PROMOTING

AQUATIC ANIMAL WELFARE

A VITAL PERSPECTIVE FOR AFRICA

7th Africa Animal Welfare Conference – 2023
Wasseem Emam
OUTLINE

• Why should we care about the welfare of aquatic animals?
• The scale of the problem
• Challenges faced by aquatic animals
• Ways to measure their welfare
• What we are doing in Africa
WHY SHOULD WE CARE ABOUT THE WELFARE OF AQUATIC ANIMALS?

- Biodiversity and ecosystem health
- Environmental balance
- Economic importance
- Global interconnectedness

& many more
FISH ARE COMPLEX
FISH ARE COMPLEX

- Fish are capable of learning complex tasks
- Fish have long memories
- Fish have social relationships
- Many fish enjoy having contact with other fish
- Many fish recognise other known individuals by sight
- Fish can be fooled by the same optical illusions as humans
COMPLEX INDIVIDUALS

Atlantic salmon
Migrates hundreds of km at before returning to its home river.

Tilapia
Makes nests in mud, scents the surrounding water, and defends from invaders.

Herring
When shoaling, maintain exactly the right spacing to catch escaping prey.

Pufferfish
A tiny pufferfish makes and decorates elaborate patterns to attract a mate.
FISH FEEL PAIN
# FISH FEEL PAIN

## Pain Criteria for animals

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Mammals</th>
<th>Birds</th>
<th>Reptiles / Amphibians</th>
<th>Fish</th>
<th>Cephalopods</th>
<th>Decapods</th>
<th>Insects</th>
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<tbody>
<tr>
<td>Nociceptors, CNS pathways &amp; processing</td>
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<td>Analgesic receptors</td>
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<td>Physiological responses</td>
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<td>Learned avoidance</td>
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<td>Protective behaviour</td>
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<td>Drugs reduce response</td>
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<td>Self-admin of drugs</td>
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<td>Pain takes priority</td>
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<td>Change in behavioural preferences/choices</td>
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<td>Pay cost to avoid pain</td>
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<td>Trade off pain with other requirements</td>
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Adapted from Walters 2018
USES OF AQUATIC ANIMALS
AQUATIC ANIMALS ARE USED IN MANY WAYS

- Food (farmed)
- Food (wild caught)
- Recreational fishing
- Biomedical sciences
- Pets and/or decoration
SCALE
OF THE PROBLEM
Promoting Aquatic Animal Welfare: A Vital Perspective for Africa

SCALE OF THE PROBLEM

Number of animals slaughtered every year globally

<table>
<thead>
<tr>
<th>Category</th>
<th>Estimate</th>
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<tbody>
<tr>
<td>Fish</td>
<td>at least 787 billion wild (up to 2.3 trillion)</td>
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<tr>
<td></td>
<td>at least 51 billion farmed (up to 167 billion)</td>
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<tr>
<td>Chickens &amp; other poultry</td>
<td>86.5 billion**</td>
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<tr>
<td>Pigs</td>
<td>2.2 billion**</td>
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<tr>
<td>Rabbits</td>
<td>1.5 billion**</td>
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<tr>
<td>Sheep &amp; goats</td>
<td>1.3 billion**</td>
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<tr>
<td>Cattle</td>
<td>340 million**</td>
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</tbody>
</table>

*Fish caught or farmed for meat annually from 2007 - 2016, fishcount.org.uk
**Killed for meat 2018, FAO
Source: http://fishcount.org.uk/studydatascreens/2016/fishcount_estimates_list.php

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WELFARE ISSUES IN CAPTURE FISHERIES

**Capture:**
- Crowding
- Hypoxia
- Injury
- Fatigue/Exhaustion

**Retrieval:**
- Barotrauma
- Temperature shock
- Osmoregulatory distress
- Injury
- Light exposure
- Crowding
- Emersion

