Issues Facing Fish and Aquatic Animal Welfare

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Presentation overview

Part I. The Fish Welfare Dialogue:
- ◦ - About the Dialogue
- ◦ - Definitions of the Animal Welfare concept
- ◦ - Proposed topics for the Dialogue

Part II. Implementing the welfare concept in practice:
- ◦ - Reasoning for taking welfare measures in aquaculture
- ◦ - Highlights on specific welfare requirements of aquatic animals
- ◦ - Fish welfare assessment tools: *water quality & SWIM*

About the Fish Welfare Dialogue

➢ To engage a wide audience from animal owners and academics to industries and governmental agencies

➢ Individual professionals from all disciplines, or the public will be able to actively participate in discussion forums

➢ Critical issues facing fish and other aquatic animal welfare – from philosophy and ethics, to current or future guidelines or regulations

➢ Continuing Education and Professional Development (CEPD) credit will be available for veterinarians and professionals in other disciplines, and anyone that actively participates and contributes through the discussion forums

➢ Furthermore, we hope to select the leading individuals and most knowledgeable contributors as key note speakers for the "International Fish Welfare Conference" that is tentatively scheduled for 2015 in Munich.

Welfare Definitions

International Fish
Welfare Dialogue

➢ The welfare of an animal is its state as regards its attempts to cope with its environment. (Fraser & Broom, 1990)

➢ An animal's capacity to avoid suffering and sustain fitness. (Webster, 1995)

➢ Neither health nor lack of stress nor fitness is necessary and/or sufficient to conclude that an animal has good welfare. Welfare is dependent on what animals feel. (Duncan, 1993)

➢ Five Freedoms. (FAWC, 1993)

➢ The quality of life as perceived by the animal themselves. (Stein *et al.*, 2013)

➢ Humane consideration and cause no intentional harm. (WAVMA, 2013)

Science, Philosophy and Ethics of fish welfare

➢ Is there an adequate science-based understanding of the fish welfare concept and   what are the gaps in the science?

➢ Should **aquatic animals used in research** benefit from the same welfare standards as **terrestrial animals**?

➢ Are we morally obliged to respect their lives to ensure their well-being?

➢ What is happiness? Do fish feel happiness? Can happiness be a means of welfare assessment in fish?

➢ Do the current welfare concepts accommodate the issues arising in practice?

Science, Philosophy and Ethics of fish welfare

➢ Is domestication an unnatural process?

➢ Does it enslave animals?

➢ Is it immoral to take animals from their wild habitats and confine them in zoos/aquaria?

➢ To what extent can we use animals? Working toward a new ethic in human-animal relationship : from reducing animal suffering to halting virtually all use of animals (e.g. a retreat from flesh-eating or vegetarianism, banning catch and release fishing etc.);

➢ Animals rights *versus* animal welfare.

Conditions that impact on fish welfare

➢ **Physical state** (*e.g.* injury, disease);

➢ **Mental state** (*i.e.* sentience or consciousness – hunger, fear, pain, social behaviour);

➢ **Husbandry practices & operating system designs** (*e.g.* environmental pollution, water flow, high stock density, slaughter, transportation, handling);

➢ **Catch-and-release fishing**.

Interpreting welfare observations and measurements

➢ What are the most reliable identification and interpretation criteria?

➢ At what age do fish develop consciousness?

➢ Should monitoring be at group or individual level?

➢ What welfare indicators are reliable assessment tools?

➢ Does welfare correlate with productivity?

➢ Financial cost implications in aquaculture?

➢ Consumer's perception of farmed fish?

Welfare legislation & law enforcement

➢ What are the optimal fish welfare conditions that legislation should consider?

➢ What are the gaps in legislation, codes of practices and accreditation schemes?

