

ANIMALS have friends

and those friends have

VOTES!



ELECTION 2015 BRIEFING: CRUSTACEANS AND CEPHALOPODS

CAMPAIGN AIM

AN EXTENSION OF THE ANIMAL WELFARE ACT TO INCLUDE
CRUSTACEANS AND CEPHALOPODS

BACKGROUND

• Currently, the Animal Welfare Act excludes cephalopods (octopus, squid, cuttlefish and nautilus) and decapod crustaceans (lobster, crab, crayfish, prawns and shrimps).

• There is an ample – and growing – body of research that indicates both cephalopods and decapod crustaceans experience pain.

• Cephalopods are already protected in all European research laboratories as, according to Directive 2010/63, 'there is scientific evidence of their ability to experience pain, suffering, distress and lasting harm'.

• The Animal Welfare Act 2006 states that its protection can be extended to include invertebrates if 'the appropriate national authority is satisfied, on the basis of scientific evidence, that animals of the kind concerned are capable of experiencing pain or suffering'.

SUFFERING

• Catching, trapping, handling, holding, storing, keeping, displaying and killing can cause stress, injury, and suffering to decapod crustaceans and cephalopods. During these processes they may suffer infections, open wounds and other lesions. They may die from starvation, dehydration, overheating, or from injuries sustained from fighting whilst in unattended storage pots or lost traps.

• Storage and killing in restaurants, and in retail and domestic environments, are not yet regulated. The current practice of killing lobsters by cooking them alive in boiling water without the use of anaesthesia or pre-stunning is of particular concern. The animals

struggle violently, even shedding their limbs or tearing at their own bodies with their claws. It is no longer safe to assume that this behaviour is reflex and involves no pain.

• Eyestalk ablation in prawns and shrimps – the removal of the eyestalk, which triggers the maturing of the ovaries – is commonplace when farming them, but is recognised by scientists to be both controversial and cruel.

CAPABLE OF EXPERIENCING PAIN?

• There is plentiful evidence that crustaceans are capable of experiencing pain, which is a requirement for a regulation to be made under the Animal Welfare Act. There is also evidence that they do, indeed, experience pain – a higher test than is required for them to be granted legal protection.

• Since pain and suffering are private, internal, subjective experiences, they are difficult to prove *beyond doubt* even in animals who are currently covered by the Animal Welfare Act or; indeed, in humans other than ourselves. Scientists, therefore, seek to determine that the animals are capable of feeling pain because they:

- have nervous systems and related physiological and neurochemical mechanisms
- behave in a way that indicates that they do feel pain (for example through avoidance or escape)
- have the mental capacity to learn from, remember and respond to noxious stimuli.

Physiological Mechanisms in Decapod Crustaceans

• Decapod crustaceans have a complex nervous system consisting of nerve cords that connect ganglia – concentrations of



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nerve cells that are almost like small brains, and which function as centres for the reception of sensory inputs.

- They have a large number of receptor cells for detecting chemical and mechanical inputs.
- Crustaceans have the sensory receptors – nociceptors – necessary to respond to aversive or noxious stimuli, and these send signals to the largest ganglia, which functions as a brain.
- Decapod crustaceans have very similar physiological and neurochemical responses to stimuli that would be expected to cause pain to vertebrates. For example, opioid peptides have been found in decapod crustaceans, and appear to have a similar role as in vertebrates, strongly suggesting that they mediate pain in the same way.

Behavioural Indications that Crustaceans Feel Pain and Remember it

- Various studies from as far back as the 1980s have found that crabs exhibit a defensive reaction to electric shocks, and that this reaction can be reduced by administering morphine.
- More recently, Professor Robert Elwood from Queen's University School of Biological Sciences has conducted a series of studies. He found that glass prawns groomed their antennae when a noxious substance was applied and groomed less when a local anaesthetic was administered (2007); hermit crabs not only suffer pain but retain a memory of it (2009); after administering electric shocks to common shore crabs they 'were willing to give up their hideaway in order to avoid the source of their probable pain' (2013).

Physiological Mechanisms in Cephalopods

- Cephalopods possess a well-developed nervous system and the most complex brain of any invertebrate. Certain upper lobes within the brain serve as controls for memory and learning.
- The European Food Safety Authority (EFSA), a body that provides independent scientific advice on food safety risks to the European Commission, considered cephalopods in a 2005 report: 'There is evidence that cephalopods have a nervous system and relatively complex brain similar to many vertebrates, and sufficient in structure and functioning for them to experience pain. Notably, they release adrenal hormones in response to situations that would elicit pain and distress in humans.'
- They have numerous complex sensory organs, including good eyesight and an excellent sense of touch, and they can use both of these senses to make fine discriminations between objects. Aspects of their brain functioning have been found to be similar to that of vertebrates.
- A 2013 study reported in *The Journal of Neuroscience* found that squid possess nociceptors and show both short- and long-term sensitisation after injury to the body. A 2013 article in *Scientific American* stated that it is also 'likely that, based on behavioural studies, octopuses have nociceptors.'

Behavioural Indications that Cephalopods Feel Pain

- In 2014, evolutionary neurobiologist Robyn Crook and

colleagues at the University of Texas Health Science Center found that octopuses show much of the pain-related behavior seen in vertebrates, such as grooming and protecting an injured body part.

- Electric shocks have been used in experiments to train octopuses to discriminate between objects (and they show signs of fear when subjected to such shocks).
- Cuttlefish quickly learn not to attack 'prey' enclosed in a glass tube, and scientists concluded this may be due to the pain felt when hitting the glass.

EFSA RECOMMENDS PROTECTING DECAPOD CRUSTACEANS AND CEPHALOPODS

- EFSA considered the evidence and concluded in 2005 'that... all Cephalopoda and decapod crustaceans fall into the same category of animals as those that are at present protected'.
- It recommended that all decapod crustaceans and cephalopods should be in Category 1 where 'the scientific evidence clearly indicates that those groups of animals are able to experience pain and distress, or the evidence, either directly or by analogy with animals in the same taxonomic group(s), are able to experience pain and distress'.

PROTECTION OVERSEAS

- In Norway, the Animal Welfare Act applies to crustaceans.
- In Switzerland, the Animal Welfare Ordinance extends protection to cephalopods and crustaceans.
- Some Australian states have extended protection to cephalopods and crustaceans.
- The New Zealand Animal Welfare Act of 1999 includes octopus, squid, crab, lobsters and crayfish.

ACCEPTANCE OF PAIN IN CEPHALOPODS IN ANIMAL RESEARCH DIRECTIVE

- There is already an acceptance in both UK and EU law that cephalopods feel pain.
- The common octopus was brought under the Animals (Scientific Procedures) Act in 1993.
- From January 2013, scientific projects involving any cephalopod became regulated by Directive 2010/63/EU. The Directive states: 'there is scientific evidence of their ability to experience pain, suffering, distress and lasting harm'.

THRESHOLD OF PROOF REACHED?

- We believe that the case for decapod crustaceans and cephalopods being both capable of feeling pain and actually experiencing pain is convincing. Even if the law demanded that the latter higher bar was reached, we would urge the authorities to take a precautionary approach and amend the Animal Welfare Act to include them on the balance of evidence.

All references are available on request.