

# Classification of Foods

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- Determine extent of heat processing and time-temperature combination
- Classified based on acidity – pH influences microbial spoilage
  1. High acid – pH < 4.5
    - e.g. Fish marinades, pickles, citrus juices
    - Acetic, citric, lactic acids – destroy food spoilage bacteria
    - Heat processed at 100°C or below – destroy vegetative cells
    - Acid tolerant bacteria – *Lactobacillus* – survive acid pH – heated at 100°C for longer than usual

## 2. Medium acid – pH 4.5-5.3

e.g. Canned fish in tomato sauce, soups

- Heat processed at 100 °C

## 3. Low acid – pH >5.3

e.g. Canned fish in oil, brine, curry

- Complete heat sterilization

- Acidity of food

1. High acid
2. Medium acid
3. Low acid

- Heat treatment

5 min at 80 °C  
(pasteurization)

15 min at 100 °C

60 min at 121.1 °C

- *Clostridium botulinum* – most heat resistant of food poisoning organisms – spore forming, anaerobic pathogen - growth inhibited at pH 4.5
- Canned fish – neutral pH – heat processed, assuming *C.botulinum* to be present – eliminated

- *Bacillus stearothermophilus* – heat resistant spore former – survives thermal process designed for *C.botulinum*
- Complete destruction – overcook fish and affect quality
- Avoid contamination with *B. stearothermophilus* – hygienic handling, processing and storage