

Fish welfare

Prof Edmund Peeler



Centre for Environment,
Fisheries & Aquaculture
Science



Cefas

We are Cefas

Cefas is the **C**entre for **E**nvironment, **F**isheries, and **A**quaculture **S**cience.

We are an Executive Agency of Defra, the UK government's Department of Environment, Food and Rural Affairs.

We employ specialists across the aquatic sciences: from aquatic animal health to aquaculture, blue carbon to biological effects monitoring, fisheries to future energy.



What is animal welfare?

definitions

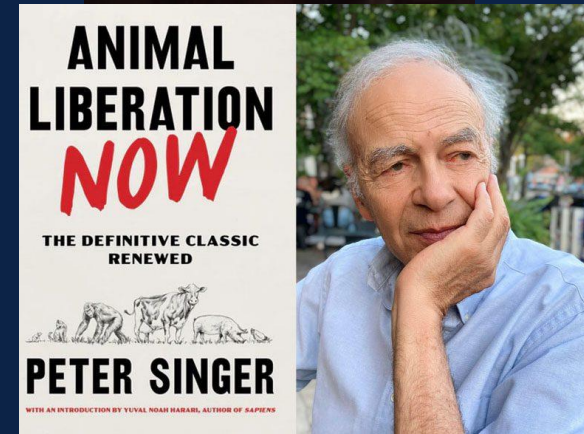
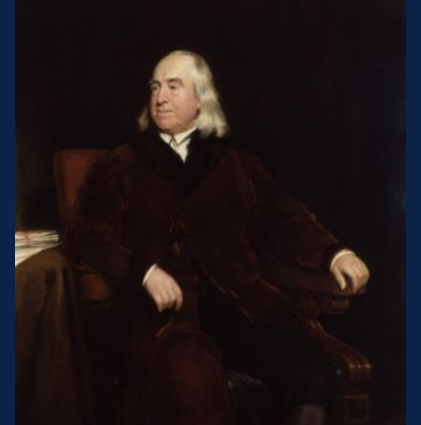
- Animal welfare refers to the physical and mental wellbeing of an animal, encompassing all aspects of their quality of life, particularly when under human care or captivity
- Broom (1986) defined welfare of an animal
 - As '*...its state as regards its attempt to cope with its environment*'.
 - Failure to cope results in adverse physical (e.g. trauma) or mental (e.g. stress) outcomes, and poor welfare.

A short history of animal welfare

"The question is not, Can they *reason*? nor, Can they *talk*? but, Can they *suffer*?" (Bentham, 1789)

- Descartes in the 17th century who argued that animals do not experience pain and suffering because they **lack consciousness**
- Bentham (1789) was the first thinker to argue that the **capacity to suffer** was morally important irrespective of species
- Singer (1990) argued that sentience should determine whether species are included within the 'moral circle' and, therefore, humans have **responsibility to balance the burden and benefit of their treatment**

A "moral circle" refers to the boundaries of our moral consideration and concern for others, including humans and non-human entities.



