Health and welfare monitoring of fish used in research

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• **Short presentation of the project**
  – National platforms for Alternatives
  – The 3 R’s (Replace Reduce, Refine)
  – International conference

• **Health monitoring of fish used in research**
  – Why is it so important?
  – Why is it so difficult?

• **Welfare monitoring**
  – What do we know of the wellbeing of fish?
Currently existing ecopa membership platforms

Pilot project for the plans of a Norwegian platform for alternatives approved by ecopa
What is a national platform for alternatives?

- **Members from**
  - Animal welfare organizations
  - The industry
  - Academia
  - Governmental institutions

- **3 R's strategy**
  - Reduce the number of animals used in research
  - Replace animals with *in vitro* methods
  - Refine methods to reduce the number of animals used
Number of research animals in Norway

- Mammals
- Fish

- 1985-2004
What do we want to reduce?

The aim should be to obtain as much information as possible from each fish used in research.

3 R's strategy
Reduction by Replacement and Refinement

Increase NOT decrease research results
What is a research fish?
Which fish are included in the statistics?

Research fish or fish used in research

Better definitions are needed!
What are research fish used for?

- Basic research: 85281
- Toxicological & safety evaluation: 38565
- Education: 797
- Other: 48642
- R & D: 94090

Number of research fish
Norway 2003
International consensus meeting
“Harmonisation of the Care and Use of Fish in Research”

- Gardermoen, Norway 23rd - 26th May 2005
- 99 researchers from 10 countries
- Great need for harmonisation
  - Definition of research fish
  - “Best practice” for care and use
- [http://oslovet.veths.no/fish](http://oslovet.veths.no/fish)
3 main reasons why the number of fish used in research are so high

• **Set regulations with no alternatives**
  – The pharmacopoeia states how many fish that has do be used for acceptance of vaccines and medicines

• **Lack of alternatives**
  – Research on alternatives have not been focused
  – Basic knowledge often sparse

• **Lack of standardization**
  – Fish and physical conditions
  – Difficult to compare results
  – Some models established for fish species like zebrafish
  – Lack of knowledge of the health status of the research fish
Health monitoring of fish used in research

What’s the point?
We use only healthy fish in our research, or?
healthy fish were randomly sampled at a commercial fish farm...

Is monitoring of health by only looking at the fish sufficient?
Wild Rainbow trout

Farmed Rainbow trout
1 year old Atlantic halibut
Two studies of heart inflammation (epicarditis) in clinically healthy farmed halibut

<table>
<thead>
<tr>
<th>Halibut</th>
<th>Epicarditis Farm I</th>
<th>Epicarditis Farm II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low growth rate</td>
<td>4% (1/23)</td>
<td>10% (1/10)</td>
</tr>
<tr>
<td>High growth rate</td>
<td>45% (25/55)</td>
<td>90% (18/20)</td>
</tr>
</tbody>
</table>

Farm I: Johansen et al. (2004)
Farm II: Johansen and Poppe (2002)
Health monitoring

- Nutrition
- Immune status
- Non-infectious diseases
- Water quality
- Stress
- virulence
- Disease
- Environment
- and more...
- Pathogen
- Fish
The widest definitions of health includes welfare and the widest definitions of welfare includes health. Still, health and welfare are not the same.
Monitoring of fish welfare

- **The Fisheries society of the British Isles**
  - Briefing paper on web [http://www.le.ac.uk/biology/fsbi/welfare.pdf](http://www.le.ac.uk/biology/fsbi/welfare.pdf)
  - Review in Journal of fish biology 2006
  - Pain, stress, definitions etc.

- **2 Norwegian reports on fish welfare**
  - Needs for research on fish welfare (NFR)
    - "Forskningsbehov innen dyrevelferd i Norge"
  - Possibilities for welfare monitoring (Mattilsynet)
    - "Dyrevelferd i akvatisk dyrehold herunder fremtidens dyrehold"
Plenty of guidelines for the "care and use" of fish in research
http://oslovet.veths.no/fish

When it comes to monitoring the heath and welfare they state that a "fish health specialist" needs to be consulted
Even fish health specialists need guidelines, especially if you want harmonisation and standardisation.

We need species specific guidelines for health monitoring in each research discipline.
Thank you for your attention!

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