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Making Waves: Advancements in Aquaculture Welfare

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IFS Bangkok

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Content

1. Aquaculture welfare history
2. On-going and future challenges
3. Is it all just salmon?
4. Momentum is building

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FARMING EFFICIENCY	TECHNOLOGY INNOVATION	GOVERNANCE DEVELOPMENT
HEALTH MANAGEMENT	CERTIFICATION IMPROVEMENTS	ACTION RESEARCH
CORPORATE SOCIAL RESPONSIBILITY	ENVIRONMENTAL MANAGEMENT	PUBLIC-PRIVATE PARTNERSHIPS

Shrimp improvement Indonesia
Carp Nepal
Scaling tilapia in East Africa

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What does aquatic welfare mean?

- Good husbandry – all the aspects of good farming practice

- China – productive and healthy
- Indonesia – low competition for food
- Europe – space to swim
- East Africa – good environment

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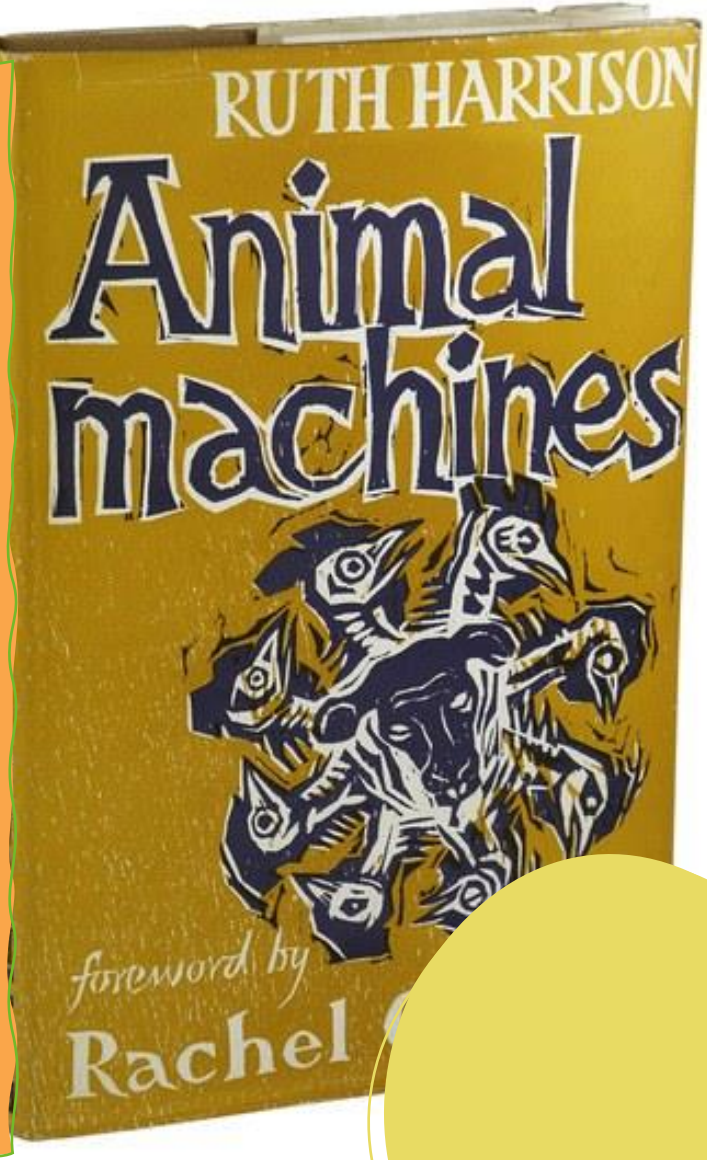
How have we progressed?

A few historical figures have put animal rights at the same level as human rights (Siddhartha Gautama, Pythagorus, Leonardo Da Vinci)

1823 – Bentham, British philosopher

1964 – Ruth Harrison's book "Animal machines"

1965 – Brambell report – development of "The Five Freedoms"



