

Animals in Scientific Studies at Cefas

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Introduction

Cefas is a government agency of Defra. We seek to be the prime source of world-class science used by the UK government and others to make a real difference in securing healthy marine and freshwater environments for everyone's wellbeing, health and prosperity. We promote rational management of natural resources and seek to protect the public from aquatic contaminants. We monitor and support sustainable aquaculture and we identify and investigate fish diseases. This is achieved by providing evidence-based scientific advice, managing related data and information, conducting world-class scientific research, and facilitating collaborative action through wide-ranging international relationships.

Cefas has about 600 staff primarily based at two laboratories in Lowestoft (Suffolk) and Weymouth (Dorset). We also have an ocean-going research vessel that allows us to carry out work at sea. Cefas carries out a wide range of science relating to the status of the marine and freshwater environments, and the animals that inhabit them, to underpin our ability to provide advice. We are responsible for providing scientific advice, both nationally and internationally, on:

- the state of commercial fish stocks in UK waters;
- the quality of the environment in which they live; and
- the health of farmed and wild fish.

Our work, and why we use animals

Much of the work undertaken by Cefas does not involve the use of live animals directly. However, given the current state of scientific understanding, the use of animals is sometimes necessary to ensure that our science is based on sound evidence. Some of these studies are required to fulfil our statutory obligations (e.g. in the area of food safety); some we have to do to ensure that the quality advice we give is accurate and justified; and some we do because we believe it is necessary to provide an accurate understanding of the science that underpins the advice we give.

Cefas recognises that studies involving animals may cause them discomfort or distress. We respect animals and recognise and acknowledge the views of people who are concerned about, or have a moral objection to the use of animals in experiments. Cefas believes that the studies it undertakes involving living animals are justified and necessary. We also recognise our duty to limit the number of animals we use, minimise their distress and improve their welfare. We take this very seriously. Cefas understands that even if unavoidable, causing pain or distress cannot be viewed as a matter of moral indifference and that critical evaluation and justification of animal use, on a case-by-case basis, is called for.

In this document we aim to explain more fully:

- the nature of the monitoring and experimental work involving animals that we carry out;
- why we use animals and what the animals experience;
- how pain and distress are prevented or minimised; and
- the systems and management structures we have in place to ensure that animal use is both legal and ethical.

We believe that animals are important in their own right. However, in many situations they are the only reliable source of information that can help us protect wild and farmed fish, public health and the overall environment. Nonetheless we appreciate that animals, including fish, can probably experience pain and we are committed morally to justifying all animal experiments and minimising any distress that may occur.

In keeping with Cefas' mission to support the Blue Growth and Food Security agenda all data collected from protected animal studies at Cefas are intended to protect, minimise or prevent greater harm to farmed or wild animals.

Commercial fish stocks

Cefas is responsible for gathering the scientific information on the status of UK fish and shellfish stocks that underpins advice on fisheries management. This involves collecting information about commercial landings of fish. Alone this is insufficient to estimate or 'assess' the structure (composition by sex, age and size) of the existing stocks accurately. We therefore carry out some 10 to 15 independent survey cruises around the UK each year to assess the abundance and population structure for more than 50 commercial fish stocks. Using standard survey fishing techniques these cruises are conducted from either our own research vessels or from commercial fishing boats specifically chartered for the purpose.

To minimise the need for fishing surveys we also gather data from commercial catches and apply egg-based stock assessment methods where appropriate. All of the fisheries assessment work is carried out within an international framework to share knowledge and reduce sampling. We also carry out the science necessary to assess the impact of human activities and natural factors on marine and freshwater animals and ecosystems. This involves a range of research programmes aimed at understanding the movements, behaviour and population dynamics of fish populations, and the effects of human activities and natural processes on aquatic ecosystems. This includes investigations into life history stages from planktonic eggs and larvae to adults.

Studies are carried out that involve tagging wild fish with electronic tags in order to understand their movements and behaviour in relation to the environment and management measures. For this

work, fish are caught and restrained. Tags are then either attached externally to the fish, or implanted in the gut cavity. External tagging is likely to cause stress and momentary pain but the procedure is very quick and fish are rapidly released back into the environment. For internal tagging, fish are anaesthetised for the few moments it takes to insert the tag. The fish are carefully checked as they recover from the anaesthetic before they are released back to the water. In both cases we ensure that staff are trained and competent to undertake the tagging process and identify, mitigate and manage any distress observed in tagged animals. Where previously anaesthetised fish are to be released to the wild, we ensure we comply with all national legislation.