➢ Who should enforce welfare laws and policy implementation on farms?
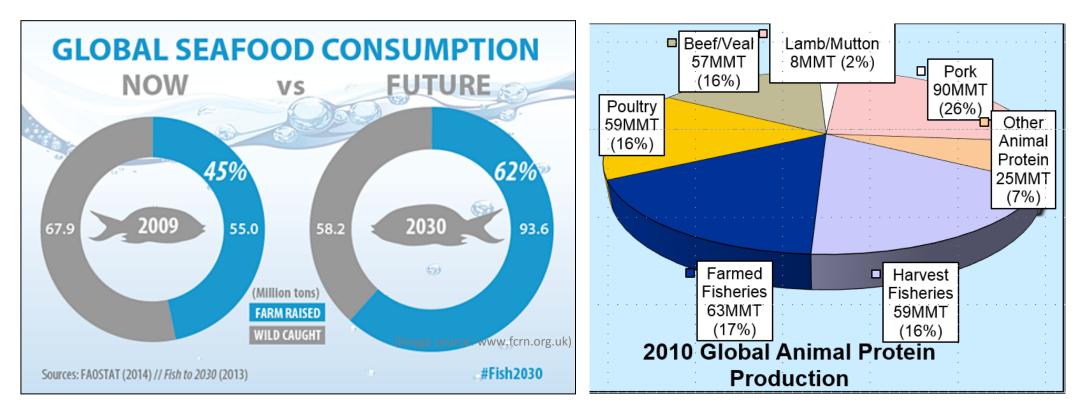
Aquatic animal welfare education

➢ State of knowledge and current understanding

➢ Should the veterinary profession take sole responsibility for educating stakeholders?

➢ Should fish welfare be taught to undergraduates?

➢ What approaches to be used in teaching fish welfare in schools?

Requirement for Welfare

"Predictions are that by 2050 half the animal protein consumed by people will come from aquaculture."
(Barry O'Neil, President OIE Aquatic Commission – May 2009)

Diversity

Over 300 species across several Phyla farmed

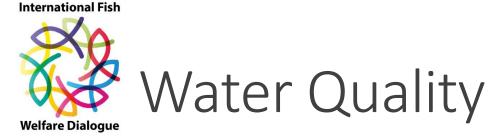Habitats/ecosystems

Physiological requirements

Complexity

Trout are used for food, sports fisheries, restocking, laboratory

Carp –Don't feed below 8-10^{0}C, immune system best ~25^{0}C

Volume rather than area

Predator or prey

Sentience and Emotions of Lower Vertebrates & Invertebrates

Environmental Enrichment

Water Quality

pH, temperature, DO_2, NH_3, NO_2, NO_3 a minimum in recirculation systems

But ~ 36 interacting parameters may need to be measured

Been used for decades and can be easy to measure

Requires an understanding of basic chemistry

SWIM
(Salmon Welfare Index Model)

International Fish Welfare Dialogue

SWIM 1.0 Reviews in Aquaculture (2013) 5, 33 – 57

For farmers

SWIM 2.0 Reviews in Aquaculture (2013) 5, 1 – 18

Extends SWIM 1.0

Environment	Animal	Sea Cage	Individual
Temperature °C	Mortality % day^{-1}	Aberrant Fish	Eyes
Salinity	Appetite	Necropsy of dead fish	Cardiac Condition
Oxygen %	Sea lice	Active Euthanasia	Abdominal Organs
Water current BL s^{-1}	Condition factor		Gills
Stocking density Kg $^{m-3}$	Emaciation state		Opercula
Lighting	Vertebral deformation		Skeletal Muscles
Disturbances	Sexual maturity stage		Vaccine related pathology
	Smoltification state		
	Fin condition		
	Skin condition		