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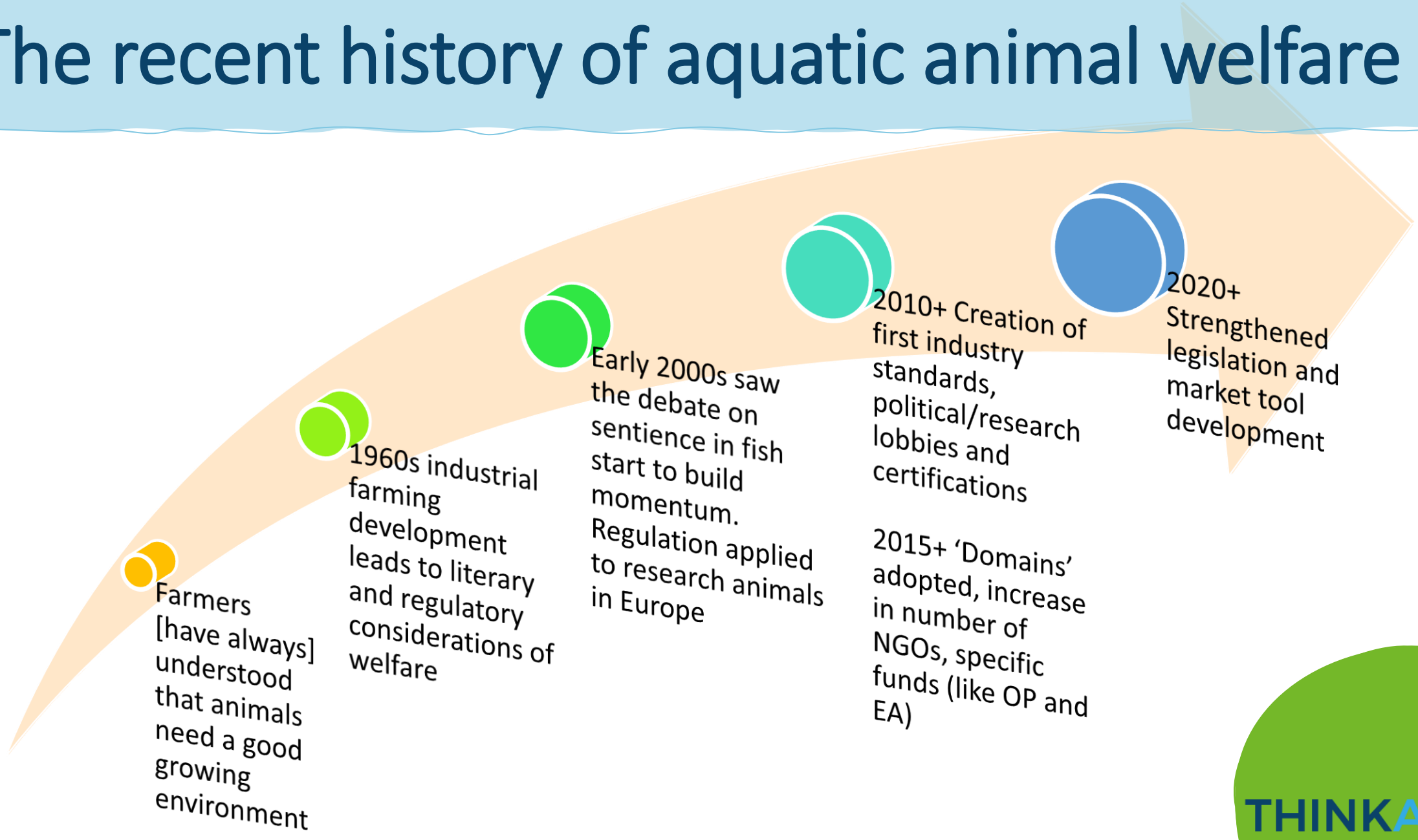
THE FIVE FREEDOMS

- Freedom from hunger or thirst
- Freedom from discomfort
- Freedom from pain, injury or disease
- Freedom to express (most) normal behavior
- Freedom from fear and distress

