

# Safely Ferment Fruits and Vegetables at Home

## FERMENTED FRUITS AND VEGETABLES

**DEFINED:** Fermented fruits and vegetables are foods made through desired microbial growth and enzymatic conversions of food components.

Most fruit and vegetable fermentations rely on the growth of lactic acid bacteria and are sometimes known as lacto-fermentations.

## Food Safety Risks

### Biological Hazards

#### *Clostridium botulinum*

- Botulism can occur if fermentation is not successful and acid levels are low
- These bacteria grow in oxygen-free conditions in low acid foods (foods with a pH above 4.6)
- The growth of beneficial microbes during fermentation will produce acid
- The production of sufficient acid will inhibit the growth of *Clostridium botulinum*

#### Enteric pathogens

- Includes certain bacteria (Shiga toxin producing *Esherichia coli* and *Salmonella* spp.), viruses, and parasites that cause gastrointestinal diseases
- Pose a risk if proper sanitation and fermentation practices are not followed

### Chemical Hazards - Biogenic amines

- Produced by some lactic acid bacteria
- Can cause allergic responses and may have toxicity when present at high levels

### Physical Hazards - Carbon dioxide (CO<sub>2</sub>)

- In an airtight container, gas produced by fermentation may cause breakage

## Fermentation Success Key #1

**Proper sanitation.** This includes thorough washing of hands prior to fermentation. Wash all containers and utensils using soap and potable water. Sanitize

## Fermentation Success Key #2

**Use high quality ingredients.** Start with fresh fruits and vegetables that have not started to decay. Produce that has started to spoil will not ferment due to the presence of high numbers of undesirable microorganisms.

## Fermentation Success Key #3

**Follow a researched and tested recipe.** To find reliable information for safe fermentation of fruits and vegetables look at the National Center for Home Food Preservation, the USDA, and University Extension. If you are unsure about the safety of a fermented product, “when in doubt throw it out.”

**“QUICK” PICKLES ARE NOT FERMENTED:** “Quick” pickles are produced by the addition of an acid (like vinegar) and not through microbial growth. These “quick” pickles have different risks and safety considerations compared to fermented fruits and vegetables.

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References available at <https://www.eatlac.org/>