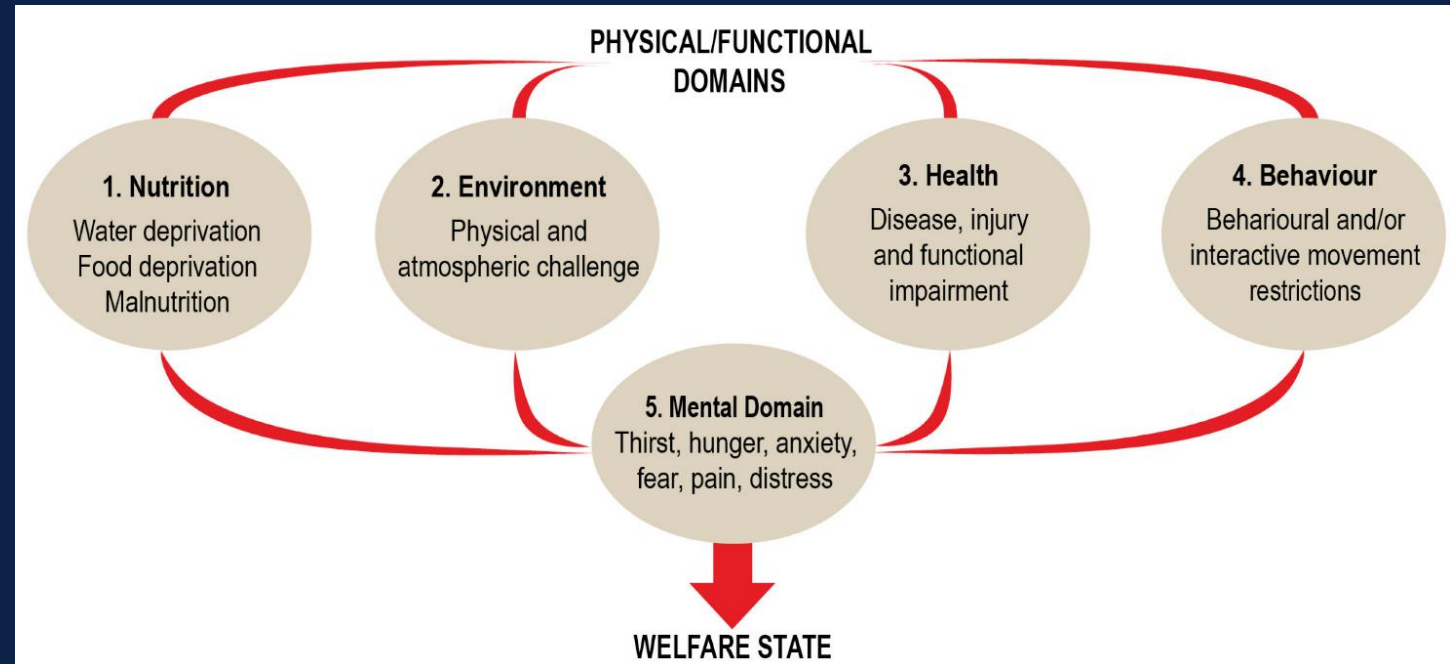
Models of animal welfare

Freedoms and Domains

The five freedoms

1. Freedom from thirst, hunger and malnutrition
2. Freedom from discomfort and exposure
3. Freedom from pain, injury, and disease
4. Freedom from fear and distress
5. Freedom to express normal behaviour

The Five Domains model (from Mellor and Reid, 1994)



Is it different for fish?

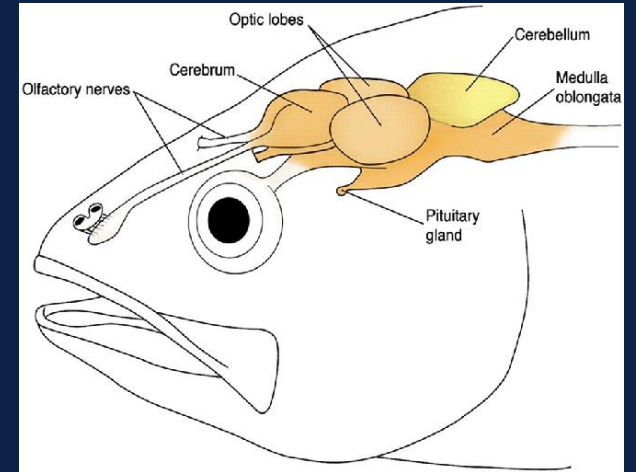
- The European Food Standards Authority (2009) concluded that the concept of animal welfare is the same for all animals, i.e. mammals, birds and fish
- Fish welfare of fish has been less studied than the welfare of mammals or birds
- Standards and guidelines to protect fish welfare has lagged behind those for other vertebrate species
- The **sentience** of fish remains a subject of dispute

Sentience

Sentience is the capacity to feel, perceive, and have subjective experiences, such as pain

Sentience is:

- fundamental to a discussion of a fish's capacity to experience pain, fear or stress
- a pre-requisite for an animal species to have a welfare status
- inferred by examination of both the cognitive abilities and neuroanatomical features



Fish sentience: current state of play

Do fish feel pain?

- Fish experience not only nociception (and nocifensive withdrawal) but also the negative affective component of pain
- Behavioural and neurophysiological studies of several bony fish species demonstrate that responses, behavioural avoidance and learning from experience of tissue damage occur in a similar way in fish and mammals.
- Consensus that fish fulfil the criteria for sentience and have the potential for pain perception

Fish sentience: current state of play

Can fish experience stress and fear?