The recent history of aquatic animal welfare



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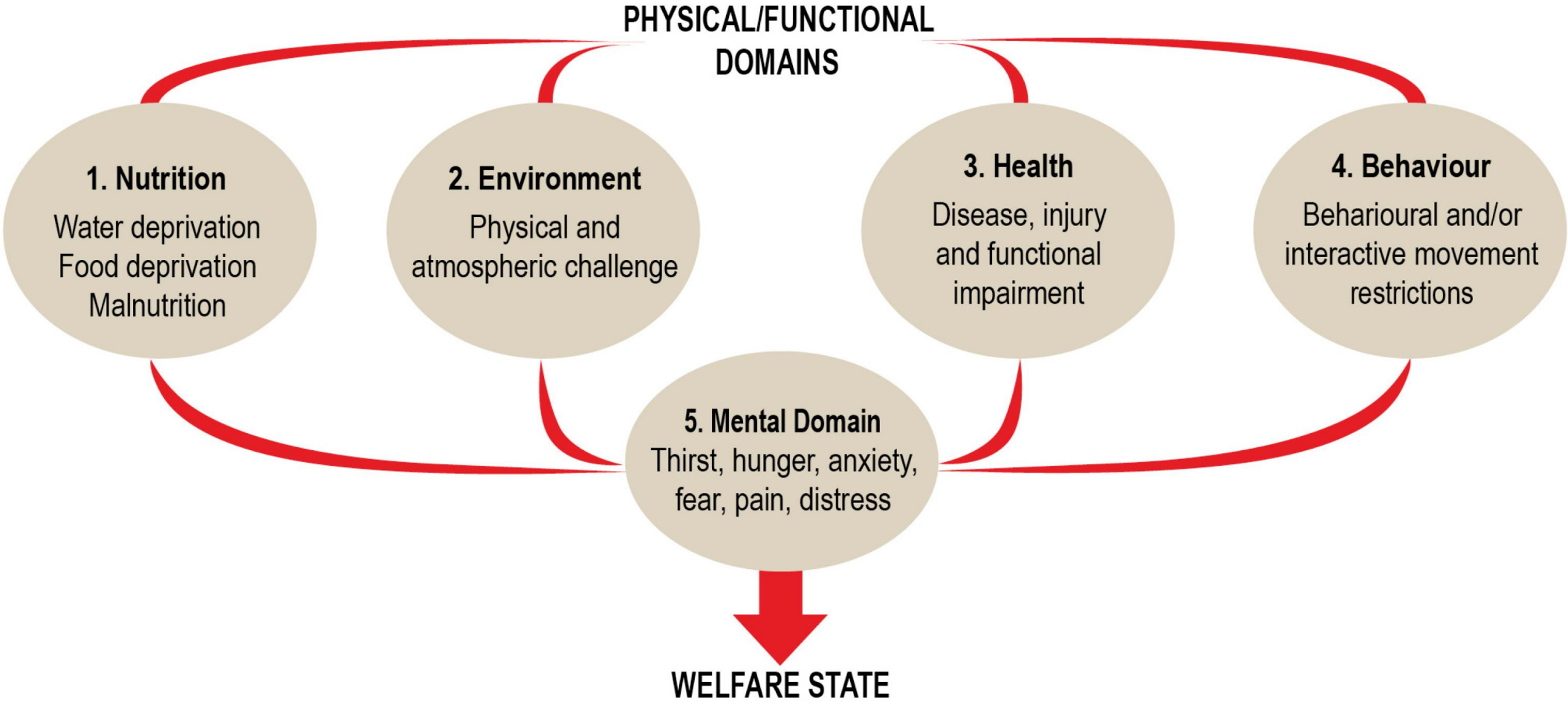
THE FIVE DOMAINS

Moving beyond the basic needs – for a fulfilling life



Mellor et al. 2020

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Five Freedoms	Five Domains
1. From hunger and thirst	1. Nutrition
2. From discomfort	2. Environment
3. From pain, injury and disease	3. Health
4. To express normal behaviour	4. Behavioural interactions
5. From fear and distress	5. Mental state/experiences

