

I. EUTHANASIA (CCAC Guidelines for fish)

Guideline 112:

Where feasible, the euthanasia of fishes should consist of a two-step process, with initial anesthesia to the point of loss of equilibrium, followed by a physical or chemical method to cause brain death.

Physical techniques such as percussive stunning and gill-cut methods, commonly used in commercial aquaculture, should be used secondary to anesthesia; the exception being when animals are in extreme distress and the time taken in preparation of anesthesia would result in prolonged distress.

Use of lethal levels of central nervous system depressants, such as buffered TMS, are the preferred method of euthanasia. Alternatively, a stunning blow to the head performed by an experienced person is also acceptable if followed by pithing or cervical dislocation. Use of carbon dioxide is not an acceptable method of euthanasia, nor is suffocation by draining the tank or removing the fish from water. Kreiberg (2000) provides discussion on acceptable methods of euthanasia in fishes. The onus remains on the fish handler to be well informed about the pharmacology and physiological impacts of a proposed method of euthanasia. Robb & Kestin (2002) and Lines *et al.* (2003) provide further information on humane methods of euthanasia for fishes.

Guideline 113:

If a physical technique of euthanasia is used when killing fishes, it should entail the physical destruction of brain tissue by pithing or crushing the brain.

Use of hypothermia (including putting fish on ice) before euthanasia should be avoided. Because many species of fishes continue to have brain activity in the face of advanced cerebral and systemic hypoxia, physical euthanasia techniques such as decapitation alone should be avoided (Flight & Verheijen, 1993). It is therefore desirable to physically destroy, freeze, or pith the brain in fishes that have been euthanised using a primary physical technique such as blow to the head.

The American Veterinary Medical Association (AVMA), in their recommendations on methods of euthanasia for lower vertebrates such as reptiles, no longer support the use of hypothermia/freezing as a technique because of concerns about the induction of pain during ice crystal formation (AVMA, 2001).

Exsanguination under anesthesia is also an acceptable method of euthanasia. Various forms of electrocution have been used commercially, including prolonged exposure to AC and DC voltage; however, these methods may be associated with spinal fractures and muscle damage. When large numbers of fish need to be euthanized, the use of immersion anesthetic at lethal dose in the holding tank is acceptable.