- The neurobehavioural similarities between fish and other vertebrates supports the hypothesis that fish have capacity to experience psychological stress



Uncertainty

It cannot be proven or disproven that fish subjectively experience pain

Benefit of doubt position:

- Considerable evidence exists to support hypothesis that fish experience pain
- A lack of complete certainty should not be used to prevent potentially serious negative welfare outcomes

Sceptical position:

- Fish have not met sufficient criteria to conclude they are sentient
- Recognising fish sentience would have negative financial costs to the fish farming industry and other sectors

Potential welfare hazards

Aquaculture practices frequently expose fish to a range of potential stressors

- Harvesting
- Handling / crowding / grading
- Loading / transportation
- Vaccination / treatments



Current WOAH standards

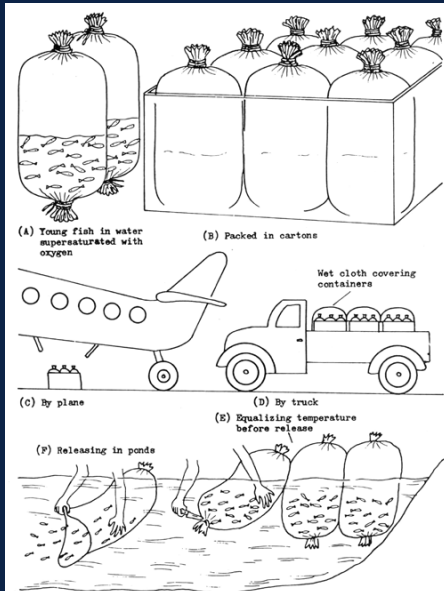
Section 7

7.1 Introduction to recommendations for welfare of farmed fish

7.2 Welfare of farmed fish during transport

7.3 Welfare aspects of stunning and killing of farmed fish for human consumption

7.4 Killing of farmed fish for disease control purposes

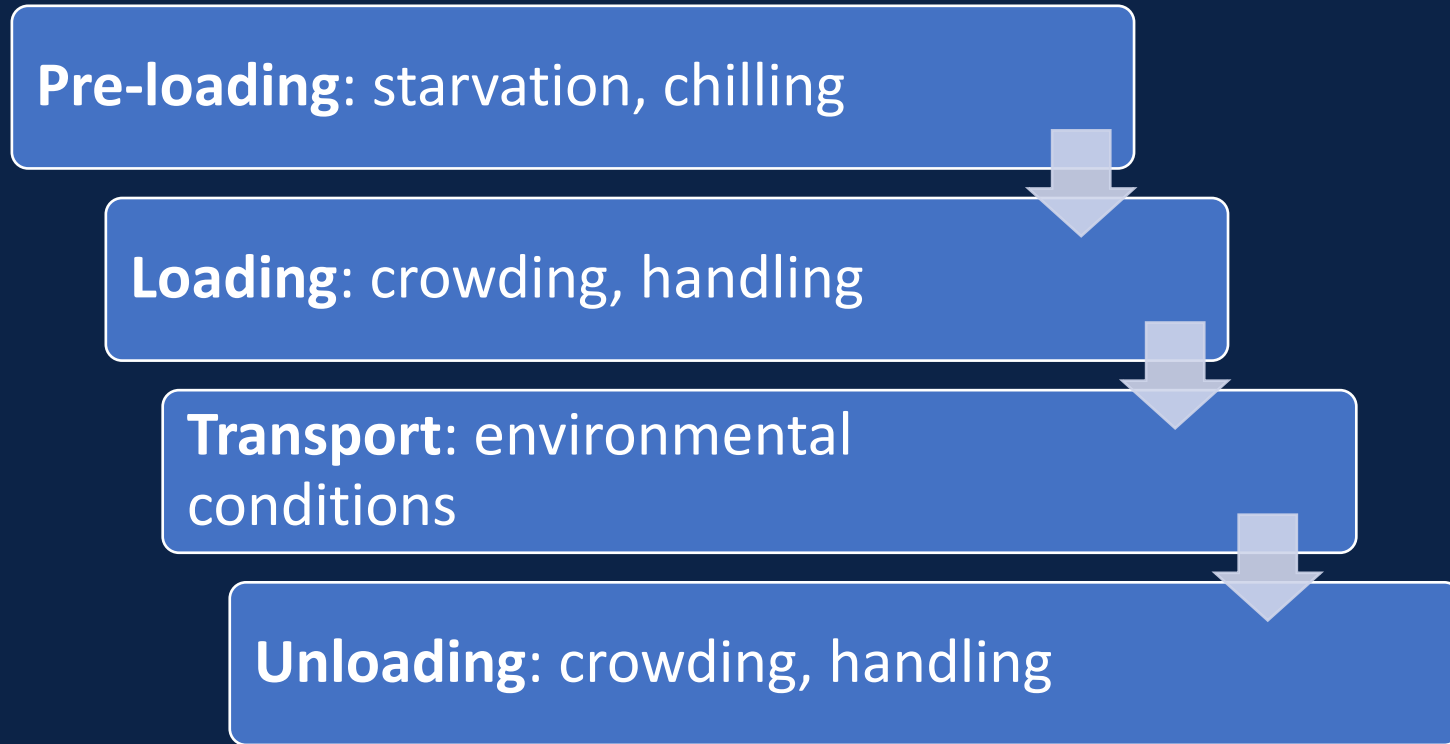


Introduction to recommendations (7.1)

Principles

- The use of fish carries with it an **ethical responsibility to ensure the welfare** of such animals to the greatest extent practicable
- The scientific assessment of fish welfare involves both **scientifically derived data** and **value-based assumptions**
- WOAH recommendations....address the welfare of farmed fish at a general level.

Welfare during transport (7.2)