Quality of the environment

The way modern societies live and work causes a large number of chemicals to enter the aquatic environment by a number of different routes. Cefas is responsible for carrying out work in relation to the conservation of ecosystems and surveillance of human and natural disturbance of the aquatic environment, particularly the effects of hazardous substances. This requires experimental work, exposing cell cultures, plants or sometimes animals to varying concentrations of pollutant chemicals within a controlled laboratory setting. The majority of testing work is carried out using invertebrates, but sometimes fish must be used to answer specific questions or to comply with particular regulations.

We conduct tests looking at the effects of veterinary medicines, biocides, oil pollution, production chemicals and dispersants on aquatic animals to aid control of the potentially damaging materials within the environment. Some chemicals at environmental levels can modify physiological processes and inhibit growth, so we design and conduct experiments to measure these long-term effects. The decision to use fish and the methodology we use follows international guidelines and is constantly under review, nationally, internationally and within Cefas.

When investigating possible environmental effects, fish at the appropriate stage in their life history are exposed to chemicals at levels similar to those found in the environment. Our research includes life-cycle modelling of the impacts of these chemicals at the population level. In the majority of this work the fish are intensively monitored during the experiment and humanely killed at the end. Cefas is committed to implementing humane endpoints in all animal studies and we work to both the definition and spirit of the 3Rs (Reduction, Refinement and Replacement of animals in experimentation, Russell and Burch 1959).

We strive to reduce the use of fish by replacing them with invertebrates or cell lines grown in culture where possible, and to increase the use of sub-lethal testing techniques that cause less distress. In

situations where there is currently no alternative to using live fish we endeavour to improve experimental designs and statistical analysis to reduce the number of animals required. Our work involving fish and shellfish is carried out to meet mandatory requirements under national, European and international regulations and inform monitoring programmes associated with the protection of the marine environment. The main purpose is to protect aquatic life from the adverse effects of pollutants whatever their origin.

The health of farmed and wild fish

Cefas is responsible for providing scientific advice and services related to the development of sustainable aquaculture practices and the protection of wild and cultivated fish stocks from disease. One aspect of the work is the study of fish diseases (understanding the biology of a disease, its infectivity, which species are affected etc.) and the evaluation of possible vaccines, treatments or cures. Our aim is to minimise the impact of disease on both wild and cultivated fish.

We have input from expert statisticians to ensure that we use the minimum number of fish necessary and their welfare is routinely monitored by cameras and visual inspection. In addition, we investigate factors affecting fish on fish farms to identify indicators of positive and negative welfare in order to make recommendations for improving aquaculture practices.

Systems we use to make sure our work is legal and ethical

All work carried out for a scientific purpose involving the use of vertebrate animals and cephalopods, (squid, octopus and cuttlefish) is regulated in the UK by the Home Office under the **Animals (Scientific Procedures) Act 1986 Amended Regulations 2012** usually referred to as ASPA. Cefas places great importance on ensuring full compliance with ASPA in everything that we do. ASPA requires that both our laboratories are licensed under an **Establishment Licence** and that individual scientists and programmes of work are approved through a system of **personal** and **project licences**. Each laboratory has a designated **Establishment Licence Holder** who is a senior member of staff with ultimate responsibility for ensuring that the standards of care and accommodation fulfil the Home Office Codes of Practice and that everything we do complies with the requirements of ASPA. At Cefas, the Establishment Licence Holders at the Weymouth and Lowestoft laboratories are also the **Named Compliance Officer (NCO)**. Each laboratory has a group of trained staff directly involved with animal care. These include **Named Animal Care and Welfare Officers (NACWOs)**, **Named Veterinary Surgeons (NVS)** specialising in aquatic animals, and day-to-day care persons. Other

persons specifically identified in the Establishment Licence are the **Named Training and Competency Officers (NTCOs)** who ensure that all staff engaged in work covered by ASPA are properly trained. In addition, the **Named Information Officers (NIOs)** ensure that all staff engaged in work covered by ASPA have access to the information they require when planning animal studies or attending to the welfare needs of the animals.

