



Tikrit University  
College of Veterinary Medicine

# ***Environmental diseases***

Subject name: Fish diseases

Subject year: 5<sup>th</sup> stage

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SCAN ME  
Lecturers link

*Miscellaneous non-infectious*

*Environmental diseases*  
**1-Hypoxia or (Asphyxia)**

The carp fish need 5-7 mg O<sub>2</sub> / 1L. of water, found different factors which lead to decrease the O<sub>2</sub> concentration in pond like increase the temperature particularly in summer, bad quality of water, high density of fish in the rearing ponds & present the plants in the ponds.

**Signs**

- 1- Fish congregating at water inlets or near edges
- 2- Acute mortality
- 3- Dead fish having pale appearance and blotchy skin.
- 4- Darkening of skin
- 5- Open mouth and flared opercular

**Diagnosis**

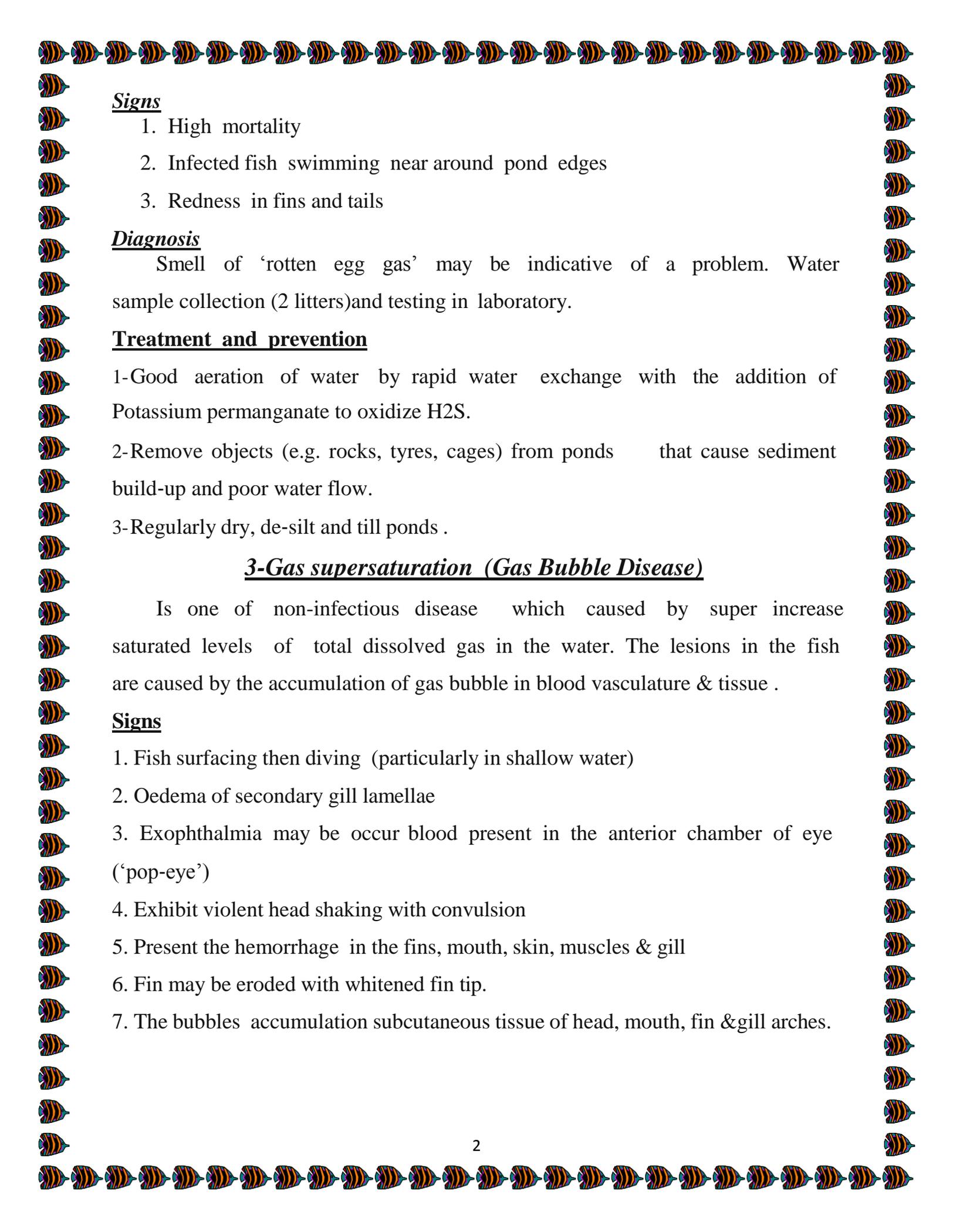
Regular observation of fish and ponds. Routine daily monitoring of DO (early morning) using a high quality calibrated meter.