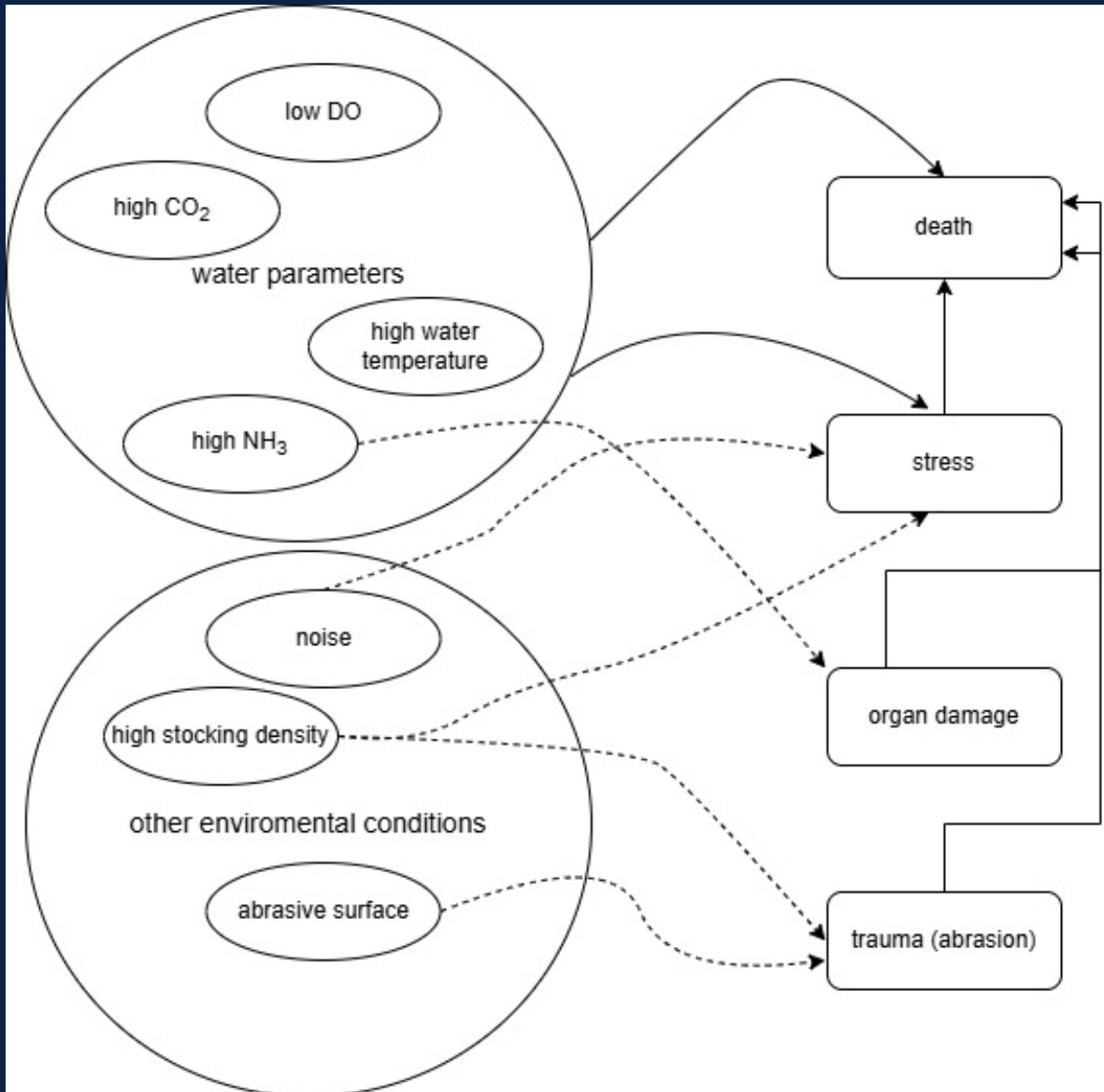


Stages in live fish transport

Fish handling (intrinsic to transport)

Welfare hazard	Welfare impact					
	Stress	Hypoxia (stress)	Physical trauma (pain)	Exhaustion (stress)	Hunger (stress)	
Pre-transport starvation	✓				✓	
Crowding	✓	✓	✓			
Removal from water	✓	✓				
Pumping through pipes	✓	✓	✓	✓		
Dry brailing	✓		✓			
Wet brailing			✓			
Pond drainage	✓	✓	✓			

Welfare during transport



Associations between environmental factors associated with transport and welfare impacts

Welfare hazard	Welfare impacts				
	Stress (mental)	Stress (metabolic)	Hypoxia (stress)	Physical trauma (pain)	Exhaustion (stress)
