, and pack everything down using a tamper, wooden spoon, or your hand.
- 11 Place your glass fermentation weight in the jar, submerging the cabbage pieces and weight fully into the liquid. If you don't have enough liquid, place your glass fermentation weight in the jar and submerge as much as possible. Over the next 12 hours, the cabbage should release more liquid, and you can press down your fermentation weight below the brine.
- 12 Secure the solid lid to the jar. ***You do not need to tighten it all the way. Just secure the lid but leave it ever so slightly loose, so the gas doesn't build up too much.***
- 13 Ferment for 21-28 days, then remove the weight and refrigerate. Don't forget to burp the jar daily during the bubbly phase, making sure everything stays submerged.

KIMCHI RECIPE NOTES

This recipe calls for my kimchi spice blend. I blend these spices in bulk and keep them in an airtight jar so I can easily use the kimchi spice whenever I want to start a new batch.

This is a dry spice blend, and I use organic bulk spices from Starwest Botanicals.

Here is how I make it:

1

You will need 455 grams gochugaru chili flakes, 300 grams minced garlic, 100 grams ginger powder, and 75 grams kelp granules.

2

Mix the ingredients in a large bowl until evenly combined.

3

Store in an airtight container, such as a mason jar or weck jar.

large batch sauerkraut

2-GALLON RECIPE
(CERAMIC CROCK OR LARGE JARS)

Ingredients

2-Gallon Crock Recipe (see notes for other volumes)

- 3,575 grams cabbage
- 825 grams water
- 550 grams leeks, chopped*
- 550 grams celery, chopped*
- 138 grams sea salt
- outer cabbage leaves

Equipment

- Lead-free Ceramic Crock**
- Crock lid
- Ceramic Crock Weight
- Tight weave cloth
- rubber band or twine
- Kitchen scale
- Large mixing bowls
- Knife
- Cutting Board
- Colander



SAUERKRAUT IN A CROCK INSTRUCTIONS

- 1 Wash all of your equipment well. Wash your crock, lid, and weights with natural soap and hot water. Rise all the soap away, then rinse with distilled white vinegar. For new or thrifted weights, wash with hot water and soap, then soak the unglazed ceramic weights in 10% salt water for a few hours.
- 2 Remove the outer cabbage leaves, keeping them as intact as possible. Rinse them with cool water and set aside.
- 3 Rinse the cabbage and other vegetables.
- 4 Using a kitchen scale, weigh out the designated amounts of cabbage, leeks, and celery in grams. I like to quarter the cabbages and weigh them in chunks before chopping them into shreds.
- 5 Chop your cabbage, leeks, and celery (or whatever vegetables/fruit you're adding in). If using leeks, rinse them in a colander after chopping since they can hold dirt.
- 6 In a separate small bowl, weigh the designated amount of sea salt.
- 7 In a pitcher or large mason jar, measure out the water.
- 8 Dissolve about half the sea salt in the water and set the other half aside.
- 9 Place your crock near where you plan to store it for the duration of fermentation. Once full, it will be very heavy and difficult to move.
- 10 Layer some chopped cabbage, leeks, celery, and a little bit of sea salt into the crock. Toss it around to mix in the salt as you go, and tamper it down with your fist. Keep layering, mixing, and tamping until you've added all the salt and vegetables.
- 11 Wipe the sides with your hands to make sure no vegetable pieces are stuck to the sides. There should be a good bit of headspace in the crock. You need this headspace to allow room for the weights and brine release.
- 12 Take the reserved outer cabbage leaves and tuck everything in. Tuck the cabbage leaves over the top and around the sides, securing all the cabbage shreds under the large leaves.
- 13 Place the weight onto the leaves.
- 14 Pour the salt water over the top.
- 15 Place the lid and tight weave cloth on the crock. You can secure the tight-weave cloth under the lid or over it with twine or a rubber band, but you need this to prevent fruit flies from getting in.
- 16 Allow the sauerkraut to ferment in the crock at room temperature for 21-28 days.
- 17 Open the crock once a day to check and make sure the sides and lid are clean, and everything is submerged. If necessary, press down on the weight with clean hands to release the gases.
- 18 After fermentation at room temperature for 21-28 days, remove the weight and the outer leaves. Pack the sauerkraut into jars, top with brine, and store in the refrigerator.

