

Scottish Salmon Producers' Organisation

Priorities for Science and Research

Marine Scotland
Aquaculture Science & Research Conference
20th October 2009

Priorities for Science and Research

- What is Industry seeking from science and research?
- Collaboration in science and research – some notable successes
- Current industry-sponsored research

Research which is commissioned and supported by industry fairly reflects its priorities

Science & Research - What is Industry seeking?

Observations

- To date, there has been a fair level of collaboration between industry and academia. Where collaboration has worked, this has been reasonably productive in terms of practical benefits.
- If this relationship is to improve, there needs to be a greater focus on finding solutions to the problems we face, rather than on reinforcing the nature of these problems.
- There is a need for a greater focus on areas of practical and commercial relevance to the industry, rather than necessarily the research interests of academics.

Science & Research - What is industry seeking?

- Reports and peer-reviewed publications are often interesting and necessary, especially for academics, but the practical application of the results of well designed research projects is much more important for industry. The end of the project is seldom marked by the production of the final report!
- In some cases, requests for support from industry for large and expensive “projects designed to benefit industry” come in a week or two before an application is submitted, and we need to move beyond this.

Science and Research – What is industry seeking?

- Much earlier engagement is needed to ensure buy-in from industry, and to avoid repeating work already done where the results are sometimes already being implemented

We accept that working on science projects in the farming environment can be difficult, frustrating and less than ideal from a scientific point of view; and that the commercial needs of the fish farmer will always take priority.

Collaboration in Science and Research – Some notable successes

- Furunculosis vaccine development
- Sea louse R&D projects
- Aquaculture LINK

Collaboration in Science and Research

Furunculosis vaccines.

- Furunculosis is a serious bacterial disease of salmonids, caused by *Aeromonas salmonicida*.
- In late '80s and early '90s, the developing salmon industry faced a situation where multiple antibiotic resistant *A.salmonicida* was killing upwards of one third of the fish placed at sea before harvest.
- Industry actively marketed fish of 1-2kg as “*Wee Salmon*” because there was no guarantee that they would survive beyond this size.

Collaboration in Science and Research

Furunculosis vaccines.

- Established collaborative arrangement involving SOAFD FRS, academic departments in Scottish universities, aquatic vaccine manufacturer and industry through SSGA.
- Funded work costing in excess of c.£1m
- Led to the development of efficacious vaccines against furunculosis
- Patented vaccines became commercially available.
- Application of vaccines, coupled with a range of newly developed management practices (inc. farm management agreements involving synchronous production, fallowing, etc.) led to prevention and control of the disease.
- Royalties paid to partners by vaccine developer