Objectives

Anthropomorphic public opinion

Scientific justifications

Legislation/regulations

Reduced to common principles

Welfare input = humane considerations/treatment and/or cause no intentional harm

Public Opinion

Driven by extreme endpoints

Polarised opinion

Unfounded facts

Anthropomorphic interpretation
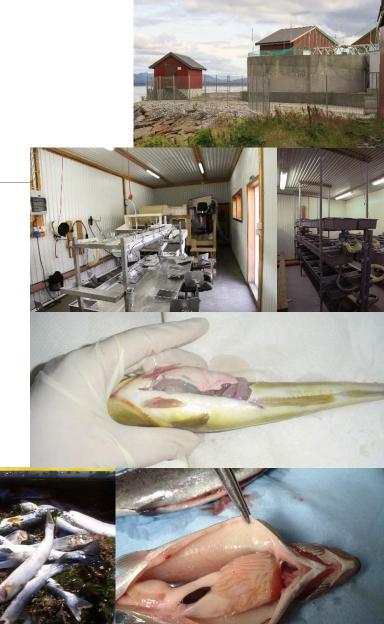
Emotional interpretation

Misdirected conclusions

Science

We Don't Know – behavioural, neuro-physiological

Health

Five freedoms

Defining stress – using cortisol but is a survival instinct so normal

Acute v Chronic stress & cortisol

Science

Reputable publications have twisted scientific interpretations to come to non-impartial and objective conclusions

Bottom line even amongst scientists they are not talking a common language or have consensus of opinion

Health

25% losses during production process

<0.5% losses during transport if properly prepared

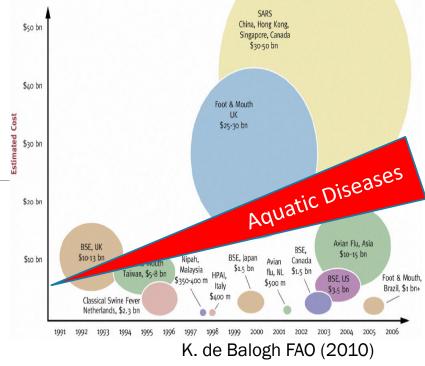Vaccines – requires live virus

Lack of Veterinary Care

Better equipment

Better vaccines

Better surveillance

Better biosecurity

Better training for staff

Better access to training for vets

K. de Balogh FAO (2010)

Legislation/Regulation

IATA only global regulation
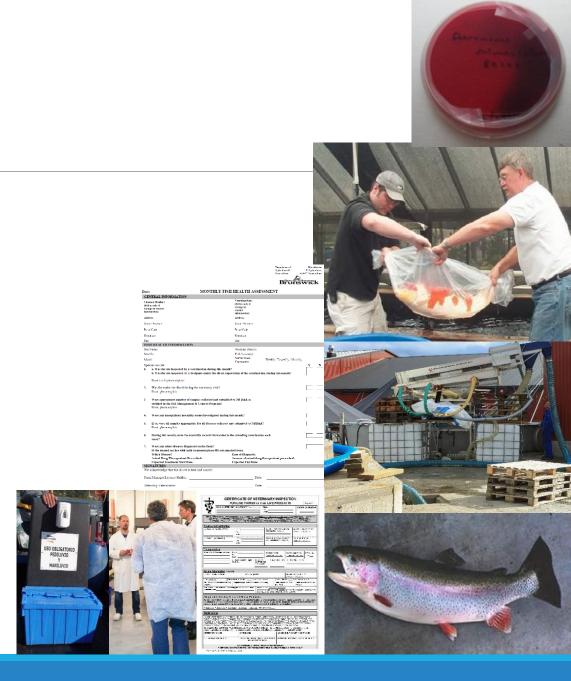
Possibly OIE Welfare

No global legislation

Regional legislation

Country legislation

Legislation/ regulations vary between countries
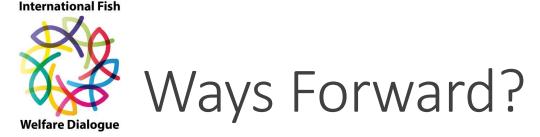
Common Principles

Diversity of public opinion

Diversity of scientific opinion

Diversity of species and habitat

Diversity of health

Diversity of legislation

Diversity of regulation

No one-size fits all

Required for Food

Required for human wellbeing

Ways Forward?

Humane consideration and cause no intentional harm.

Join in and contribute to the fishwelfare.org webinars and dialogue.

Consider WAVMA's Cert AqV see www.wavma.org/CertAqV-Pgm

Thank You For Listening!