

FREE GUIDE

Chamber Vacuum Fermentation

A professional kitchen technique adapted for home use.
Days, not weeks.

GREEN HOLMES

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Why the technique matters

Most people who try to ferment at home quit within a month. Not because the science is hard, but because traditional fermentation demands a week of patience for every batch, a crock taking up bench space, and a single flavour profile locked in from day one.

Chamber vacuum fermentation is the technique that changed this. It has been used in professional kitchens for years, and the same science that makes it work at restaurant scale works just as well at home.

The result is fermented food in days, not weeks. The same beneficial bacteria. The same measurable outcomes for gut microbiome diversity and inflammatory markers. Just without the calendar blocking and the bench clutter.

"Fermentation is biochemistry. Salt, time, and beneficial bacteria do the work. The chamber vacuum just changes the conditions they work in."

THE SCIENCE

What a vacuum actually does

When you seal salted cabbage under vacuum, the rapid pressure change physically ruptures the cell walls of the vegetable. This mechanical breakdown releases the cell's own moisture, which combines with the salt to create the fermentation environment from within the tissue itself. No added water or brine is required.

With the cell walls broken and salt distributed through the tissue, lactic acid bacteria establish dominance quickly. They outcompete pathogenic bacteria before those bacteria have a chance to establish. The process begins within hours rather than requiring days of slow surface diffusion.

Research by Wastyk et al. published in Cell (2021) confirmed that consistent exposure to live bacterial cultures, not the complexity of ingredients, drives microbiome diversity outcomes. A neutral base fermented under vacuum delivers the same bacterial load as a traditionally fermented batch.

Step-by-step process

What you need

Equipment	Notes
Chamber vacuum sealer	Not a suction/edge sealer. Must be a chamber unit.
Vacuum seal bags	Compostable bags work well. Purpose-made chamber bags are best.
Digital kitchen scale	Salt ratio is by weight. Guessing does not work reliably.
Sharp knife or mandoline	Consistent slice thickness ensures even fermentation.
Large mixing bowl	For massaging the cabbage and collecting brine.

On chamber vacuum sealers: the technology differs from the edge-style vacuum bags sold at most appliance stores. A chamber unit evacuates the entire interior of the chamber, including the bag. This is what creates the pressure differential that drives brine penetration. Edge sealers remove air from the bag only and do not produce the same result.

Ingredients

Ingredient	Amount	Notes
Green or white cabbage	900g (approx 1 head)	Outer leaves removed
Non-iodised salt	18g (2% by weight)	Fine sea salt or kosher salt

Salt ratio is critical. Too little and bacteria cannot dominate. Too much and you suppress the fermentation entirely. Weigh your cabbage after trimming and calculate accordingly.

The method

01 Slice

Halve the cabbage and remove the core. Slice thinly and consistently — roughly 2 to 3mm. Consistent thickness matters for even salt penetration. A mandoline is useful but not required.

02 Salt and massage

Weigh the sliced cabbage. Calculate 2% of that weight in non-iodised salt. Distribute the salt evenly and massage firmly for 3 to 5 minutes until the cabbage wilts noticeably. Some moisture will release — this is normal, but no standing brine is needed.

03 Pack the bag

Transfer the cabbage into a vacuum seal bag. Pack firmly to eliminate air pockets within the mass. The vacuum will do the rest — there is no need to cover the cabbage with brine or ensure submersion. Leave adequate headspace at the top for a clean seal.

04 Chamber vacuum seal

Place the filled bag in the chamber vacuum sealer. Seal at the highest vacuum setting available, typically 99 to 100 percent. The brine will bubble during evacuation — this is normal. Seal while still under vacuum.

05 Rest at room temperature

Leave the sealed bag at room temperature for 1 to 3 days depending on ambient temperature and desired tang level. Check daily. The cabbage will shift from pale to a slightly translucent, deeper colour as fermentation progresses.

06 Refrigerate

Once the tang level is right, refrigerate immediately. Fermentation slows dramatically in cold storage. Shelf life is 4 to 6 weeks sealed, longer once the bag is opened and consumed within 2 to 3 weeks.

Temperature affects speed. Warmer ambient temperatures (22 to 26C) accelerate the process. Cooler environments (18 to 20C) slow it. In summer, check at 24 hours. In winter, expect closer to 3 days.

Days, not weeks

The core advantage of chamber vacuum fermentation is time. Traditional fermentation at room temperature requires 5 to 21 days depending on the ferment, ambient temperature, and desired acidity. Chamber vacuum reduces that to days.

	Chamber Vacuum	Traditional
Sauerkraut	1 to 2 days	3 to 7 days
Kimchi	1 to 3 days	5 to 14 days
Pickles	1 to 2 days	3 to 10 days
Fermented vegetables	1 to 3 days	7 to 21 days

Times are approximate and vary with ambient temperature, salt concentration, and desired level of acidity. These ranges assume standard room temperature of 20 to 24C.

TROUBLESHOOTING

When something goes wrong

Issue	Fix
Cabbage is dry after massaging	Massage more firmly for 3 to 5 minutes. The vacuum will break down the cell walls and release moisture during the seal process. If the cabbage still seems very dry before sealing, the head may have been old or dehydrated — use a fresher head.
White film on the surface	This is kahm yeast. It appears when the bag is opened and the ferment is exposed to air. It is harmless — skim it off and reseal or consume within a few days.
Mushy texture	The ferment ran too warm or too long. Reduce rest time by 30 minutes. Keep bags away from direct sun or heat sources during rest.
No tang after expected time	Salt may be too high, suppressing bacteria. Check ratio: 2% by weight is the target. Also ensure the bag was properly sealed.

Issue	Fix
Brine leaked from bag	Seal quality issue. Reseal and re-vacuum immediately. Check bag for micro-tears before use.

Beyond the base

Once you have a consistent ferment, the natural next question is what to do with it. The base itself, a mild, tangy, versatile cabbage ferment, works as a condiment, a side, or an ingredient in nearly any cuisine.

The approach explored in further Green Holmes protocols is to keep the base neutral and add compounds at the time of serving: fats, spices, and bioactive ingredients that do not belong in the fermentation vessel. This keeps one batch flexible across many different meals and goals.

Curcumin and gingerol are fat-soluble compounds. They extract poorly in water and require a fat carrier to reach bioavailability levels worth noting. Adding them via an MCT oil base at serving time, rather than during fermentation, preserves both the flavour of the base and the potency of the compounds.

Serving combinations to start with

Recovery

Turmeric + cracked black pepper + a few drops of MCT oil. The piperine in black pepper increases curcumin bioavailability significantly. Use this pairing within 2 hours of training.

Digestion

Caraway seeds + a small amount of minced raw garlic. Caraway is traditionally carminative. Garlic provides allicin, which acts as a prebiotic substrate for beneficial bacteria.

Neutral

Good quality olive oil and fresh herbs. For meals where the ferment is a supporting player, not the main event.

Training day

Ginger + cracked black pepper. Gingerol in fresh ginger has analgesic and anti-inflammatory properties. Use pre or post-session.

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Field Notes, protocols, and research at greenholmes.com.au

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