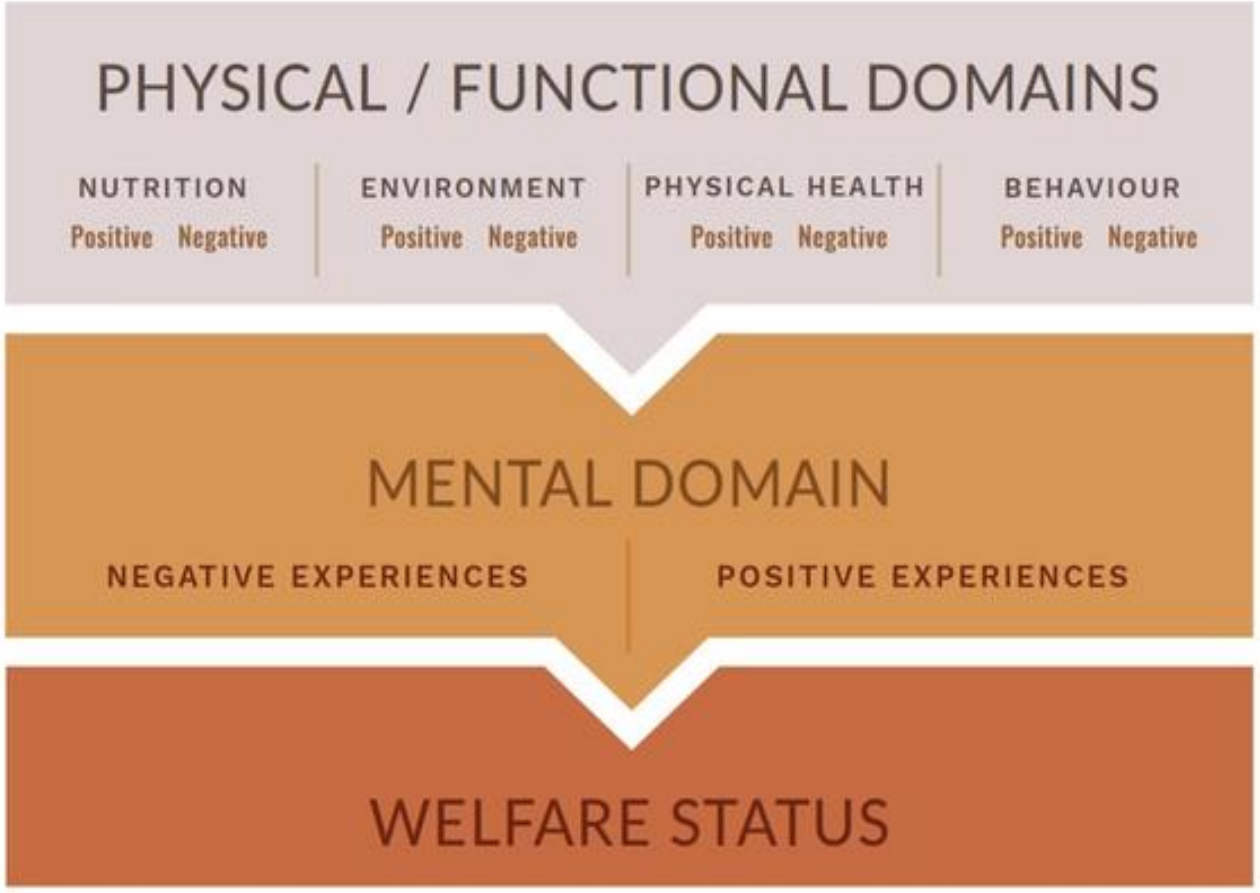

Image modified by WAZA from Mellor and Beausoleil 2015

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Activities Today

Industry

In the animal –

- Ensuring no pain during production and slaughter

In the system –

- Managing water quality
- Preventing disease
- Providing shelter

Research

- Eye-stalk ablation (shrimp)
- Cleaner fish welfare (salmon)
- Sentience (crustaceans, octopus)
- Data-driven evidence

Governance

- Global standards (ASC, BAP) include specific clauses around welfare
- More companies demanding higher welfare
- UK, Europe, NZ legislation in place

CERTIFICATION & WELFARE STANDARDS IN AQUACULTURE

- Late development of welfare standards and certification in aquaculture compared to terrestrial farming
- Certification have different level of welfare standards
- Standards should be species specific and life stage specific

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Challenge 1

Evidence: What data do we need to demonstrate good welfare? In animals it is difficult to track and could be invasive. Is it enough to collect data from the production environment?

Challenge 2

Cost: Does higher welfare cost more? Could I be more productive? Is the cost justifiable? Will the market pay more?

Challenge 3

Innovation: How do I deliver higher welfare? Who has the knowledge that I can apply? What data and tech can help me?

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ACTION

Who is the salmon?

The Atlantic salmon is migratory and can swim great distances in a short time.

Atlantic salmon have a lifespan of 5-13 years but in commercial production are slaughtered before they reach adulthood in most cases. Salmon are harvested at 3-6 kg.

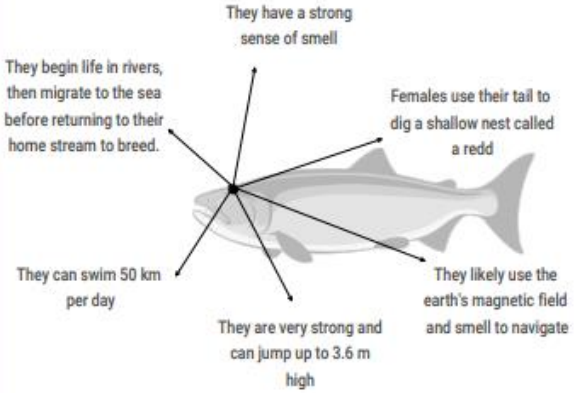
What does the salmon want?

TOP 10

1. to live in good quality water
2. to have access to food
3. to hunt for their food
4. to be disease and parasite free
5. to have space to swim
6. to choose their swimming depth
7. to escape dominant fish
8. to live in a natural environment
9. to have appropriate enrichment
10. to be able to migrate

What can salmon do?