**Treatment and Prevention**

- 1- Provide good water (which having higher D.O. levels).
- 2- Avoid formalin treatments when above 25°C water temperature
- 3- Avoid overcrowding
- 4- Reduce feeding during periods of high water temperature (>28°C).

**2- Hydrogen sulphide poisoning**

Hydrogen sulphide (H<sub>2</sub>S) is commonly known as 'rotten egg gas' due to its strong, distinctive and pungent smell, it can cause rapid death.



### Signs

1. High mortality
2. Infected fish swimming near around pond edges
3. Redness in fins and tails

### Diagnosis

Smell of 'rotten egg gas' may be indicative of a problem. Water sample collection (2 liters) and testing in laboratory.

### Treatment and prevention

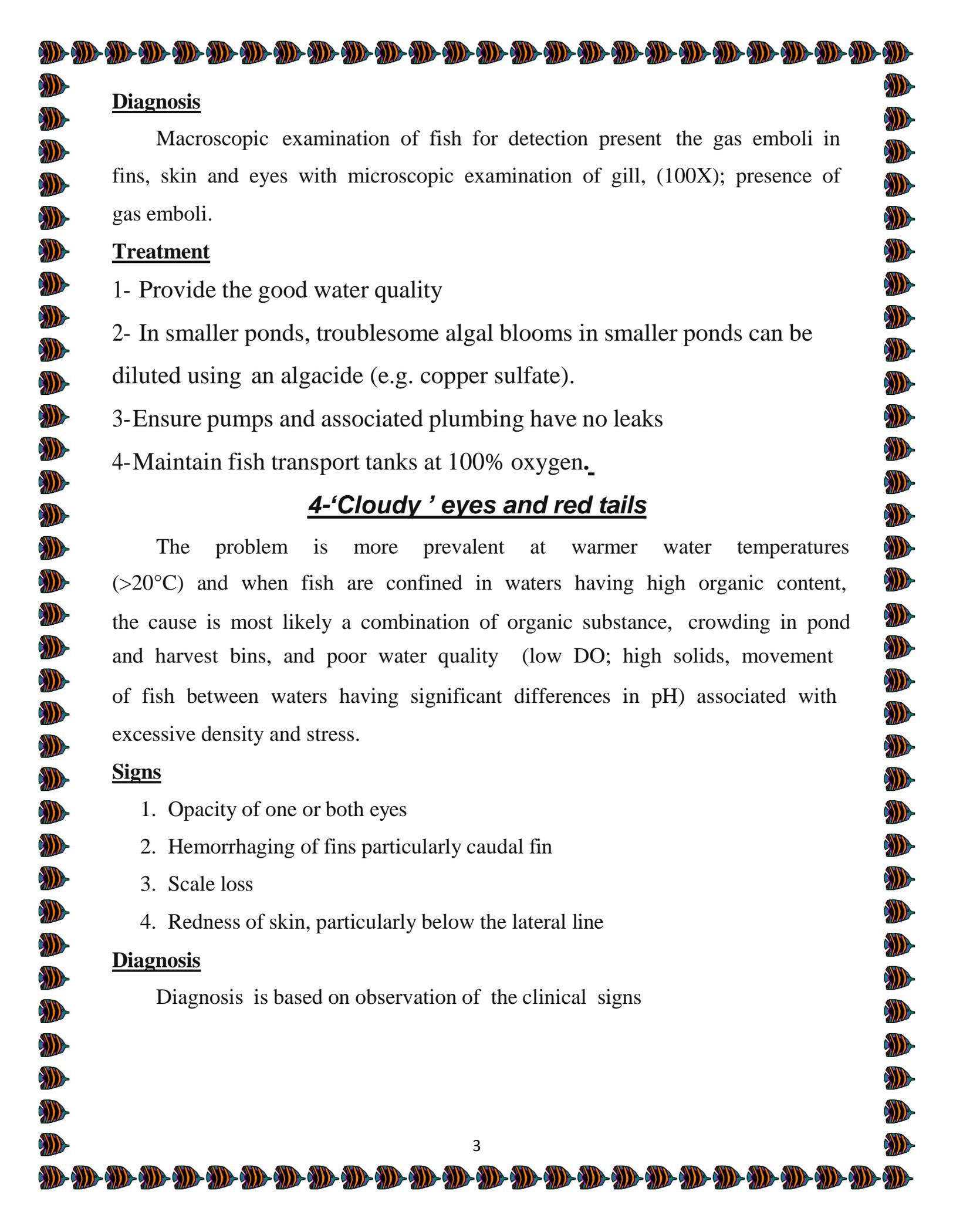
- 1-Good aeration of water by rapid water exchange with the addition of Potassium permanganate to oxidize H<sub>2</sub>S.
- 2-Remove objects (e.g. rocks, tyres, cages) from ponds that cause sediment build-up and poor water flow.
- 3-Regularly dry, de-silt and till ponds .