Some activities involving fish (principally the fishing surveys required to assess the status of commercial fish stocks) are regarded by the Home Office as routine husbandry practices and are not normally regulated under the ASPA. Similarly, any work conducted at sea beyond the 12-mile limit of territorial waters, or in another country, is not regulated ASPA. Nonetheless, in any such work we still seek to apply the same stringent animal welfare and ethical principles that we apply to our regulated work and will comply with all applicable legal requirements (e.g. Animal Welfare Act 2006).

Occasionally, we work with non-Cefas personnel to help us achieve our scientific aims. In these situations, we strive to ensure that non-Cefas personnel have the appropriate authority and training to comply with ASPA and that they adhere to our standard welfare and ethical procedures and practices.

Animal Welfare and Ethical Review Body (AWERB)

ASPA requires each establishment to have in place an approved, well documented ethical review process that helps to promote a 'culture of care'. This process is managed by the Animal Welfare and Ethical Review Body (AWERB) whose principle roles include reviewing animal welfare and use, ensuring that the 3Rs are fully implemented throughout the establishment and to consider and approve project licence applications prior to submission to the Home Office. Cefas, involves lay members (who are not directly associated with animal studies) in this process to widen the discussion about the justification and necessity of animal use.

The geographical locations of our laboratories, and differences in the work conducted at each site, requires Cefas to maintain two Animal Welfare and Ethical Review Bodies; one at Lowestoft and one at Weymouth. Both AWERBs are based on a committee structure and have been approved by the Home Office. Cefas ethical review processes are intended to be local frameworks that help ensure:

- full and effective implementation of the ASPA;
- fostering an environment where the ethical justification for work can be discussed; and

- fostering a culture; where the welfare of animals in our charge is paramount.

The two local AWERBs within Cefas aim to ensure compliance with the requirements of ASPA, and to promote a 'culture of care' for animals throughout the agency. Each Committee meets at least twice annually, with the following remit:

- to review applications for project licences, and make recommendations to the Establishment Licence Holder for the relevant site;
- to oversee and review the care and accommodation standards applied to animals at Cefas' laboratories, and promote best practice;
- to identify training needs;
- to check that appropriate expertise is available and being used in the design of experiments and other work involving animals;
- to foster awareness of animal welfare issues, through active dissemination of information to the agency's staff, and by providing a forum in which concerns can be discussed; and
- to advise the Establishment Licence Holders on issues requiring local management action.

Membership of each AWERB includes the person designated to liaise with the Home Office (this person usually chairs the Committee); Named Veterinary Surgeons (NVS); Named Animal Care and Welfare Officers (NACWOs); Named Information Officers (NIOs), Named Training and Competency Officers (NTCOs), representative project and personal licence holders; and both internal and external lay members. The external lay members are from the local community and are not associated with the work of the laboratory. Members also include professionals involved in animal care and welfare. The external representation provides an independent ethical view of our work. The relevant Home Officer inspector has an open invitation to attend committee meetings.

In assessing proposed programs of work, our ethical review processes pay particular attention to:

- predicting and 'balancing' harms and benefits;
- the justification for individual research projects;
- the use of wild-caught animals;
- refining experimental procedures;
- improving housing, husbandry and care, including environmental enrichment and group housing;
- scope for replacing experiments with humane alternatives or, where this is not currently possible, refining procedures and husbandry and reducing numbers (the 3Rs);
- re- homing or releasing animals; and
- dissemination of scientific results and techniques for applying the 3Rs to the scientific community and the public.

Because we have two separate laboratories, each with their own Establishment Licence and AWERB, Cefas also has an established Pan-Cefas AWERB to provide a forum for debate among members of the two local AWERBs. It enables the responsibilities of the Establishment Licence Holders at each laboratory to be aligned with the overall accountability of the Chief Executive for all the work conducted in the agency.

This Body is chaired by Cefas Chief Scientist. Other members include the chairs of the two local AWERBs, Establishment Licence Holders for the two laboratories and other members of the local AWERBs as appropriate. The Pan-Cefas AWERB meets annually, with the following remit:

- to consider common issues requiring a co-ordinated approach across Cefas;
- to identify areas of divergent practice that require harmonisation;
- to agree policies relating to the use of animals, for parallel implementation by the local AWERBs and Establishment Licence Holders; and
- to advise the Chief Executive on matters requiring Cefas Executive Committee (CEC) action.