Salmon are expert navigators



How do salmon spend their day?

Swimming

Resting

Hunting

Swimming

Salmon are migratory fish and swim great distances. Their prefered swimming depth depends on the environment such as temperature and currents

Hunting

Salmon are carnivorous and feed on insects and other invertebrates as juveniles. At sea, salmon hunt and eat small fish and crustaceans

Resting

Salmon tend to be nocturnal but can be diurnal based on temperature

Little is known about how salmon spend their time at sea including their social and resting behaviour

How can we provide salmon with a good quality life?

Provide meaningful environmental enrichment appropriate for each life stage

Prevent parasite infestations and disease

Give them a life that is free from pain and stress: no fin clipping

Give them enough space to swim, explore, and escape dominant fish

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Who is the carp?

Carp are native to Eurasia and have been introduced around the world by humans.

Carp are closely related to the goldfish

Carp live up to 20 years and the longest living carp lived 47 years but in commercial production are slaughtered at 2-14 months old , so they do not reach adulthood during their lifetime. Carp are harvested at 0.25-3 kg.

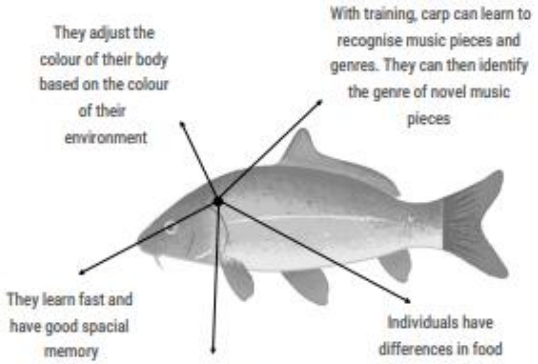
What does the carp want?

TOP 10

1. to live in good quality water
2. to have access to food
3. to forage for their food
4. to have space to swim
5. to choose the size of their school
6. to respond to environmental cues
7. to choose their swimming depth based on lifestage
8. to have natural substrate
9. to have vegetation and shelter
10. to be undisturbed

What can carp do?

Carp calm and scare easily



How do carp spend their day (or night)?

Swimming

Resting

Foraging

Swimming

Swimming behaviour varies with season: they aggregate during winter and early summer. Carp often swim in small schools with larger individuals becoming solitary.

Foraging

Carp are omnivorous fish who feed on plants, and scavenge the bottom for insects, crustaceans, crawfish, and benthic worms

Resting

Carp are mainly nocturnal. They are active during the night and swim less during the day

Although carp have been farmed since Roman times, little is known about their behaviour in the wild

How can we provide carp with a good quality life?

Give them environmental enrichment like a natural and diverse substrate, hiding places and cover

Give them nutritious food

Give them good quality water

Give them enough space to swim, explore, and escape dominant fish

Give them a life that is free from pain and stress: no fin clipping

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rspca.org.uk/adviceandwelfare/farm/fish

ali.fish/shrimp-welfare-recommendations

Key Welfar
Whiteleg S
in Aquacul

9.4 million tonnes

decapod crustaceans (shrimp, prawns, lobsters, etc.) produced from aquacul
2018[1] (more than 600 billion individual a

52.9%

of total crustacean production in aquaculture is composed of Whiteleg shrimp (Penaeus vannamei or

shrimpwelfareproject.org

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Shrimp Welfare Project
aims to improve the liv
of billions of
farmed shrimps

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Welfare Project

mental Welfare Issues for Tilapia

story to that of the pig and poultry sectors 30-40 years ago, focused on removing the
ges, rather than meeting the animals' health and welfare needs.

efully about how we can provide animal-centred systems for farmed fish that are

fishwelfareinitiative.in

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As the second-highest fish producing country in the world, India needs better fish welfare.

Because improved welfare means thriving businesses, healthy societies, sustainable environments, and, most importantly, reduced fish suffering.

The differentiated steps, or levels, help communicate to

Tag

shrimp welfare

Innovation & Investment

Innovation Award 2020 finalist: Simao Zacarias' shrimp eyestalk ablation research

Farmed shrimp eyestalk ablation research is one of three finalists for the Global Aquaculture Alliance's annual Global

Many hurdles remain

Understanding

We need more scientific and industry research to positively deliver on the Five Domains

Finance

Investment in research, technology, regulation and in supply chains

Capacity

Commitment from governments and the industry to scale the momentum. Professional support for companies to make improvements

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