

## **Frequently Asked Questions for *CCAC guidelines on: the care and use of fish in research, teaching and testing***

These Frequently Asked Questions (FAQs) have been developed as a tool to assist investigators and members of animal care committees (ACCs) in the implementation of the *CCAC guidelines on: the care and use of fish in research, teaching and testing*.

The FAQs provide a generic response to the many comments and questions received by the CCAC during the development of the *CCAC guidelines on: the care and use of fish in research, teaching and testing*. Questions were received both as part of the three stages of review of the guidelines, and at workshops held across Canada on the subject of the fish guidelines.

If you do not find the answer to your question here, please contact the CCAC and we will be pleased to provide assistance. These FAQs will be updated regularly and will continue to reflect questions asked by ACCs and investigators in implementation of the *CCAC guidelines on: the care and use of fish in research, teaching and testing*.

- 1. What species are covered by the guidelines?**
- 2. Do the guidelines apply to field research?**
- 3. Does “testing” include lethal testing? Regulatory tests have specified endpoints that may not be in agreement with the endpoints defined by the CCAC.**
- 4. How do the guidelines deal with the wide diversity of fishes involved in research, teaching and testing?**
- 5. What are ‘best practices’ and how can investigators and ACCs be sure that the most appropriate methods are used in the field?**
- 6. Why do some guidelines contain ‘must’ and others contain ‘should’?**
- 7. There is currently a debate in the scientific literature as to whether fish experience pain. How has this been addressed in these guidelines?**
- 8. How are observational activities addressed?**
- 9. What specialized training is required for working with fish? According to the guidelines, won’t fish handlers be required to do more training than those handling other animals used in the laboratory, such as mice and rats?**
- 10. ‘Appropriate training’ is mentioned in the guidelines — is the determination of this left to the discretion of the investigator or the animal care committee?**
- 11. Why are human safety concerns in the guidelines?**
- 12. How can lone scientists working on fish, particularly those working at smaller institutions, comply with these guidelines? Implementation of these guidelines could prove quite costly.**

## **1. What species are covered by the guidelines?**

All bony and cartilaginous fish genera (classes Chondrichthyes [cartilaginous fishes], Agnatha, and Osteichthyes [bony fishes]) are covered by these guidelines. This includes all life stages of these genera, except for fish eggs, embryos or larvae that have not developed beyond exclusive reliance on their own yolk nutrients, which are not covered.

## **2. Do the guidelines apply to field research?**

These guidelines apply to fishes held in facilities for research, teaching and testing, as well as to fishes that are studied in their natural habitat.

## **3. Does “testing” include lethal testing? Regulatory tests have specified endpoints that may not be in agreement with the endpoints defined by the CCAC.**

Currently, protocols or inclusion in animal use inventories is not required for work involving fishes that are lethally sampled under government or other regulatory mandate for established fish inspection procedures, abundance estimates, and other population parameters required for assessing stocks. However, all fishes should be treated humanely whether or not they are to be included in animal use protocols or inventories.

CCAC takes a "moral stewardship" approach to the use of animals in science, as explained in the CCAC Experimental Animal User Training Core Topics - Module 2, Ethics in Animal Experimentation ([www.ccac.ca/en/CCAC\\_Programs/ETCC/Module02E/TableofContentsModule02.htm](http://www.ccac.ca/en/CCAC_Programs/ETCC/Module02E/TableofContentsModule02.htm)). The first guideline statement in the CCAC *guidelines on: institutional animal user training* (CCAC, 1999a) states, "Institutions must strive through their training programs to sustain an institutional culture of respect for animal life".

## **4. How do the guidelines deal with the wide diversity of fishes involved in research, teaching and testing?**

The guidelines acknowledge upfront that the greatest challenges in providing *guidelines on: the care and use of fish* are the wide variety of fishes used in Canada, and the diversity of their habitats, behaviour, life history, and environmental and husbandry requirements. It is also acknowledged that the scientific information required to define the preferred conditions for fish well-being is limited.

The CCAC approach to developing guidelines is to provide the framework for the implementation of best practices, rather than stating the details of best practices, in order to allow for best practices to evolve. This approach also allows for coverage of a large range of species, even in situations where scientific information on preferred conditions for fish well-being is limited. Within the guidelines, where scientific evidence is currently lacking to support the implementation of best practices, efforts have been made to define the most appropriate conditions, based on expert opinion, and approaches to identify those conditions are described.

CCAC will provide links to additional information concerning best practices as it becomes available, and encourages institutions to submit best practice information to CCAC for peer-review and publication on the CCAC website. As well, CCAC has

identified particular research needs associated with the implementation of these guidelines and has communicated this to the federal granting agencies.

#### **5. What are 'best practices' and how can investigators and ACCs be sure that the most appropriate methods are used in the field?**

In the context of fish research, the term 'best practices' refers to procedures which minimize pain and/or distress for the animal in the short term, and which cause the least impediment to the normal behaviour of the animal and its long-term survival. The procedures used may vary, depending on a number of factors including local environment and climate conditions. In order to assist in dissemination of best practices (often not published in the literature), the CCAC encourages investigators and ACCs to submit information on new or improved procedures to the Guidelines Program. (hot link Guidelines Program to Julie's e-mail) Information received in this manner will undergo peer review, and will be included in the species-specific recommendations posted on the CCAC website for use in conjunction with the *CCAC guidelines on: the care and use of fish in research, teaching and testing*.

