

Experiences from Inspection of Fish Research Facilities in the UK

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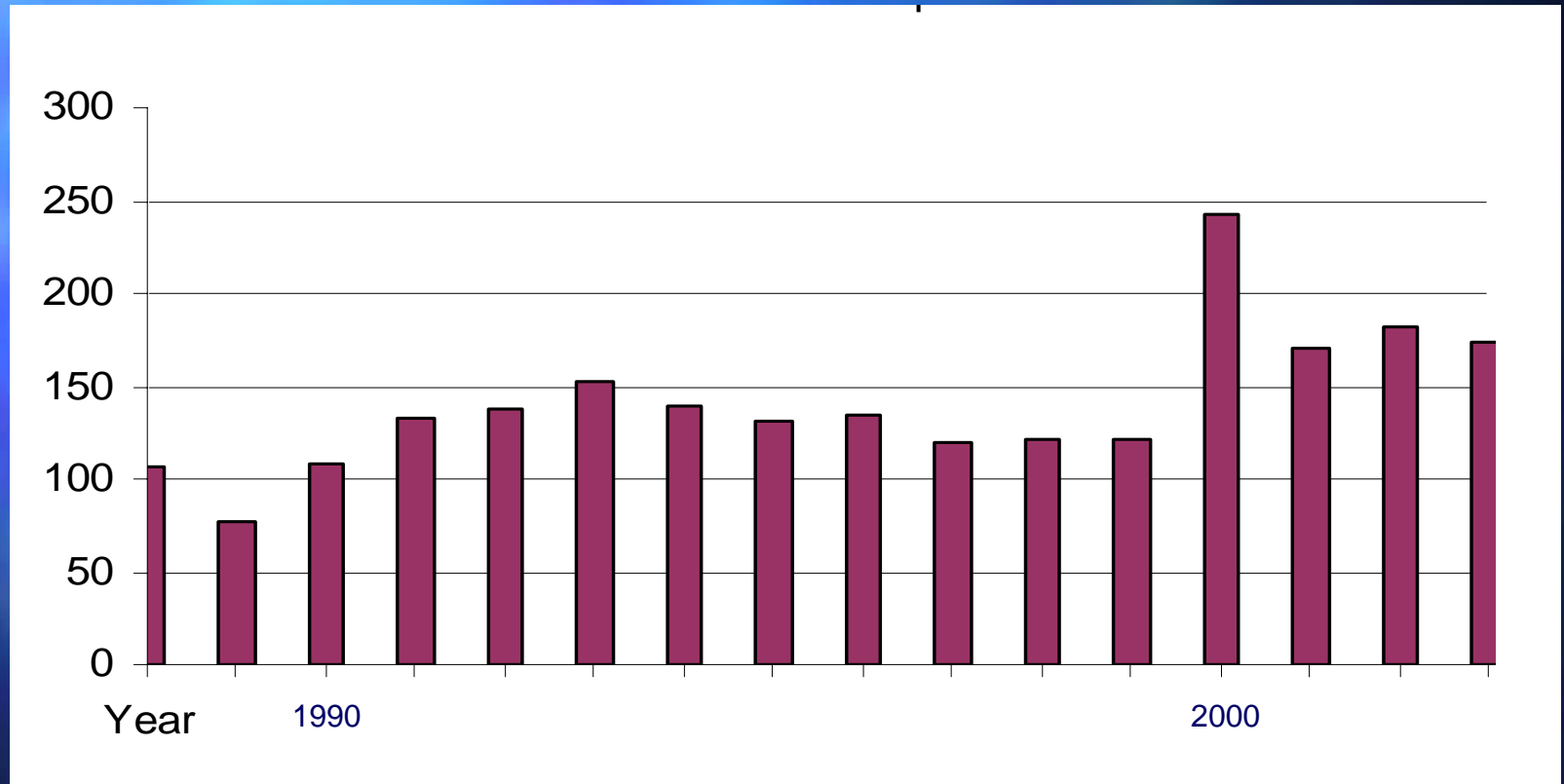
Animals (Scientific Procedures) Inspectorate