All meetings are minuted and the Pan-Cefas AWERB reports to CEC annually.

In addition to the improvement of animal care and welfare practices at an establishment/organisational level, the local AWERBs also contribute to separate regional "AWERB Hubs" aimed at facilitating communication between different establishments. These regional hubs support the Animals in Science Committee's aim to share best practice on matters relating to animal acquisition, breeding, accommodation and care at a national level as well as promoting the 3Rs.

How we minimise pain and distress

When planning a programme of work, our AWERBs carefully consider any potential adverse effects the work may have on the animals involved and how these can be minimised or avoided. We take care when housing, handling and caring for animals to ensure that they are kept in an appropriate environment and treated with respect. Anaesthetics and analgesics are used wherever appropriate and humane endpoints applied to individuals if they show signs of distress.

At a practical level, trained staff monitor the health and welfare of the animals in our charge on a daily basis, including weekends and public holidays. We take into account the whole lifetime experience of each animal, from birth to death, as well as the numbers of animals used. Cefas is committed to applying the 3Rs and continually strives to avoid the use of live vertebrate animals wherever possible. Where the use of animals is necessary, we take every step to ensure that the numbers used are kept as low as possible and that methods are refined to minimise or eliminate all potential sources of distress. In addition, we seek to maximise the application of the knowledge that

we obtain by publishing our findings so that others may share what we have learned. All of these measures benefit not only animal welfare but also the quality of our science, since applying the 3Rs results in better quality data.

Animal Welfare Policy

Alongside the legal requirements for animal care and welfare enshrined in the Animals (Scientific Procedures) Act, Cefas has an established Animal Welfare Policy stating that we will:

- adopt a humane and compassionate approach to the animals in our care;
- maintain an active, well-documented ethical review process;
- comply fully with the provisions of the ASPA and all aspects of associated Codes of Practice;
- seek continually to improve standards of animal care by fostering an open culture in which all staff have access to our animal welfare review processes;
- ensure that all uses of animals are carefully considered and justified, and that proper account is taken of the 3Rs of reduction, refinement and replacement;
- ensure that staff involved in the care and use of animals are competent and adequately trained;
- foster an awareness of animal welfare issues throughout the agency;
- fulfil our Commitments as signatories of the Concordat on Openness on Animal Research in the UK; and,
- ensure that all staff involved with work under ASPA have a readily accessible means of raising 'causes of concern' with Cefas management.

Further information about the ASPA can be found at the Home Office's website:

<https://www.gov.uk/guidance/research-and-testing-using-animals>

We hope we have answered most of your questions. However, should you like further information, or if you wish to discuss specific issues, please contact us through our website at

<https://www.cefas.co.uk>



About us

We are the Government's marine and freshwater science experts. We help keep our seas, oceans and rivers healthy and productive and our seafood safe and sustainable by providing data and advice to the UK Government and our overseas partners.

We are passionate about what we do because our work helps tackle the serious global problems of climate change, marine litter, over-fishing and pollution in support of the UK's commitments to a better future (for example the UN Sustainable Development Goals and Defra's 25 year Environment Plan).

We work in partnership with our colleagues in Defra and across UK government, and with international governments, business, maritime and fishing industry, non-governmental organisations, research institutes, universities, civil society and schools to collate and share knowledge.

Together we can understand and value our seas to secure a sustainable blue future for us all, and help create a greater place for living.

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Innovative, world-class science is central to our mission. Our scientists use a breadth of surveying, mapping and sampling technologies to collect and analyse data that are reliable and valuable. We use our state-of-the-art Research Vessel Cefas Endeavour, autonomous marine vehicles, remotely piloted aircraft and utilise satellites to monitor and assess the health of our waters.

In our laboratories in Lowestoft and Weymouth we:

- safeguard human and animal health
- enable food security
- support marine economies.

This is supported by monitoring risks and disease in water and seafood; using our data in advanced computer models to advise on how best to manage fish stocks and seafood farming; to reduce the environmental impact of man-made developments; and to respond to serious emergencies such as fish disease outbreaks, and to respond to oil or chemical spills, and radioactivity leaks.

Overseas, our scientists currently work in Commonwealth countries, United Kingdom Overseas Territories, South East Asia and the Middle East.

Our customer base and partnerships are broad, spanning Government, public and private sectors, academia, non-governmental organisations (NGOs), at home and internationally.



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