**Handling:**
- Emersion
- Crowding
- Hypoxia
- Injury
- Light Exposure
- Temperature shock

**Slaughter:**
- Emersion
- Crowding
- Temperature shock
- Hypoxia

**Release/Escape:**
- Temperature shock
- Barotrauma
- Osmoregulatory distress
- Fatigue/Exhaustion
- Emersion
- Injury
- Light exposure
- Displacement
- Predation

Cumulative Stress
SEAFOOD PRODUCTION: WILD FISH CATCH VS. AQUACULTURE – WORLD

Source: Food and Agriculture Organization of the United Nations (via World Bank)
OurWorldInData.org/fish-and-overfishing • CC BY
WILD FISH CATCH VS. AQUACULTURE – AFRICA

Source: Food and Agriculture Organization of the United Nations

OurWorldInData.org/fish-and-overfishing • CC BY
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AQUACULTURE GROWTH IN AFRICA

Source: Food and Agriculture Organization of the United Nations (via World Bank)  
OurWorldInData.org/fish-and-overfishing • CC BY
CHALLENGES
FACED BY AQUATIC ANIMALS
THE AQUACULTURE JOURNEY OF A FISH

Rearing
Broodstock → Egg collection/striping → Hatching → Incubation → First feed

Transport
By land - Tanks on trucks  By sea - Well-boats

Growing on
Ponds  Tanks and raceways  Cages

Wild capture
Young/Adult fish

Transport
By land - Tanks on trucks  By sea - Well-boats

Slaughter
DIVERSITY
OF ANIMALS
DIVERSITY IN SPECIES

Adapted from FishEthoGroup 2021
DIVERSITY IN FARMING METHODS

Cages

Earthen ponds

Adapted from FishEthoGroup 2021
KEY WELFARE ISSUES IN AQUACULTURE

Water quality
Temperature, CO₂, pH, oxygen levels, etc. → different fish species survive better in different conditions.

Handling procedures
Farmed fish are sometimes handled, vaccinated or graded according to their size. These procedures can be stressful for the fish, for example if they are taken out of the water.

Stocking densities
Research and practical experience has shown that, on its own, stocking density is not necessarily one of the most important things affecting fish welfare.

Transport
Extra attention is needed during transport, particularly when the fish are loaded and unloaded, essential to maintain the correct water quality.

Slaughter
Stunning and slaughter methods are diverse.

RSCPA website
WHAT DOES GOOD WELFARE LOOK LIKE FOR FISH?

**Resources**
- Feeding
- Nutrition

**Environment**
- Respiration
- Osmotic balance
- Thermal regulation
- Good water quality

**Health**
- Body care
- Hygiene
- Safety and protection

**Behaviour**
- Behavioural control
- Social contact
- Rest
- Exploration
- Sexual behaviour

**Feelings**
- e.g. hunger, satiation, pain, panic

**Welfare Status**

*Fig. 2.1. The welfare needs of salmon can broadly be categorised into available resources, a suitable water environment, good health and freedom to express behaviors. The degree of fulfillment of these needs affects their mental state and thereby the welfare status of the animals. Adapted from “Mellor, D. J., Patterson-Kane, E. & Stafford, K. J. (2009) The Sciences of Animal Welfare. John Wiley & Sons Ltd, Oxford, UK, 212 pp. Copyright 2009” with permission from Wiley-Blackwell.*
OUR WORK
IN AFRICA
WHAT WE ARE DOING IN AFRICA

• Surveying fish farms in Kenya and Egypt

• Collecting primary data from farm operators on routine farming practices

• Identifying the key points of low welfare in production

• Designing tailored training programs

• Establishing a baseline of experience and knowledge in fish health and welfare
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ACHIEVING FISH WELFARE REQUIRES A COLLABORATIVE APPROACH
CONCLUSIONS

• Aquatic animal welfare is closely linked to human welfare
• Fish feel pain and their welfare is important to consider.
• They are an extremely diverse group with different welfare needs.
• They are exploited in the trillions.
• There is lots of room for making improvements to their welfare.
• Communication and collaboration between stakeholders is essential.
THANK YOU

Wasseem Emam
www.ethicalseafoodresearch.com
REFERENCES
