MICROBIAL GROWTH REQUIREMENTS/CONTROLLING THEIR GROWTH

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
- Faculative obligate: E. Coli etc. Grow better with O2, can grow in absence
- 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