



ANIMAL WELFARE & ETHICS

- [Animal Welfare Science](#)
- [Animal Ethics](#)
- [Companion Animals](#)
- [Production Animals](#)
- [Animals in the Wild](#)
- [Animals used in Research and for Teaching Purposes](#)
- [Animals used for Work, Sport, Recreation or Display](#)
- [Aquatic Animals](#)

Aquatic Animals

Introduction

The welfare of aquatic animals around the world has been subject to increasing attention over recent years, and this trend is set to continue. Veterinarians play an important role in dealing with a diverse range of aquatic animal species including marine mammals, fin fish, amphibians and invertebrates such as molluscs and crustaceans. With the increasing use of aquatic animals for farming, in research and as environmental sentinels (as early indicators of environmental issues), the demand for veterinary input has followed suit, and veterinary graduates need to be fully prepared for practising in these areas. Some of the important issues that veterinarians may face in regards to aquatic animal welfare and practice are outlined below.

Important terms and concepts:

Sentience in fish

The relatively small size of the cerebral hemispheres in fish has been used historically to support the argument that fish do not feel pain to the same extent as higher vertebrates. However, similarities in the structure of the nervous system and the sophisticated ability of fish to respond to aversive stimuli belie this theory. It is now widely accepted that fish are sentient animals that can experience pain and suffering (see for instance [Marc Bekoff's blog post](#)); thus there is an ethical obligation to treat fish humanely. This has significant impacts for the treatment of fish used for commercial purposes, as well as for fish kept as companion animals and for recreational fishing.

Ornamental fish

More fish are kept as pets than any other companion animal. Pet fish are intelligent, social animals that interact with other fish and often their owners. The average life span of a goldfish provided with proper care is around 10-15 years, though many die sooner due to housing conditions that do not meet their behavioural and physiological needs (see the [RSPCA's guide](#) about caring for goldfish). Thus, there is a strong demand for veterinary expertise in the keeping of ornamental fish (or any aquatic animal) in the areas of husbandry (diet, water quality, maintenance, and space); diagnosing, prescribing medications and treating disease; as well as knowledge about providing environmental enrichment such as hiding places, vegetation, activities, suitable companion species etc. For some suggestions regarding [environmental enrichment](#) for captive fish, see this link to Fish Facts and Fish School, with its accompanying video.

Aquaculture and fish welfare

Fish farming has grown rapidly world-wide over the past 20-30 years. As the population in Australia and around the world grows, so too does the demand for sustainably sourced seafood. Australia's demand for seafood currently exceeds the supply from domestic production and continues to grow. As with any animal production system, productivity and good carcass quality are linked to good standards of welfare. Thus, the growth of the aquaculture industry, which accounts for roughly a quarter of global fish production, has led to an increased need for improving husbandry and management practices of farmed (cultured) fish. Establishing how fish welfare can be measured and supported has become a significant problem, and veterinarians must be aware of the principle welfare considerations relating to farmed fish production in the period leading up to, and at the time of slaughter (Lines & Spence, 2014).

The RSPCA Australia Animal Welfare Science Update provides a good summary of important concepts on [fish welfare in aquaculture](#) (and on recreational fishing) from a special issue on fish behaviour and welfare in the journal of Applied Animal Behaviour Science in late 2006.

Antimicrobial use

Antimicrobial use in aquaculture is also emerging as an important issue due to the impact on public health and the environment (see [this article](#) on antimicrobial use in aquaculture). 'Three-dimensional farming', a limited range of diagnostic equipment and registered medications make disease control in fish challenging. Bacterial diseases in both wild and farmed fish are responsible for heavy mortality in these animals, and antibiotics are commonly used to treat infections therapeutically and prophylactically. Studies exist that show a direct relationship between the use of antibiotics in food animals and the emergence of antibiotic resistance in human/animal pathogens (Teuber, 1999; Van den Bogaard et al., 2002; Cabell et al., 2013) suggesting that the use of antimicrobials in aquaculture be strictly regulated to avoid negative repercussions in people, fish, other animals and the environment. As veterinarians have a general understanding of the biological sciences, interact with animals, industry and the public, and are considered to be respected sources of advice in the community, they are well placed to play an important role concerning this issue.

Recreational fishing

As awareness about fish welfare grows, veterinarians are increasingly being asked about how to euthanise fish caught recreationally. All fish that are caught for eating must be handled carefully to reduce stress and be humanely killed as soon as possible after capture, which also improves the eating qualities of the catch. Allowing a fish to thrash around and die slowly in a bucket of water, ice, or to asphyxiate in the air, is unacceptable. Veterinarians are well placed to educate the public/clients about humane and inhumane methods of killing fish. Humane methods of rapidly killing a fish to maximise its eating qualities and welfare include stunning (instantaneous insensibility) by the Japanese technique of 'Iki jime' (pithing or spiking) or percussive stunning before being bled out by cutting the gill rakers or a main artery (see this link for an explanation of [Iki jime](#) and other humane methods of killing fish). Iki jime involves the insertion of a spike directly into the brain, causing immediate brain death; percussive stunning involves a forceful and accurate blow to the head with a blunt instrument. Resources to show where popular fish species brains are anatomically located are freely available on-line and veterinarians can direct their clients to these resources. The RSPCA provide a guide to [humanely killing fish for eating](#).

Captive marine mammals

The keeping of large marine mammals such as cetaceans, pinnipeds, manatees and polar bears in captivity for public display is controversial. The captive environment bears little resemblance to their wild habitat, and the social groups that these animals are put into are foreign to those found in the wild. Additionally, there have been numerous reports of injury and death caused by captive animals such as orcas to other animals in the environment including humans. There is a strong demand for veterinarians to oversee the health and welfare of animals in public aquaria, and veterinarians need to be aware of the moral and ethical issues that surround the acceptability of keeping large marine mammals in captivity for public display. With the rise of virtual reality technology (see links to [a leaping whale](#) and [a new type of show with orcas and others](#)) it may be possible to replicate (or even enhance) the experience of seeing these animals without requiring their captivity.

Loh and Landos (2011) 'Fish vetting essentials' is a useful reference to help all those involved in caring for fish, and to promote to industry the important role that veterinarians play concerning aquatic animal health.

References cited above

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