#### **6. Why do some guidelines contain 'must' and others contain 'should'?**

The word 'must' is used where regulatory requirements are involved or where it is absolutely imperative to adhere to a particular guideline. 'Should' indicates where a guideline describes best practice and is to be followed unless justification for doing otherwise has been presented and found acceptable by an animal care committee.

#### **7. There is currently a debate in the scientific literature as to whether fish experience pain. How has this been addressed in these guidelines?**

The guidelines explicitly recognize that the capacity of fish to experience any of the adverse states usually associated with pain in mammals is subject to a great deal of debate in the scientific literature (FAWC, 1996; FSBI, 2002; Rose, 2002; Braithwaite & Huntingford, 2004), but also state that the capacity of fishes to perceive noxious stimuli must also be recognized. Noxious stimuli are those stimuli that are damaging or potentially damaging to normal tissue (e.g., mechanical pressure, extremes of temperature and corrosive chemicals). Fishes are capable of behavioural, physiological and hormonal responses to stressors (including noxious stimuli) which can be detrimental to their well-being.

With this debate in mind, the guidelines include a working definition of pain in fish: fish pain is a response to a noxious stimulus that results in a change in behaviour or physiology and the same noxious stimulus would be painful to humans.

#### **References:**

- Braithwaite V.A. & Huntingford F.A. (2004) Fish and Welfare: Do Fish Have the Capacity for Pain Perception and Suffering? *Animal Welfare* 13:S87-S92
- Farm Animal Welfare Council (FAWC) (1996). Report on the Welfare of Farmed Fish. UK: FAWC. Available at <http://www.fawc.org.uk/reports/fish/fishrtoc.htm>
- Fisheries Society of the British Isles (FSBI) (2002) Fish Welfare. Electronic document, <http://www.le.ac.uk/biology/fsbi/welfare.pdf>

Rose J.D. (2002) The Neurobehavioral Nature of Fishes and the Question of Awareness of Pain. *Reviews in Fishery Science* 10(1):1-38.

## **8. How are observational activities addressed?**

CCAC operates a precautionary approach when considering categorization of protocols, based on the potential for pain and/or distress. Observational studies would in general be categorized as Category A level of invasiveness, provided that there is no disturbance of the animals. The CCAC does not require animal care committees to review protocols of a purely observational nature. Nonetheless, it is in the institution's best interest to ensure that it is aware of all animal based studies, in order that it can answer any questions that may arise as a result of the studies.

Animal Care Committees are expected to use their best judgements, based on common sense and previous experience with similar studies, to determine the level of disturbance likely to occur and to ensure that the investigator has assigned the protocol to the appropriate level of invasiveness.

The CCAC publishes numbers of animals used in the various categories of invasiveness, based on a precautionary approach, on an annual basis. Investigators and animal care committees are required to assign categories based on the potential level of pain and distress. When the numbers are published and presented, this is explained in order that the various communities understand the context in which the numbers are reported.

## **9. What specialized training is required for working with fish? According to the guidelines, won't fish handlers be required to do more training than those handling other animals used in the laboratory, such as mice and rats?**

The guidelines state, "Before working with fishes, investigators, technical staff and post-graduate students must be properly trained and have their competency evaluated". This is similar to the level of training required for working with other animals in a research setting, and is based on the *CCAC guidelines on: institutional animal user training* (CCAC, 1999) and the Core Components of the *Recommended Syllabus for an Institutional Animal User Training Program* (CCAC, 1999b). The CCAC website ([www.ccac.ca/en/CCAC\\_Programs/CCAC\\_Programs-ETC.htm](http://www.ccac.ca/en/CCAC_Programs/CCAC_Programs-ETC.htm)) offers further information on relevant courses for investigators using fish as a research animal.

## **10. 'Appropriate training' is mentioned in the guidelines — is the determination of this left to the discretion of the investigator or the animal care committee?**

Ultimately, it is the responsibility of the animal care committee to ensure that animal users have the necessary training and experience to perform the procedures described in the protocol. In addition, the animal care committee is responsible for ensuring that the investigator has made provision for adequate physical and personnel resources to be available for the duration of the study.

### **11. Why are human safety concerns in the guidelines?**

A section on human safety considerations has been added as animal care committees are responsible for ensuring that there has been institutional approval for the use of biohazardous, infectious, biological, chemical or radioactive agents (*CCAC policy statement on: terms of reference for animal care committees*, 2000) and that institutions are aware of the hazards to which their personnel may be exposed.

### **12. How can lone scientists working on fish, particularly those working at smaller institutions, comply with these guidelines? Implementation of these guidelines could prove quite costly.**

The CCAC approach to developing guidelines is to provide the framework for the implementation of best practices, rather than stating the details of best practices. In this way, the guidelines may be applied to facilities of different sizes. For example in the section on Environmental Control and Monitoring, one of the guidelines state, “An environmental monitoring system is essential for aquatic facilities and should be designed to suit the water management system.” In the text following this guideline it states:

*Many facilities have simple systems where unexpected environmental changes are unlikely to occur. These facilities should not need to establish costly water monitoring systems for a rare event, and in these situations monitoring through regular visits by custodial staff is usually sufficient .... Large sophisticated systems, however, will require extensive, generally computer-based, monitor and control systems with redundant and fail-safe modes and automated emergency contact systems....*