NITRATE (NO_3)

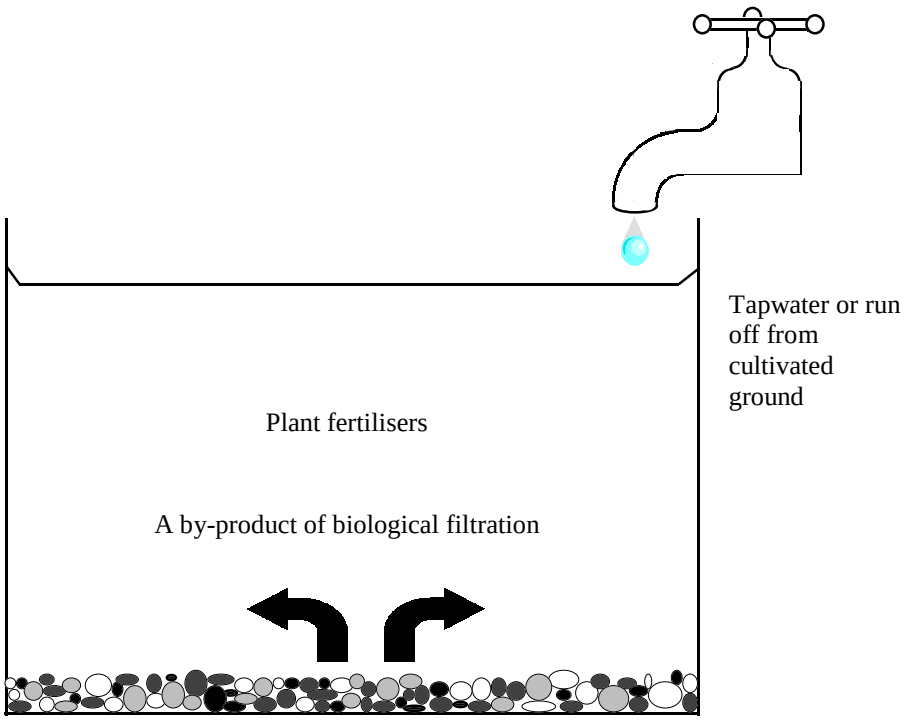
SOURCES

Nitrates are:

1. produced as *Nitrobacter* bacteria breaks down nitrites;
2. introduced in tap water;
3. plant fertilizers or run off from cultivated ground

Nitrate is the end product of the break-down of ammonia. Thus its presence indicates that the filter is functioning. In many cases the absence of nitrate is more worrying, as it may indicate the filter is not functioning.

Diagram 21: Sources of nitrate in an aquarium or pond



MEASUREMENT OF NITRATE

Test kits are available. (Some measure Nitrate-Nitrogen a conversion factor then being applied to obtain a true Nitrate reading; full instructions should be available with the kits used, see also notes on Water Quality Criteria).

SAFE LEVELS OF NITRATE

In the 'Water Quality Criteria', OATA recommends that nitrate levels in freshwater systems do not exceed those in the tap water supply by 50mg/l.

As the livestock is more sensitive in marine systems Nitrate should not exceed that in the water supply by 40mg/l.

Box 7: REDUCTION OF HIGH LEVELS:

