



Module 24

Welfare of Farmed Fish and Aquatic Invertebrates (Fish Welfare Part 2)

Student Activities

Questions

1. List two welfare concerns for farmed fish that are associated with freedom from hunger and thirst.

(2 marks)

Any two of the following:

- Starvation before transport or slaughter
- Feed reduction/starvation to keep fish off the market until prices rise
- High protein requirement of carnivores
- Aggression
- Malnutrition in juveniles
- Water quality.

2. List two welfare concerns for farmed fish that are associated with freedom from pain, injury and disease.

(2 marks)

Any two of the following:

- Human handling
- Injuries (from densely crowded cages)
- Diseases
- Vaccination lesions
- Morphological abnormalities

- Overcrowding
- Algal blooms and jellyfish.

3. List two welfare concerns for farmed fish that are associated with freedom from discomfort.

(2 marks)

Any two of the following:

- Extremes of temperature
- Lack of shelter
- Water quality.

4. List two welfare concerns for farmed fish that are associated with freedom from fear and distress.

(2 marks)

Any two of the following:

- Vulnerability to predators
- Handling
- Transport
- Overcrowding
- Slaughter

5. List two welfare concerns for farmed fish that are associated with freedom to express normal behaviour.

(2 marks)

Any two of the following:

- No environmental complexity and no environmental control
- Abnormal behaviours, e.g. vertical swimming, swimming in circles
- Assisted reproduction – salmon and trout.

6. Briefly describe the particular welfare concerns for transgenic farmed fish.

(4 marks)

(Two marks available for each bullet point below.)

- Higher growth rates are associated with reduced tolerance to disease and stress and with abnormalities in the cranium and operculum due to excessive cartilage deposition; this in turn causes feeding and breathing difficulties.

- Escapees could either displace wild fish or breed with them, introducing characteristics that are unsuited to the local environment. This would then undermine the wild fishes' genetic make-up so they produce young less able to survive in the wild.

7. Briefly describe, with examples, four animal-based measures of welfare in farmed fish.

(4 marks)

Any four of the following:

- Colour: Skin and eyes change colour in response to stress.
- Ventilation rate: increased opercular beats or flared opercula, caused by stress, gill disease, or poor water quality.
- Behaviour: immobility, increased swimming, escape attempts, rubbing; 'mouthing' at the surface of the water because of low oxygen in the water; 'flashing' (jumping or appearing briefly on their side on the surface of the water) because of parasite infection.
- Food intake: affected by many things, including temperature and social stress.
- Body condition: affected by food intake. Also mucus production, which is affected by disease and handling.
- Growth rate: affected by food intake and stress levels. Chronic stress (social, environmental, disease) may lead to slow growth.
- Mortality rate: can routinely be 20% or more.
- Morphology: e.g. abnormalities associated with triploidy in salmon.
- Injury: to fins, scars. May reflect poor holding facilities, bad handling, or overcrowding with aggression.
- Disease: may affect behaviour, e.g. rubbing to dislodge parasites, clinical signs such as cataracts.
- Reproductive performance: failure to breed when fed
- Stocking density: related to water flow rate; optimal density varies with species.

8. Name four ways to improve the welfare of fish killed for recreational purposes.**(4 marks)**

Any four of the following:

- Minimise the duration of angling
- Use the appropriate strength of line and land fish as quickly as possible
- Minimise air exposure and improve handling
- Land by hand if possible, not net
 - If in the net, it must have no knots
- Hold in coolers with good quality water, rather than in nets in the lake.
- Use humane fishing gear, e.g.
 - barbless hooks
 - avoid live bait
- Don't fish if the water temperature is very variable
- Kill by stunning first.

In-class activity

Discussion

This discussion uses the notion of sentience in marine invertebrates to explore the application of the precautionary principles of animal welfare. We suggest you allow approximately 30 minutes for this activity.

There is still a large amount of debate around the sentient capabilities of invertebrates. This discussion asks: what are the welfare implications of the amount of information we currently have about invertebrate sentience? Should we proceed from a precautionary approach, i.e. assume that marine invertebrates have a level of sentience that requires humans to apply the same standards of animal welfare as to any other sentient farmed/hunted creature? Or should we wait until we develop a stronger baseline of research before we make any major changes to how we treat marine invertebrates?

Divide the class into groups (try to aim for an even number); half of the groups will be charged with debating for a precautionary approach towards marine invertebrate animal welfare standards, while the other groups will be debating for waiting until we have gathered more evidence.

Each group should spend a few minutes brainstorming their central arguments. A spokesperson for each group should then present their central points to the rest of the class (if there's more than one group for each position then there may be some duplication of points, which is fine).

The groups should then come back together to discuss where they stand as individuals, with the lecturer summing up what they see as the class' overall feelings about the current treatment of marine invertebrates.

Key prompts:

- What would the effect be on the different stakeholders of taking a precautionary approach with regard to marine invertebrates or waiting until we have further evidence?
 - Fishermen – increased costs?
 - Animals – improved welfare?
 - Consumers – increased cost?
 - Everyone – environmental consequences?
- Where else could the precautionary approach be applied?
- What are the major advantages and disadvantages of such an approach?
- If we are waiting for further evidence, whose responsibility is it to obtain the data?