Home Office, UK

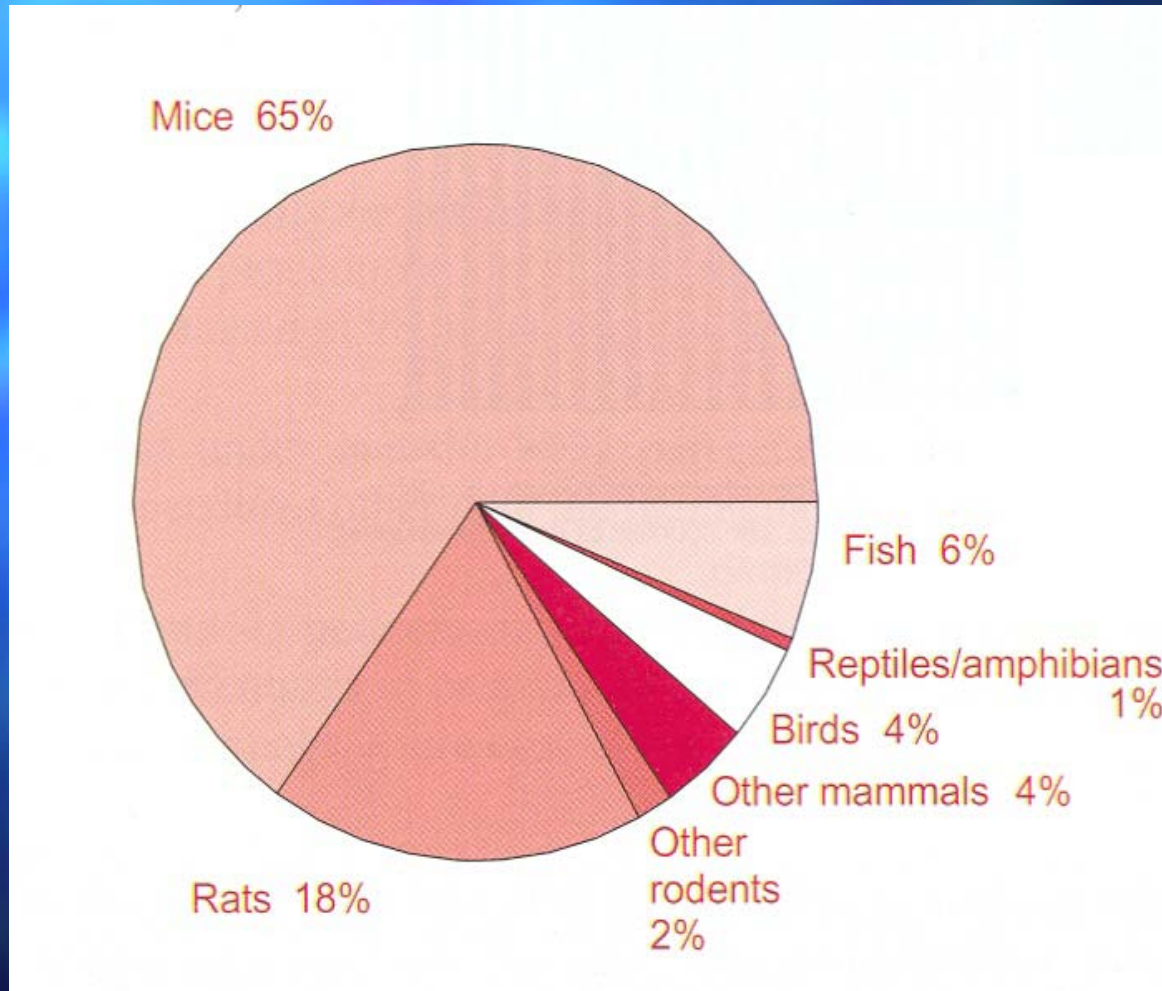
Area Covered

- England
- Wales
- Scotland
- Northern Ireland
- NOT Isle of Man
- 12 mile limit

