**Chapter 9: Fish Health and Diseases** ([Chapter 9](Chapter%209.pdf))

* Managing [fish health](Lecture%2012%20Fish%20Health%20and%20Biosecurity.pdf) and diseases
  + Due to the high stocking densities and potential for stress, cultured fish are far more susceptible to [diseases](Fish%20disease%20and%20parasites%20-%20Wikipedia.html).
  + A farmer must be vigilant and monitor fish behaviour closely to detect issues early.
  + There are two basic types of disease:
    - [Infectious diseases](Fish%20Diseases.html) are more difficult to treat and control and can result in the complete loss of a population.
      * Caused by a pathogen (Bacteria, fungus or parasite)
    - Non-infectious diseases are more easily prevented through good farm management.
      * Include nutritional, environmental and genetic problems
  + Early [warning signs](sings%20of%20disease%20in%20aquaculture%20-%20Google%20Search.html) of stress or disease include:
    - Erratic swimming
    - Poor feeding
    - Dark Colour
    - Gulping for air
    - Lethargy
  + The [gills](infected%20gills%20-%20Google%20Search.html) are highly sensitive and are often the first organ to be affected, check the colour of the gills, if they appear pale (anaemic) or damaged this is a sign of disease.
    - Close inspection of gills under a microscope can help to identify gill [parasites](gill%20parasite%20-%20Google%20Search.html). Infections will reduce the fishes ability to breath and can lead to death.
* [Prevention](GAP4.pdf) is better than cure and the best form of prevention is good farm management which includes:
  + Maintaining good [water quality](How%20to%20Achieve%20Good%20Water%20Quality%20Management%20in%20Aquaculture%20_%20The%20Fish%20Site.html) at all times
    - Ensure dissolved oxygen levels are above 5mg/l at all times.
    - Ensure pH is between 6.5-8 at all times
    - Ensure concentration of un-ionized ammonia does not exceed 0.02mg/l. Regular water exchange.
    - Ensure adequate flow at all times
    - Monitor and control temperature where possible.
  + Feed at regular intervals, in the same place. Monitor the fish as you feed them.
    - Use fresh, good quality feed.
    - Store in a cool, dry place off the ground.
  + Regular size sorting
    - Do not over stock and maintain desired densities
  + Immediately remove any dead fish from the ponds.
  + Record everything. Know your farm.
  + Practice good [biosecurity.](Biosecurity%20on%20the%20Farm%20Guidelines%20&%20Resources%20for%20Developing%20a%20Biosecurity%20Plan%20_%20The%20Fish%20Site.html)
    - Do not put hands in the water.
    - Use disinfectant foot bath and hand wash whenever you leave and/or enter a section.
    - Always clean and disinfect equipment such as nets, feeding tubs, scales, etc.
    - Control entry to the farm and make sure biosecurity protocols are followed.
* [Treatment](An%20Introduction%20to%20Fish%20Health%20Management%20_%20The%20Fish%20Site.html)
  + Treatment of fish diseases can be complicated and it is advisable to call a state vet assist in prescribing and administering treatments.
  + There are some basic step a farmer can take
    - Stop feeding
    - Increase water flow rate or conduct a water exchange
    - Aerate the water
* [FAQ](FAQ%20-%20Chapter%209.pdf)
* **Videos**
  + Aquaculture Biosecurity <https://www.youtube.com/watch?v=VDUvQf_sDLM>
  + On-farm biosecurity - managing footwear <https://www.youtube.com/watch?v=FlxbM4Zb6es>
  + Fish Health: What you need to know as an aquaculture producer <https://www.ncrac.org/video/fish-health-what-you-need-know-aquaculture-producer>