Antibiotic use in animals and aquaculture in South Africa

Global Antibiotic Resistance Partnership

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Aquaculture

Marine

Abalone farms

Fresh water

Trout

Ornamentals

Bacterial infections of fish and shellfish

- Fish swim in the equivalent of a bacterial suspension
- They have adequate natural defence mechanisms against bacterial infections
- They only succumb to bacterial infections when stressed
- Identification and removal of the stressor is far more beneficial than antibiotics

Trout showing haemorrhagic septicaemia

Aeromonas hydrophila

Administration of antibiotics to fish and shellfish

- In feed – but sick animals stop feeding
- In water – feasible in fish tanks, but on large farms the flow rate washes antibiotic away
- Bath – but catching the fish and immersing it in a bath of diluted antibiotic is stressful
- Valuable specimens may be injected

Marine

- About 8 abalone [*Haliotis midae*] farms
- West Coast and South Coast up to Hermanus
- Minimal antibiotic use
- Flow rate too rapid for antibiotic administration in water
- Almost exclusively fed on kelp [*Ecklonia maxima*]
- Only juveniles fed Abfeed, where it would be possible to include an antibiotic

Trout Farms

- Trout require cold water
- Only trout farms are in the Lydenberg area and Drakensberg
- Rapid turnover of fish – ready for market at about 9 months
- Egg laying is seasonal, and eggs have to be imported during the winter

Trout Farms continued

- Strict quarantine measures for imported trout eggs to minimize disease transmission
- All the farms are intensive, with high stocking rates
- As there are several trout farms per river, the farmers tend to co-operate
- Residues should be monitored

Ornamental fish

- Most imported from the Far East
- Fish travel poorly by air, and they arrive stressed and susceptible to infections
- They carry very resistant bacteria with them as part of their normal flora
- Virtually no quarantine imposed
- Rapidly sold on via pet shops where they are mixed with fish already present

Ornamental Fish

- Generally kept in small tanks with recirculating water.
- Koi are kept in large ponds, but water is also recirculated
- Minimal contamination of the environment by the resistant bacteria
- Small amounts of antibiotics used to treat ornamental fish

Antibiotic use in animals

- Use is greatest in intensive farming – pigs and poultry
- Use is greatest in animals slaughtered at a relatively young age
- Dairy cows – mastitis
- Feed lots to fatten cattle before slaughter

Resistance correlated with disease

- Low levels of resistance in bacteria causing specific diseases which are not zoonotic
- Low levels of resistance when a disease is rapidly fatal
- High levels of resistance in bacteria causing chronic diseases
- High levels of resistance in enteric bacteria

Recommendations

- Prudent antimicrobial use
- Biosecurity on farms
- Increased levels of hygiene on farm
- Increased levels of hygiene during food processing
- Encouragement for increased residue detection in meat, milk and eggs