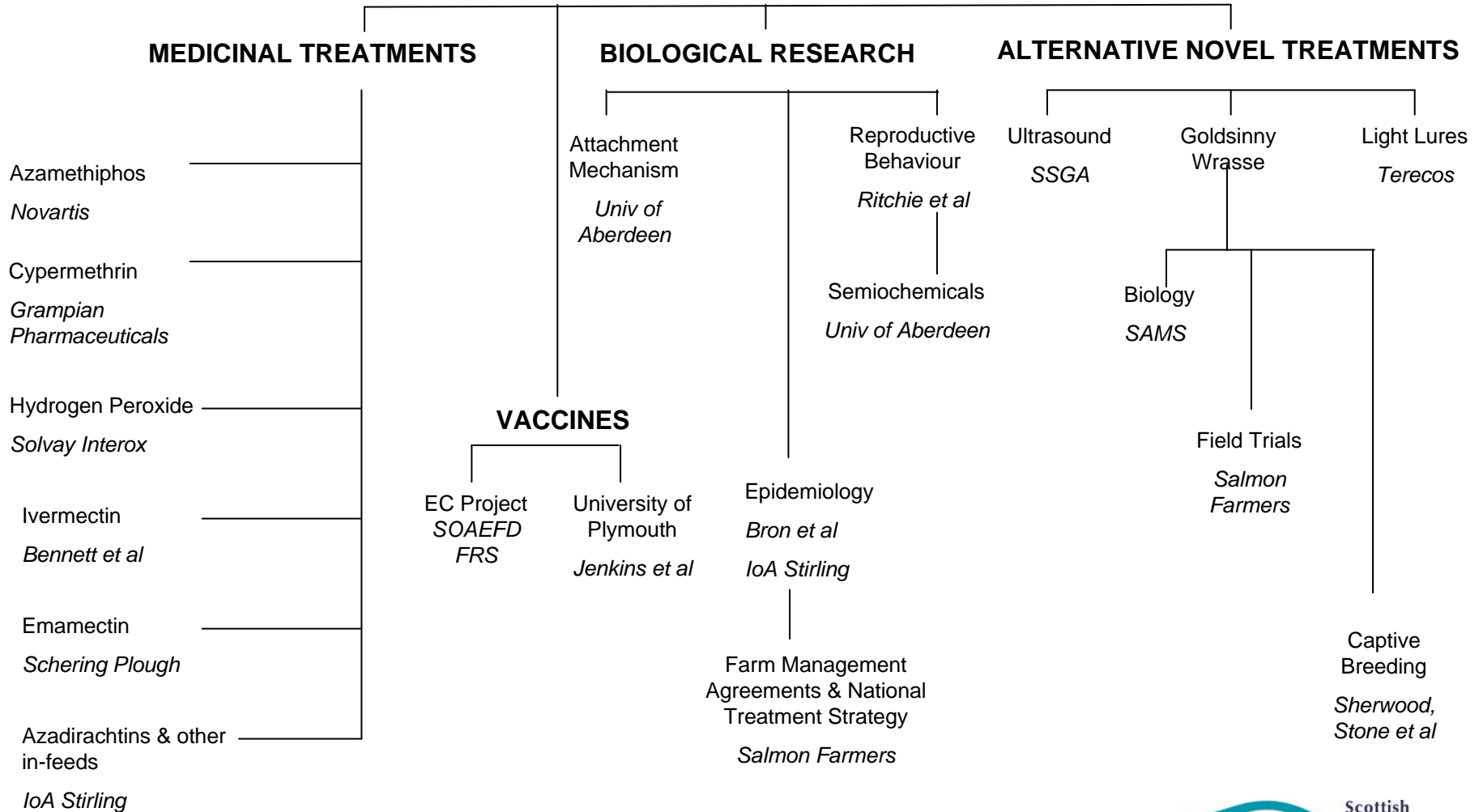
Collaboration in Science and Research

Industry Sea Lice Research Strategy

- 1989 to '98 - supported by a range of partners inc. CE, SOAEFD, HIE, universities, pharmaceutical companies, technology companies. Results subsequently used in the development of the 'National Treatment Strategy for the Control of Sea Lice on Scottish Salmon Farms'.
- Four elements -
 1. Medicines for the treatment of lice on fish
 2. Vaccines to improve immunity to sea lice
 3. Biological research aimed at disrupting the life cycle of sea lice
 4. Novel treatments - Light lures, Ultrasound, Goldsinny wrasse

Collaboration in Science and Research

'89-'98 Sea Lice Strategy



Collaboration in Science and Research

- Aquaculture LINK programme - 1996 onwards. Salmon industry involved in 15 projects, with a total value of c.£2.5m e.g. MMASP project; study of welfare in relation to stocking density and feed withdrawal. Results now being widely applied.
- Post Authorisation Monitoring (Assessment) Programme – examined potential wider ecological effects of the use of approved sea lice treatments
- Various projects covering fish health and welfare, flesh quality (IoA, Stirling), human nutrition esp. n-3 fatty acids and heart health (Prof. Mike Lean, Univ of Glasgow), mitigation of environmental impacts, etc.

Industry Priorities in Science and Research

Today

1. Sea Lice – represent the greatest threat to the health and welfare of farmed salmon and the sustainability of salmon production.
2. Pancreas Disease
3. Environment
4. Other

Industry priorities – Sea Lice

- Serious fish health and welfare issue.
- Can exacerbate other fish health issues.
- Estimated to cost Scottish salmon farmers c.£30m p.a.
- Attracts criticism from wild fish interests and animal welfare organisations.
- Concerns over ability to manage and control with a limited range of tools.
- **The sea lice problem is not going to go away.** There is a need for continued investment to identify and develop effective tools into the foreseeable future.

Industry priorities – Sea Lice

- Sea lice resistance – review of best practice in resistance monitoring (SSPO/ IoA). Support for the current review of the CoGP and the NTS.
- Sea lice treatment – identifying best practice in the use of existing treatments to preserve efficacy and minimise the development of resistance (SSPO / Pharmaceutical companies).
- Zoning - pilot project to assess possible hydrographic connections between Farm Management Areas. Assistance for farming companies involved in the development of Farm Management Agreements.
- New sea lice treatments – support for pharmaceutical companies in identifying, screening and developing new products.