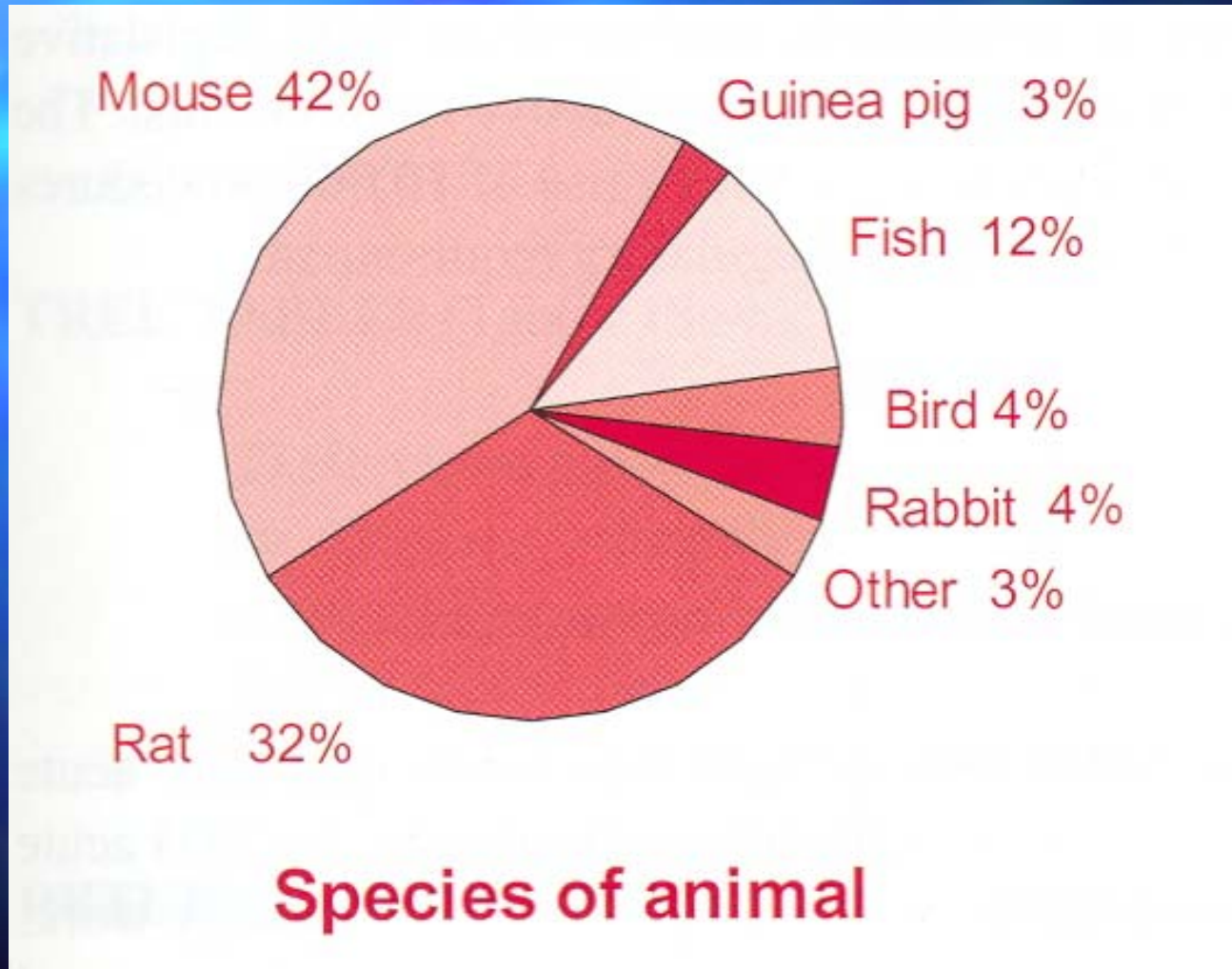
Numbers of fish used



Numbers of Animals used



Numbers of Animals used in Toxicology



Species

Sea water

Freshwater

Tropical

Zebrafish

Cichlids

Temperate

Salmon

Salmon

Cod

Trout

Turbot

Stickleback





Type of experiments

- Fundamental biological research 70K
- Protection of man, animals or environment 42K
- Applied Veterinary Medicine 32K
- Breeding 26K

Fundamental Biological Research

- Behaviour
 - Wild, mate preference, aggression
- Welfare
 - stocking density, optimising husbandry
- Physiology
 - salt balance, growth and maturation

Protection of Man, Animals or Environment

- Ecotoxicology
- Safety testing
- Vaccine testing

Applied Veterinary Medicine

- Pathogenesis
- Treatment
- Protection

Regulated Breeding

- Genetically Modified
 - Development
 - Growth
 - Disease resistance
- Saleable characteristics