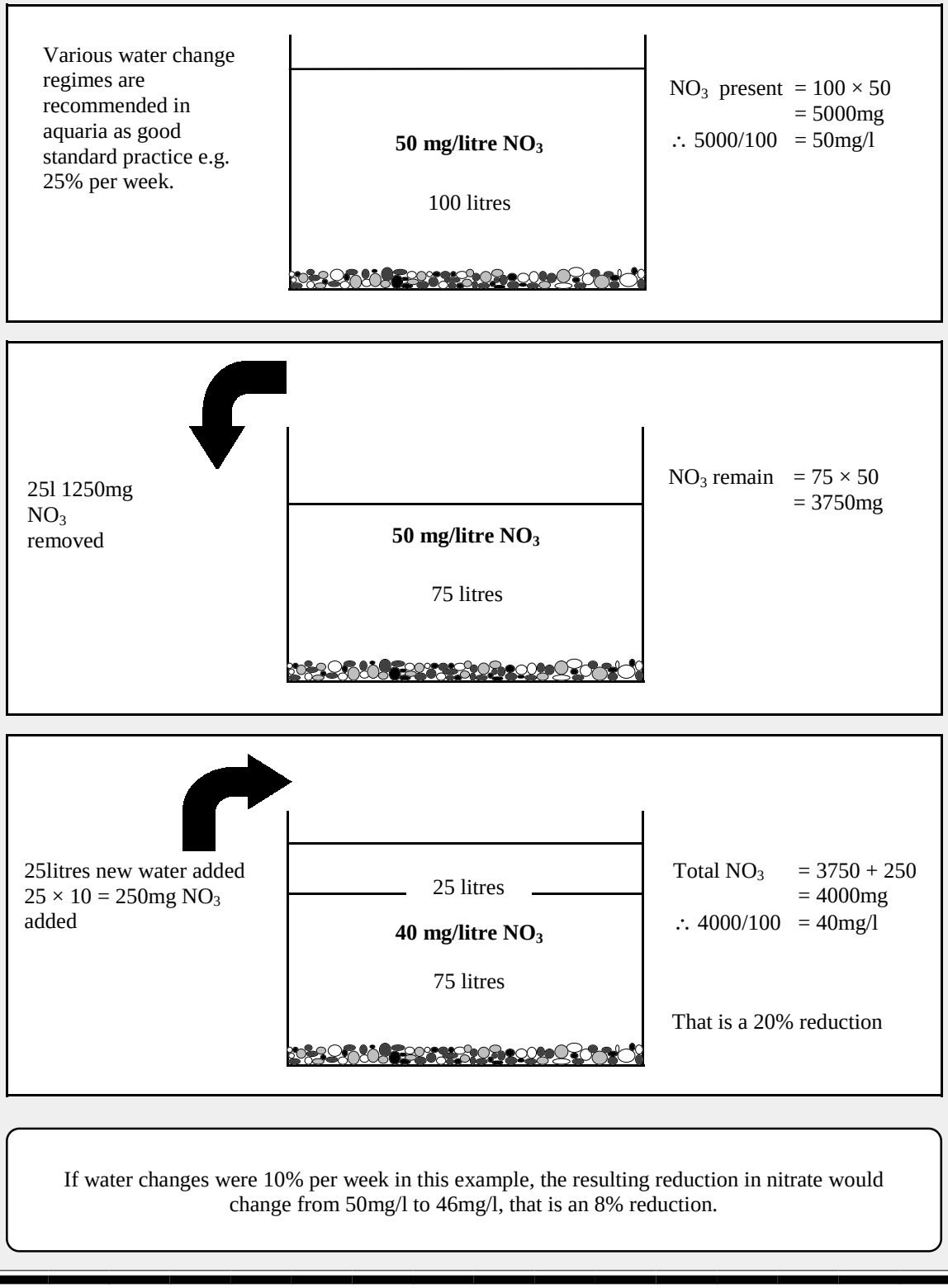
1. DILUTION BY WATER CHANGE-
   - some tap water in the UK has nitrate levels of 150ppm +. Thus care must be taken that the nitrate levels are not being <u>increased</u> by water changes.

2. USE OF ION EXCHANGE MATERIALS

3. INCREASE PLANT DENSITY -
   - nitrates are a fertiliser for plants. As plants grow they use up nitrates, so reducing their concentration in the water.

4. USE OF DENITRIFYING BIOLOGICAL FILTRATION
   - these anaerobic filters, when functioning correctly break nitrate down to nitrogen gas, which then bubbles out of the aquarium or pond. However, if they are not maintained correctly, or uncontrolled anaerobic areas build up in a filter system they may reverse the biological filtration process and produce ammonia.

Diagram : Dilution of nitrate by changing water; example one



If water changes were 10% per week in this example, the resulting reduction in nitrate would change from 50mg/l to 46mg/l, that is an 8% reduction.

Example two: an aquarium level of NO_3 of 90mg/l but the tap water is at 125mg/l.

After a 25% water change the level of NO_3 would be 99mg/l. So remember water changes may not always dilute nitrate.