Industry priorities – Sea Lice

- Industry sea lice database – collection, analysis and presentation of sea lice data. Information to be shared by companies within and between Farm Management Areas. Publication of sea lice data by region on SSPO website.
- Wrasse as a biological control – support for trials involving member companies and researchers on captive breeding and the use of wrasse (Corkwing, Cuckoo, Ballan) to reduce the impact of sea lice. Follows earlier industry-sponsored work on Goldsinny wrasse.

Delivery of the results of the foregoing *via* the National Treatment Strategy for the Control of Sea Lice on Scottish Salmon Farms and the industry Code of Good Practice.

Industry priorities – Pancreas Disease

- Serious viral disease of salmon.
- Impacts exacerbated by sea lice and other stressors.
- Estimated that PD accounts for up to 40% of losses to disease/10% of marine salmon production.
- Licensed vaccine available; supply situation continuing to improve.
- Vaccine not a complete solution; integrated approach to PD management remains necessary.

Industry priorities – Pancreas Disease

- Trinations Group – benefits of collaborative approach and shared science, intelligence and experience.
- SARF 015 – aetiology and epidemiology of PD, HSMI and CMS in Scotland
- PD database – SSPO will act as interface between companies and MSS in the gathering and collation of epidemiological data. Data will be the property of SSPO, collected on behalf of its members. Addresses concerns and sensitivities, esp. over possible public access to information.
- Used to help inform companies involved in the development of Farm Management Agreements.
- Cooperation with ISP and others on the prevention and management of PD.

Industry priorities - Environment

- Review of closed containment (VetAqua/loA, Stirling Aquaculture)– to inform MWG Containment sub-group.
- Containment/Escapes prevention/Monitoring – review of net inspection and testing options (SSPO) – to inform MWG Containment sub-group.
- Field assessment of the performance of novel net materials (SSPO/SG/Enviro-net/Dyneema).

Industry priorities - Environment

- Seal predation – Feasibility study on the use of Conditioned Taste Aversion to deter seals at salmon farms (SSPO/SMRU).
- Seal predation – field testing of novel acoustic deterrent device (SSPO/MS/SMRU)
- Seal predation – Assessment of the impact and utility of acoustic deterrent devices (SARF 044)
- Harmful algal blooms – feasibility study of potential measures to mitigate the effects of HABs on farmed salmon (SSPO/Viking AQ)
- Jellyfish – as foregoing

Industry priorities - Environment

- Modelling benthic effects of large scale salmon farms in Scotland (SSPO/SG/CE/SAMS).
- Assessment of the rate of ecosystem recovery following the removal of fish farm cages (SARF 030)
- Modelling the dynamics of carrying capacity / sustainable development (SARF 012a)
- Assessment of the potential to reduce infaunal species list required to give an indication of stress in sediments (SARF042)
- Review of marine EIA thresholds (SARF 040)

Industry Priorities – Other

- Consumer attitudes to feed sustainability (SARF 025) – focus on feed ingredients of marine origin.
- Assessment of evidence that fish farming impacts on tourism (SARF 045)
- Review of the Additional Guarantees for Bacterial Kidney Disease (SSPO/VetAqua/BTA)
- Surveillance of smoked salmon sold in retail outlets for *Listeria monocytogenes* (SSPO)
- Development of guidance on Good Hygiene Practice with particular focus on *Listeria monocytogenes* (SSPO/Salmon smokers)
- Survey of Scottish farmed salmon for anisakid nematodes (SSPO/FSAS/IoA)

Four questions

1. What are the broad research areas the conference should cover, and your research priorities within these?

Fish Health & Welfare; with particular emphasis on Sea Lice and Pancreas Disease

2. How might research into these priorities areas be addressed?

Through well designed and focused collaborative research designed to deliver practical outcomes.

Four questions

3. Are there any barriers which need to be removed to allow the research to progress?

The tendency to compete rather than collaborate

Resistance, in some cases, to engagement with industry in establishing priorities

The focus on final reports and publication in peer-reviewed scientific journals instead of the practical application of results.

Four questions

4. Do you have any concerns about the funding process for research, e.g. who decides what gets funded or how research is funded?

If aquaculture science and research carried out in Scotland is to improve the lot of Scottish aquaculture producers, Industry must be seen as a key player in the establishment of priorities for research designed to improve its efficiency, competitiveness and sustainability.