Facilities















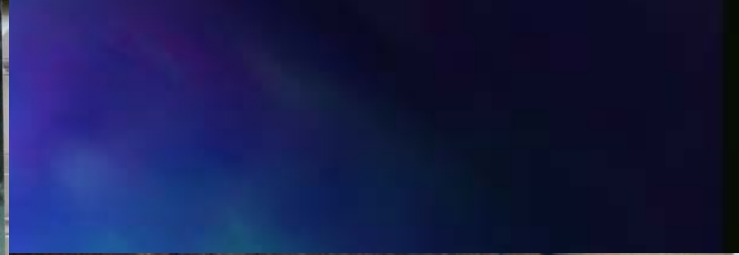
Health and Safety

Man and Animals



Maintenance









Surgical Instruments

Location, Location, Location



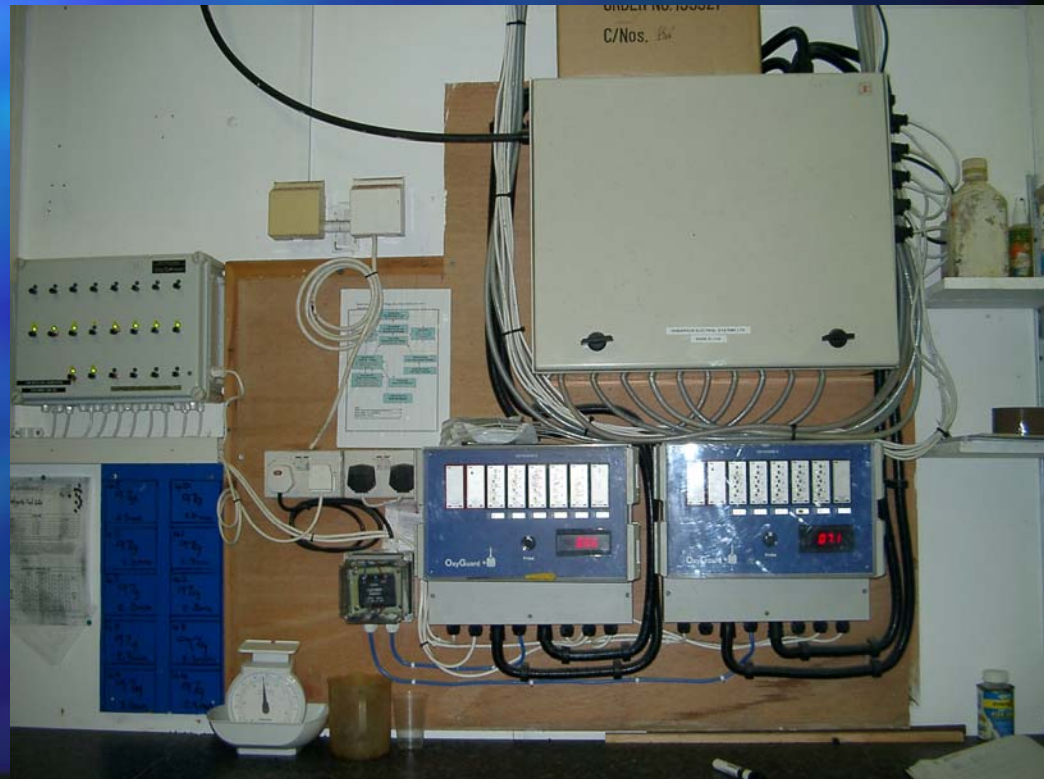
Security

- Site
- Accessibility
- Risk



Emergencies

- Alarms
 - power
 - water level
 - water parameters



Emergencies

Back-up systems

- generators
- Response times



The Future

- Understand
 - duplication of systems
 - pain
 - welfare
 - distress
- Develop
 - improvement strategies
- Test?

Environmental Enrichment

Is it important?

If so, why?





- Substrates
 - Sand
 - Gravel
- Vegetation
- Hides
 - stones
 - vegetation
- Company
- Space



“Testing”

- Choice / use
- Opinions of experts

Choice / use

- Optional
 - part of tank
- Observe use
- ??Measure use??











Opinions of “Experts”

- Animal Care & Welfare Officers
- Associate objects with fish
- Consensus view

Consensus ?

Species	Enrichment (>1/3)
Zebrafish	Plastic weed, hides, blood worm, conspecifics, gravel
Stickleback	Plastic weed, hides, blood worm
Guppy	Plastic weed, hides, blood worm
Eel	Tubes
Salmonid	Conspecifics, space
Mackerel	Conspecifics, space
Cod	Conspecifics
Sand Goby	Sand, gravel
Plaice	Sand
Turbot	Sand
Tilapia	?
Dogfish	?

Problems?

- Water quality
 - Sand
 - Rocks
- Hygiene
- Cost
- Variability

Solutions?

- Water quality
 - Drainage
- Hygiene
 - Durability
 - Sterilisation
 - Disposables
- Cost
 - Funding bodies?

Solutions?

- Variability

- Experimental design

- Enriched - control and test groups

- Additional experimental variable

- measured parameter with / without enrichment

- ? Statistical difference?

Analgesics!

Questions?

Consensus (2)

Species	Enrichment (>1/2)
Zebrafish	Plastic weed, blood worm, conspecifics
Stickleback	Plastic weed, hides
Guppy	Plastic weed, blood worm
Eel	Tubes
Salmonid	Conspecifics
Mackerel	Conspecifics
Cod	
Sand Goby	Sand, gravel
Plaice	Sand
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