

Welfare issues in rainbow trout



Introduction

This summary covers 'on-growers' (trout between 100g and slaughter weight). For a full overview and detailed information on welfare issues in the commercial production of rainbow trout (including full references), please see the full information sheet titled "Improving the welfare of farmed rainbow trout"; <https://www.ciwfdocs.org/dm/linkspage.aspx?id=122148>

Physical wellbeing

Welfare Issue	Problem	Solution
Confinement/ overcrowding	Injury (descaling, snout and body damage, fin erosion), water quality is often compromised, social stress, disruption to reproductive functioning	Stocking density for on-growers in freshwater should be a maximum 15 kg/m ³ to allow for sufficient space for trout to live with one another with minimal injury and stress.
Inappropriate water temperature	Fish are unable to behaviourally thermoregulate when water temperature is too low or too high, causing physiological stress	Rainbow trout can adapt to temperatures between 4 and 18°C. Optimal, preferred temperature is 16°C.
Poor water quality	Lack of sufficient oxygen and a build-up of ammonia leads to increased risk of disease, compromised health and growth, potential organ damage	For highest welfare, use a spring water supply, or a river/lake water supply with as little pollution as possible. pH should be above 6.0. Dissolved oxygen levels should be above 7mg/L, and other relevant water constituents (e.g. CO ₂ , ammonia, phosphorus, salinity) should be regularly monitored.
Disease	Certain diseases are difficult to diagnose and classify at their early stages, which delays treatment/prevention	Fish should be monitored regularly for signs of health problems ¹ by a trained member of staff. When identified, diseased fish must be either treated without delay or humanely euthanised.
Exposure to air	Severe physiological stress; fear; discomfort; increased susceptibility to injury	Live fish should not be taken out of water without it being absolutely necessary. If this is the case, they should not be taken out of water for more than 15 seconds maximum.

¹ In rainbow trout the major concerns are flavobacteriosis (RTFS), red mark syndrome, puffy skin, enteric redmouth, and infectious pancreatic necrosis but also, lactococcosis, bacterial kidney disease, proliferative kidney disease, ichthyophthiriasis, saprolegniosis, columnaris and furunculosis (http://www.eurl-fish.eu/Activities/survey_and_diagnosis)

Physical wellbeing

Welfare Issue	Problem	Solution
Fasting	Hunger; physiological stress; fatigue	Fish must not be fasted for more than 72 hours this includes time for transport and holding time for processing.
Fin erosion	Increases risk of secondary bacterial infection; pain and discomfort likely	Handling should be as gentle as possible. Provide sufficient space and appropriate stocking density for fish to escape from one another.
Live transport (road)	Overcrowding; handling stress; water movement and changes in temperature; noise and vibrations in water; changes in light; build-up of waste. May all occur simultaneously with the potential to cause severe stress.	For best welfare, rainbow trout should not be transported while alive, and should be humanely slaughtered on-farm. If live transport is absolutely unavoidable, water quality should be constantly monitored during the journey. Additional oxygen should be available in case of delays. Stocking densities should be calculated in advance. A trained person must be present during the journey who is accountable for the welfare of the fish, and has knowledge of fish welfare principles. Handling should be kept to an absolute minimum during loading and unloading (e.g. through pumping), and sick/injured animals should not be transported.
Slaughter without effective stunning	Different methods for stunning and killing trout vary in how stressful and humane they are. CO ₂ exposure and asphyxia in ice are always stressful and inhumane, and should never be used. Although electrical and percussive stunning can be humane, there is potential for these methods to be applied incorrectly, with the risk of painful injuries and recovery of consciousness before death.	The use of a single method (i.e. percussive blow or electrocution) that both stuns (instantly) and kills is recommended above other methods where possible. Percussive or electrical stunning followed by a separate kill method (see below) is also acceptable, providing fish do not regain consciousness after stunning. Acceptable post-stun kill methods are: effectively performed percussion, decapitation, spiking/coring or by gill cutting (following an effective percussive stun and for large trout only). The use of carbon dioxide systems, live chilling in ice slurry, and leaving trout to asphyxiate in air, are unacceptable killing methods and must be phased out. A sample of fish should be evaluated for signs of consciousness ² . If any signs of consciousness are observed then stunning is likely to have been ineffective. If in any doubt as to whether a fish is unconscious, do not hesitate to repeat the stun or use an alternative, back-up method.

² It is difficult to reliably determine unconsciousness of fish (and therefore that stunning is effective) at the slaughterhouse (EEG measurements are required and this can only be measured in the lab) but it is important to ensure that there are no signs of consciousness after stunning. If any signs of consciousness are observed then stunning is likely to have been ineffective.

Mental wellbeing

Welfare Issue	Problem	Solution
Crowding	Severe and often chronic social stress (e.g. aggression); decreased water quality	Provide sufficient space and appropriate stocking density for fish to escape from one another.
Handling	Often involves being taken out of water	Only competent and fully trained staff should be allowed to handle the fish during procedures. Staff should be trained and have good knowledge of welfare issues, such as stress, faced by fish. Time out of water should never exceed 15 seconds for a live fish.
Barren environment	Chronic lack of cognitive, sensory and physical stimulation	Environmental enrichment should be provided where welfare benefits are clear, this may include the use of gentle currents provided oxygen levels are sufficient.

Natural behaviour

Welfare Issue	Problem	Solution
Aggression	Social conflict/competition may intensify when there is a lack of resources and space to escape; increased injury; social stress	If distributed across the water surface, sufficient feed must be provided to discourage high levels of competition for access to food. Self-access feeders may lead to more dominant fish preventing others from feeding. Provide sufficient space and stocking density.
Restriction of behavioural expression	Freedom of movement to swim is severely restricted; lack of space to escape from one another	Provide appropriate space and shelter for fish to rest and escape from one another.
Swimming behaviour	Sub-optimal water quality parameters (can lead to abnormal side swimming and surface swimming behaviour)	Monitor water quality parameters and introduce appropriate management strategies (for example providing additional oxygenation) if sudden changes or if levels fall outside optimal ranges.