

MICROBIAL GROWTH REQUIREMENTS/CONTROLLING THEIR GROWTH

7/1/8~, 2/28/96, 7/17/96, 3/5/97, 3/4/98, 1 March 00, 28 Feb 01, 2 March 05, 4Mar09

REQUIREMENTS CHNOPS, trace elements

WATER Dessication, drying

TEMPERATURE psychrophiles, mesophiles, thermophiles (draw graph, temp vs growth)
Boiling, Pasteurization, 63 C/30 min, 72 C/15 sec
Refrigeration, freezing

NUTRITION many pathogens are fastidious, require rich nutrients
Cleanliness reduces bacterial growth by removing nutrients

OSMOTIC halophiles, preservation in hypertonic solutions

pH pH optimum for enzymes determines, vaginal pH due to Lactobacillus, yogurt, pickles

OXYGEN aerobic fungi only grow on top of liquid food. Pseudomonas
facultative obligate E. Coli etc. Grow better with O₂, can grow in absense
anaerobic Clostridium in canning etc.

ANTISEPTICS damage cellular components of bacteria, inhibit their growth

TARGETS:

MEMBRANES	alcohols, phenol
ENZYME	heavy metals, halogens
CELL WALL	lysozyme, penicillin
DNA	UV light, radiation

Prevent stinky wash cloth? Rinse out well (remove nutrients)
Let dry thoroughly (dessication)
Hang in sun (UV damages DNA)

FOOD POISONING BACTERIA

Can be infection or intoxication.

Salmonella chicken, causes diarrhea, possibly bloody.

Staphylococcus enterotoxin, intoxication, 24 hours

Clostridium **botulinum:** anaerobic, neutral, rich medium, toxin prevents release of Acetylcholine

other intoxication:

tetani: wound infection, toxin prevents relaxation of opposing muscles

Preservation Drying
Salt, Sugar
Acid
refrigeration

Preventing infections of minor wounds: 1) scrub out all dirt (toothbrush and soap in necessary)
2) apply strong antiseptic (70% EtOH for instance)
3) cover with sterile bandage, allows air in
4) keep dry and clean, replace bandage if needed