Poor water quality	✓	✓	✓	✓ ²	
High water temperature	✓	✓			
Low water temperature	✓	✓			
High density of fish	✓	✓		✓	
Abrasive surfaces				✓	
Noise	✓				
High tow speed ¹					✓

¹applies only to towing fish cages; ²organ damage if water quality extremely poor

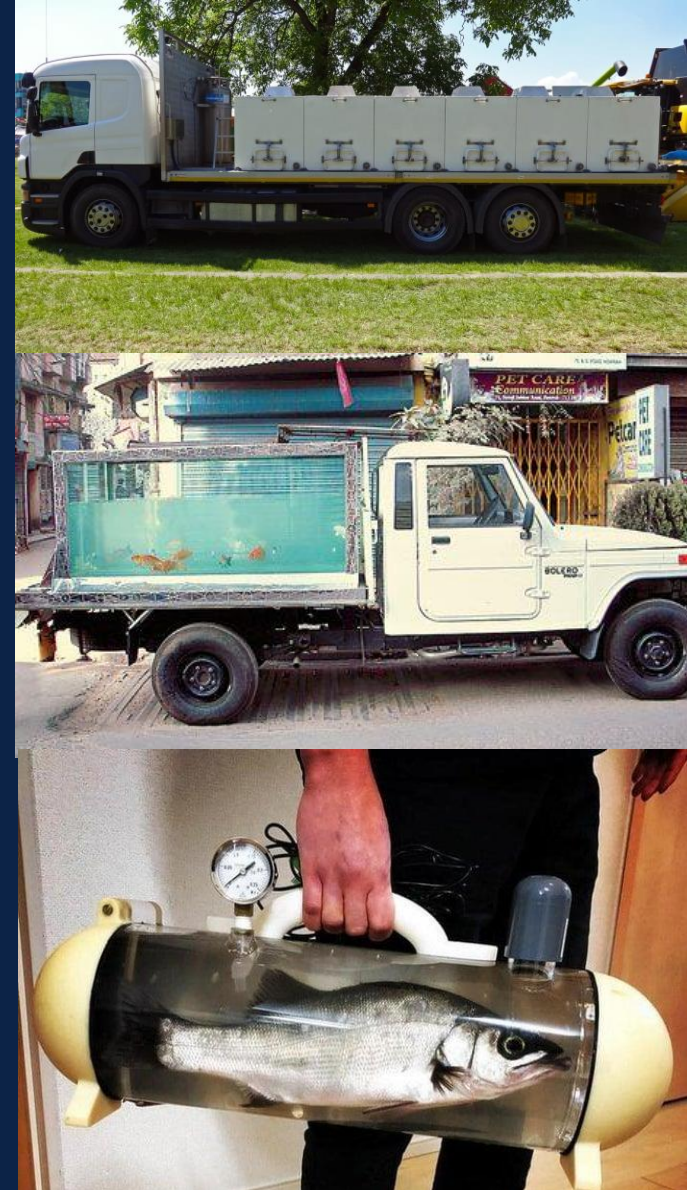
Transport method	Welfare impacts				
	Stress	Stress (metabolic)	Hypoxia (stress)	Physical trauma (pain)	Exhaustion (stress)
Wellboats (closed)	✓	✓	✓	✓	
Wellboats (open)	✓			✓	
Lorry (closed)	✓	✓	✓	✓	
Lorry (open)	✓			✓	
Helicopter	✓		✓	✓	
Air freight	✓	✓	✓		
Towing cages	✓			✓	✓