SAUERKRAUT IN A CROCK RECIPE NOTES

Notes

1-Gallon Crock

- ✳ 1,788 grams cabbage
- ✳ 412 grams water
- ✳ 275 grams leeks, chopped
- ✳ 275 grams celery chopped
- ✳ 69 grams sea salt

3-Gallon Crock

- ✳ 5,363 grams cabbage
- ✳ 1,237 grams water
- ✳ 825 grams leeks, chopped
- ✳ 825 grams celery, chopped
- ✳ 206 grams sea salt

5-Gallon Crock

- ✳ 8,938 grams cabbage
- ✳ 2,062 grams water
- ✳ 1,375 grams leeks, chopped
- ✳ 1,375 grams celery, chopped
- ✳ 344 grams sea salt

For any other crock size variations use one of the recipes above and double it. For example, if you have a 4-gallon crock, double the 2-gallon recipe. If you have a 6-gallon crock, double the 3-gallon recipe.

I used leeks and celery in this recipe, but you can use any fruit or vegetable instead, just keep the amounts the same.



from jar to table

TROUBLESHOOTING AND CARING FOR YOUR FERMENTS



FOUR MAIN things to remember

1

TIME

For best results, ferment at room temperature for 21-28 days before refrigerating.

2

TEMPERATURE

Keep it at a moderate room temperature. Between 60-80 degrees is great. (remember hotter = faster; colder = slower)

3

KEEP IT CLEAN

Open the jar regularly (once a day) and make sure the lid is clean.

4

KEEP IT SUBMERGED

Open the jar regularly (once a day) and make sure everything is submerged. Tamper everything back down, and tuck floaties back below the brine with a clean fork.



burping the jar

1

You can remove the lid entirely and rinse it. Tamper everything back down below the brine.

2

You can adjust the fermentation weight with a clean fork to re-submerge. Do not worry about “letting air in”

3

Keep the jar in a dish to catch spills. If you find your weight isn't a snug fit, use outer cabbage leaves under the weight to tuck everything.

FAQ

YOUR QUESTIONS ANSWERED

Q What if it's not very bubbly?

A It depends on the jar and lid. A mason jar with a screw lid, fully tightened, will trap CO₂. A weck jar without the gasket lets CO₂ out. You only see bubbles if the carbonation builds up in the jar or between vegetable pieces.

Q My sauerkraut is cloudy and there is a lot of sediment in the jar?

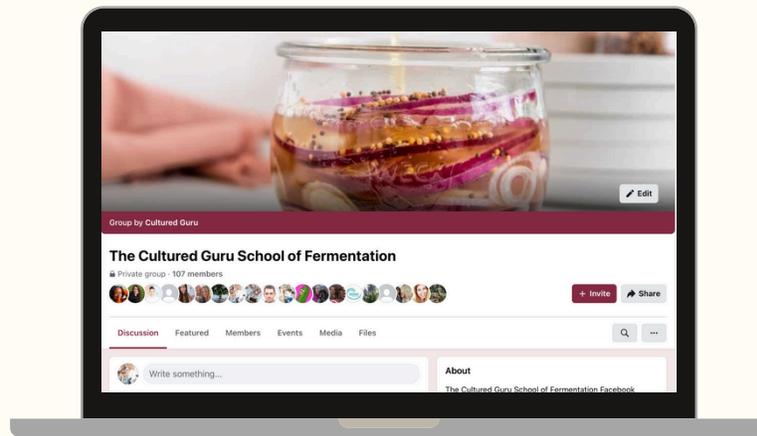
A Then you did it right! You want to see cloudiness and sediment. Cloudiness is a visual indicator that billions of beneficial bacteria are thriving. It's like seeing nature's version of spectrophotometry right in your kitchen.

Q How do I know it's safe to eat?

A The best way to know if your sauerkraut or kimchi is safe is to test the pH with a pH strip that measures 0-7 or 0-14. The pH should be below 4.

join the FB group

TO CONNECT AND ASK QUESTIONS



This Facebook group is non-essential to the course, so don't worry if you do not have Facebook!

The group is simply a place for students to post pictures, ask questions, and connect.

You are always welcome to email me at kaitlynn@cultured.guru to ask questions instead.

CLICK THE LINK BELOW &

join now

<https://www.facebook.com/groups/CulturedGurus>