Aquaculture Research – Consultation
BBSRC’s Remit in Aquaculture

• BBSRC Strategic Plan (2010-2015) highlights under the Food Security research priority that BBSRC will be “promoting research underpinning food production from aquaculture, where there is a need to increase the diversity of species that are used, improve fish health, and develop sustainable sources of feed for farmed fish”.

• BBSRC’s remit covers animal health and disease of livestock species and animal production which includes aquaculture. The BBSRC also funds basic research in laboratory fish species, including some physiology and welfare work which may be applicable to other fish species.
BBSRC & Aquaculture

• Developed a draft strategy in 2012- a review of the state of play in the UK. Identified a portfolio gap.
• Our Animal Disease working group noted a gap in basic science research in fish health
• BBSRC only receives a small number of aquaculture proposals, making it hard to judge what needed to change
• Therefore we wanted to know
  ➢ how much work was needed- is it a gap?
  ➢ In what areas could Research Council support be useful?
  ➢ The capacity of the community to respond?
Activities So Far

- BBSRC Consultation with the Aquaculture community at the ‘Healthy and Sustainable Aquatic Supply chain’ Biosciences KTN meeting-Glasgow, September 2013.

- about 60 members of the aquaculture academic and industrial communities.

- Identified the following gaps:
  - Diseases- fish and shellfish
  - Vaccines- delivery and ‘fit for purpose’
  - Microalgae
  - Shellfish – improved efficiency : technology, management , genomics
  - Environmental – water quality ,waste streams, coastal expansion
Activities So Far

- Aquaculture survey- Research challenges facing the aquaculture Industry- a follow up to the KTN consultation in 2013. Small response 21 people.

Basic Research Challenges

- Disease (incl reagents)
- Nutrition/management
- Development (incl new species)
- Genetics/markers
- Welfare
- Other
Breakdown of specific issues in the disease research area

- Detection
- Tools and reagents
- Treatments
- Host immunology
- Pathogen biology
Community Capacity

• All respondents identified expertise needs for specific problems and highlighted multidisciplinary requirements.

• Issues were:
  1. Funding and support
  2. Communication
  3. Awareness of progress in other areas
  4. Interest
  5. Timing
Results of the analysis of your gaps in Fish health and disease

- 90 responses with research and expertise gaps provided
- 70 from a purely academic perspective. 20 with policy or industry links
- 62 Institutions and Organisations
Gaps by overarching area

- Immunology
- Host-pathogen interactions (including environment)
- Diagnostics
- Behaviour and Disease (and environment)
- Genetics/Breeding
- Vaccines
- Monitoring/Technology
- Tools/Reagents
- Modelling/Epidemiology
- Disease Specific
- Other
Specific analysis

- Only enough data for basic linkage analysis.
- As expected the top diseases are amoebic gill disease and sea lice in salmon and Viruses for shellfish.
- Proximity analysis of the most common words suggest that the most obvious gaps are:
  - Immunology – the immune response and the gut
  - Shell Fish- resistance and active improvement in all areas
  - Resistance – Genetics and vaccines
  - Vaccines- Mucosal Immune response and effective delivery
  - Pathogens: Environmental interaction of the host and pathogen and genetic resistance/ immunity
Expertise requests

- Omics
- Diagnostics
- Modelling
- Epidemiology
- Technology
- Immunology
- Ecology
- Behaviour
- Other

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Summary

• Disease and health came out as gaps in all our analysis
• Within this area the biggest gaps were:
  • Immunology (particularly mucosal and gut)
  • The role of gut health and nutrition on immune function and health
  • Vaccines – mainly effectiveness and delivery mechanisms
  • Host-pathogen interactions and the environment
  • Genetics and ‘Omics expertise.