Welfare during transport (7.2)

Responsibilities of the Competent Authority

Establishing minimum standards for fish welfare during transport, including

- examination before, during and after their transport
- appropriate certification
- record keeping
- awareness and training of personnel involved in transport
- providing training to their respective staff



Welfare at killing (7.3)

Methods of stunning and killing

Method	Welfare hazard
• Manual percussive stunning • Automated percussive stunning • Electrical stunning • Asphyxia (e.g. in ice/ice slurry) • Carbon dioxide (CO₂) narcosis & gill slitting • Live chilling & gill slitting • Gill slitting and evisceration without pre-stunning • Physical brain destruction	1 Handling 2 Time out of water 3 Mis-stun 4 Crowded swimming in the system 5 Crowding prior to stunning 6 Low current or voltage (mis-stun) 7 Mis-cut 8 Temperature shock 9 Exsanguination 10 Evisceration 11 Poor water quality 12 Exposure to high level of CO₂ 13 Exsanguination

What is the role of the CA in welfare at slaughter?

- Legislation that stipulates approved methods of slaughter
- Licensing and auditing of slaughter facilities against conditions of authorisation



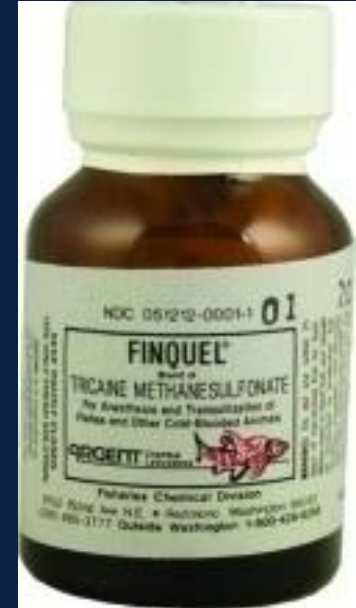
Killing farmed fish for disease control purposes

- Fish welfare considerations should be addressed within **contingency plans** for disease control.
- The killing method should be selected taking into consideration **fish welfare** and **biosecurity requirements**
- Procedures for the killing of fish on affected premises for disease control purposes should be developed by the operator and **approved by the Competent Authority**



Methods for killing for disease control

- Methods approved for killing of fish for consumption
- Anaesthetic agents
- Maceration (for larval stages)
- (Decapitation)



What is the role of the CA killing for disease control?

Option 1

- Lead operational team responsible for planning & implementation
- Included in contingency planning for disease outbreaks

Option 2

- Approve of killing methods, plans and team led by on-site personnel



Discussion

- Should there be standards for other aspects of fish farming?
 - The culling of individual farmed fish in the course of farming operations
 - Stocking rates
 - Routine handling
- Should standards be extended to
 - Ornamental fish
 - Amphibians
 - Crustaceans



MARCH 10, 2025

Co-op is the latest UK supermarket to end prawn eyestalk ablation

 Erin Spampinato published in [Aquaculture](#)



Waitrose phasing out ice-slurry slaughter for prawns in its supply chain

 Erin Spampinato published in [Foodservice & Retail](#)

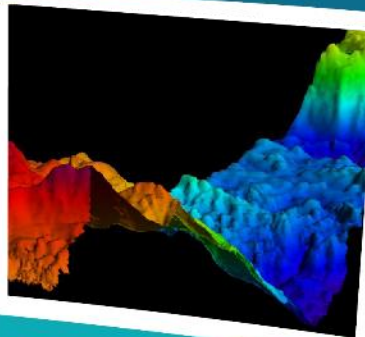


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ed.peeler@cefas.gov.uk

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