### **3-Gas supersaturation (Gas Bubble Disease)**

Is one of non-infectious disease which caused by super increase saturated levels of total dissolved gas in the water. The lesions in the fish are caused by the accumulation of gas bubble in blood vasculature & tissue .

### Signs

1. Fish surfacing then diving (particularly in shallow water)
2. Oedema of secondary gill lamellae
3. Exophthalmia may be occur blood present in the anterior chamber of eye ('pop-eye')
4. Exhibit violent head shaking with convulsion
5. Present the hemorrhage in the fins, mouth, skin, muscles & gill
6. Fin may be eroded with whitened fin tip.
7. The bubbles accumulation subcutaneous tissue of head, mouth, fin & gill arches.



## Diagnosis

Macroscopic examination of fish for detection present the gas emboli in fins, skin and eyes with microscopic examination of gill, (100X); presence of gas emboli.

## Treatment

- 1- Provide the good water quality
- 2- In smaller ponds, troublesome algal blooms in smaller ponds can be diluted using an algacide (e.g. copper sulfate).
- 3-Ensure pumps and associated plumbing have no leaks
- 4-Maintain fish transport tanks at 100% oxygen.

### **4-‘Cloudy ’ eyes and red tails**

The problem is more prevalent at warmer water temperatures (>20°C) and when fish are confined in waters having high organic content, the cause is most likely a combination of organic substance, crowding in pond and harvest bins, and poor water quality (low DO; high solids, movement of fish between waters having significant differences in pH) associated with excessive density and stress.

## Signs

1. Opacity of one or both eyes
2. Hemorrhaging of fins particularly caudal fin
3. Scale loss
4. Redness of skin, particularly below the lateral line

## Diagnosis

Diagnosis is based on observation of the clinical signs

## Treatment and Prevention

- 1- Hold fish at stocking density  $<30 \text{ kg/m}^3$ .
- 2- Provide salt (NaCl) at  $2 \text{ g/L}$ .
- 3- Flush and retreat salt every 24 hrs. for first 2–3 days; maintain clean water and high aeration ( $\text{DO} >4 \text{ mg/L}$ ).
- 4- Secondary bacterial infections may require antibiotic treatment
- 5- Generally improvement in water quality, good husbandry and hygiene will help lesions resolve spontaneously.
- 6- Avoid fish harvesting in poor water quality and at high temperatures ( $>28^\circ\text{C}$ ).

Note :DO: meaning Dissolved Oxygen

### Volume conversions

1,000 mL (millilitres) = 1 L (litre)  
1,000 L = 1 m<sup>3</sup> (cubic metre)  
1,000,000 L = 1 ML (megalitre)  
Volume of water (round tank) =  $3.142 \times r^2$  (radius)  $\times$  d (depth)  
Volume of water (square tank) = l (length)  $\times$  w (width)  $\times$  d (depth)  
Volume of pond = length (m)  $\times$  width (m)  $\times$  mean depth (m)

### Weight conversions

1,000  $\mu\text{g}$  (micrograms) = 1 mg (milligram)  
1,000 mg = 1 g (gram) = 1 mL (millilitre) of water  
1,000 g = 1 kg (kilogram) = 1 L (litre) of water  
1,000 kg = 1 t (tonne) = 1 m<sup>3</sup> of water

### Length conversions

1,000  $\mu\text{m}$  (microns) = 1 mm (millimetre)  
10 mm = 1 cm (centimetre)  
1,000 mm = 100 cm = 1 m (metre)

### Area conversions

1 ha (hectare) = 10,000 m<sup>2</sup> = 2.5 acres  
1 acre = 0.4 ha = 4,000 m<sup>2</sup> (e.g. a pond measuring 50  $\times$  80 metres)

### Concentrations

ppm = part per million, ppt = part per thousand  
liquid chemical forms    solid chemical forms  
1 ppm = 1 L (litre) in 1,000,000 L = 1 mL in 1,000 L  
20 ppm = 20 L in 1,000,000 L = 20 mL in 1,000 L  
1 ppt = 1 mL in 1 L  
1 ppm = 1 mg in 1 L = 1 g in 1,000 L  
20 ppm = 20 mg in 1,000 L  
1 ppt = 20 g in 1 L  
5 ppt = 5 kg in 1,000 L