Inspection of Fish Facilities in the UK

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Numbers of fish used

Number of fish used (K)

Number

1990  2000  2010

0  100  200  300  400  500  600

1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20

Number of fish used (K)
Proportion of Animals used

2005
- Mice: 65%
- Rats: 18%
- Fish: 6%
- Reptiles/amphibians: 1%
- Birds: 4%
- Other mammals: 4%
- Other rodents: 2%

2008
- Mice: 66%
- Fish: 17%
- Rats: 10%
- Birds: 3%
- Other rodents: 1%
- Other mammal: 3%
- Reptile/amphibian: 1%
Proportion of Animals used

2005

- Mice: 65%
- Rats: 18%
- Fish: 6%
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- Birds: 4%
- Other mammals: 4%
- Other rodents: 2%

2008

- Mice: 65%
- Rats: 18%
- Fish: 6%
- Reptiles/amphibians: 4%
- Birds: 4%
- Other mammals: 4%
- Other rodents: 1%
- Other: 17%
- Parasites: 10%
- Parasites: 10%
Type of experiments

<table>
<thead>
<tr>
<th>Type of experiments</th>
<th>2005</th>
<th>2008</th>
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<tbody>
<tr>
<td>Applied Veterinary Medicine</td>
<td>32K</td>
<td>9K</td>
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<tr>
<td>Protection of man, animals or environment</td>
<td>42K</td>
<td>34K</td>
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<tr>
<td>Fundamental biological research</td>
<td>70K</td>
<td>244K</td>
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<tr>
<td>Breeding</td>
<td>26K</td>
<td>123K</td>
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<tr>
<td>Applied Studies – human medicine</td>
<td>194K</td>
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<tr>
<td>Sea water</td>
<td>Freshwater</td>
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<tr>
<td>Tropical</td>
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<td>Salmon</td>
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<tr>
<td>Cod</td>
<td>Trout</td>
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<tr>
<td>Turbot</td>
<td>Stickleback</td>
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<tr>
<td>Sheepshead Minnows</td>
<td>Fathead Minnows</td>
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<tr>
<td>Zebrafish</td>
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<tr>
<td>Cichlids</td>
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</tbody>
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Changes since 2005

- Communications
- Enrichment
- Facilities
- Legislation
  - Driving 3Rs
    - “Cosmetics” – Chronic Tox & Endocrine Disruption
    - Council of Europe - Welfare of Farmed Animals – Fish
    - Directive 86/609 Revision - Minimum standards for fish
  - Increasing numbers of experimental fish
    - European Water Directive
    - Ecoprotection
Communications

- Fish Care Staff Meetings
- Networks of animal care staff
- Laboratory Animal Science Association Meeting
- Network of vets - VOLE
- Fish Veterinary Society
- Zebrafish Networks
Zebrafish

- 2005 - multi-species units
- 2008 – increase in single species units
- Frameworks
  - speciesism
- Culture
  - Farming
  - Science / 3Rs
- Level of Training
Consideration of individual species

- Natural behaviours
  - Every day
  - Breeding
  - Alarm / distress
- Species dependent
- Age dependent
Environmental Enrichment

- Evidence
- Use

Examples

Challenge:
- Is the housing of sheepshead minnows in a tank filled only with good quality water the most refined method of husbandry?
Biosecurity

- Is it needed?
- What is needed?
- How is disease “prevented”?
Facility Design and Build
Old vs Newer
Why is disease a problem?

- To scientists
  - Inability to finish study
  - Variability
  - Not repeatable
  - Time to repeat
  - Poor quality science
  - Meaningless

- To vets and animal care staff
  - Disease – Welfare problems
  - Colony affected - supply
  - Carrier state

To Regulators:
- 3Rs
- Legislation to prevent disease spread
Notifiable diseases

- **List 1**
  - Infectious Salmon Anaemia (ISA)

- **List II Diseases**
  - Viral Haemorrhagic Septicaemia (VHS)
  - Infectious Haematopoietic Necrosis (IHN)

- **List III Diseases**
  - Spring Viraemia of Carp (SVC)
  - Gyrodactylosis (caused by *G. Salaris*)
  - Bacterial Kidney Disease (BKD)
  - Furunculosis in Salmon (FRC)
  - Infectious Pancreatic Necrosis (IPN) in salmon
Towards SPF fish?

- Listed diseases
- Mycobacterium marinum
- Microsporidium??
- Infectious Pancreatic Necrosis
- Fungal Infections
Sourcing / Screening

- **Origin**
  - Open / closed colony
  - Documented disease-free status

- **Quarantine adequate?**
  - Isolation
  - How long?

- **Examinations**
  - New consignments
  - Regular screening
Precautions - Fish & Water

- Bleach eggs
- Non-movement of adults
- Sterilize the water
- Minimise contact between different tanks
  - Fish
  - Water
- Adequate disposal procedures
  - Fish
  - Water
- Protocols?
Precautions - Equipment

- Clean and Sterilise
  - Nets
  - Siphons
  - Enrichment
- Have enough
- Use appropriate disinfectants (timing)
- Adequate disposal procedures
- Protocols?
Precautions - People

- Minimum numbers of people
- Footbaths
- Protective clothing
  - Shoes
  - Coats
  - Gloves
  - Purpose
  - Effectiveness
- Disposal procedures
- Wash hands and arms
- Protocols?
Backups

- What happens when it all goes wrong?

Fail safe  Fail dangerous
What Home Office Requires

- System dependent
- Know the system and the species
- Analyse the system
  - Fail safe
  - Fail unsafe
- Welfare consequences
  - What
  - How long
Action

- “Emergency plan”
- Welfare of fish
  - Ensure interventions
  - Within appropriate timeframe
- Justification for not putting in backups
  - Risk
  - Consequences
  - (Expense)
Sampling for DNA

- Genetic fingerprinting
- Not Identification