CHAPTER 11: CONTROLLING THE MICROBIOLOGICAL QUALITY OF FOODS

11.1 QUALITY AND CRITERIA

- Quality = degree of excellence $\rightarrow$ how good it is at serving its purpose
- Quality comprises of three aspects
  - Safety
  - Acceptability/ shelf-life
  - Consistency (w.r.t safety and shelf-life)
- Regulatory bodies and the food industry most actively interested in determining and controlling the microbiological quality of foods
  - Regulatory bodies = protect public
  - Commercial companies = to protect and enhance their good name and their market
- To distinguish between acceptable and unacceptable quality, need a microbiological criterion
- Three different types of criteria as defined by ICMSF (International Commission on Microbiological Specifications for Foods)
  - Microbiological STANDARD
    - Criterion specified in law/regulation
    - Legal requirement the foods must meet
    - Enforceable by regulatory agency
  - Microbiological SPECIFICATION
    - Criterion applied in commerce
    - Contractual condition of acceptance
    - Applied by purchaser
    - Failure of compliance from supplier will lead to rejection/lower price
  - Microbiological GUIDELINE
    - Used to monitor the microbiological acceptability
    - Advisory and not mandatory
- What should be included in a microbiological criterion
  - Statement of the food to which the criterion applies
  - Statement of the microorganisms/toxins of concern
  - Details of analytical methods to be used to detect and quantify
  - Number and size of samples to be taken
  - Microbiological limits and the number of sample results which must conform to these limits
    - n = number of samples to be tested
    - c = maximum allowable number of samples which can $> m$ before the lot is rejected (two-class attributes plan) **OR** the maximum allowable number of samples which may fall into the marginally acceptable category before the lot is rejected (three-class attributes plan)
    - 11.2
      - m = count above which the sample is regarded as defective (two-class attributes plan) **OR** count which separates good quality from marginal quality and which most test samples should not exceed (three-class attributes plan)
    - M = count if exceeded by any of the samples will lead to rejection of whole lot (three-class attributes plan)
- However, microorganisms are rarely distributed uniformly or randomly in food $\rightarrow$ resulting distribution = contagious distribution, which contains aggregates of cells
- As the number of samples tested $\uparrow$, the confidence in the result $\uparrow$, but the cost of testing also $\uparrow$ = thus a compromise must be struck between what is practical and what gives the best estimate of lot quality