

BIOTECHNOLOGY AND BIOLOGICAL SCIENCES RESEARCH COUNCIL

CORPORATE POSITION STATEMENT ON AQUACULTURE

This statement summarises BBSRC's corporate position, future direction and priorities in relation to aquaculture research and innovation.

Definition and scope

For the purposes of this document, **Aquaculture** is defined as the farming of aquatic animals and plants. It excludes capture fisheries (catching wild fish from seas or fresh water), although some aquaculture may depend at least in part on feed derived from wild-caught fish.

Aquaculture includes the culture of **algae or other plants** for food or feed, but here excludes algal culture for bioenergy or non-food industrial products¹. However, some research, such as work to increase the productivity of algal culture, would be relevant for both food and non-food uses.

In general, in this document 'fish' should be taken to include shellfish.

Key messages

- BBSRC considers aquaculture to be an important component of addressing the challenges of food security.
- BBSRC wishes to encourage research relevant to aquaculture and build up UK research capacity.
- BBSRC will encourage research in topics including fish health, fish nutrition and improving the sustainability of fish feed, exploitation of genetics and genomics, and human health benefits of eating fish.
- BBSRC will encourage aquaculture-related research, post-graduate training, knowledge exchange, innovation and the translation and exploitation of research for economic and other beneficial impacts in the UK and overseas.
- BBSRC will work in partnership with other funders and stakeholders in the UK and internationally to deliver joint activities relating to aquaculture. The Global Food Security programme is the primary route for developing activities jointly with funders in the UK.

Importance of aquaculture

1. Aquaculture provides an increasing contribution to global food supplies, in particular as a source of protein and important micronutrients which are essential for human health and development. As the global population rises and demand for fish increases, aquaculture will be essential to meet that demand. Aquaculture can help to reduce the demand on land resources for food production and provide highly nutritious food, including for people in low income countries.
2. Aquaculture in the UK is dominated by Atlantic salmon farming, which is mainly located in Scotland, followed by trout farming and shellfish production, which are distributed across the

¹ BBSRC commissioned a report on [Algal research in the UK](#) (BBSRC, 2011) with a focus mainly on (non-food) industrial biotechnology of algae

UK. Globally, fresh-water aquaculture dominates, with Asia by far the largest production region of the world. Major farmed species in Asia include carp and tilapia while warm-water prawn production is expanding. Farming of seaweed is also an important industry in parts of Asia.

3. Aquaculture is an important topic for BBSRC as a component of the Council's strategic priority in [agriculture and food security](#), and with relevance to [human nutrition and health](#). As well as research and post-graduate training, BBSRC interests related to aquaculture cover knowledge exchange and the translation of research into practical application for the aquaculture industry, and public engagement about research and related activities.

Aquaculture research

4. Aquaculture research capability in the UK resides in a relatively small number of universities and government laboratories, while basic biological research underpinning aquaculture is more widely spread. Much of the aquaculture research that BBSRC has supported has been on pests and diseases relevant to the salmon industry.
5. BBSRC investment in recent years has been around £1M per year in research directly related to aquaculture, plus additional funding for underpinning research topics such as basic fish biology and potential novel fish feeds. If BBSRC is to deliver its aims in helping to address UK and global food security, additional research (coupled with other related actions) will be needed.
6. BBSRC will continue to encourage and fund research relevant to a range of types of aquaculture that are important in the UK and worldwide. Given the nature of the value chain for aquaculture, we anticipate that the UK can retain parts of the economic benefit and wider impact from BBSRC-funded aquaculture research, while other aspects of impact from research may be seen primarily overseas.

Actions for BBSRC

7. The interventions that BBSRC will make to enable research and to maximise its impact will be tailored according to the research area concerned. Set within the wider context of BBSRC's strategic priority in agriculture and food security, BBSRC's short- and medium-term actions will focus on: supporting excellent research; collaborative research, knowledge exchange and innovation; international partnerships; skills and training; and public engagement, as set out in the sections below.
8. **Excellent research:** BBSRC's primary role is to generate new knowledge by funding a range of both underpinning research and more targeted research that supports the needs of industry and policy users. BBSRC will aim to increase its funding for aquaculture research. Limited UK research capacity may be a barrier to delivering additional research, and BBSRC will aim to work in partnership to build capability (in both underpinning and more applied research) so that the UK is better equipped to support growth in aquaculture. Where appropriate, we will encourage ambitious programmes of integrated research, typically entailing multidisciplinary collaborations. There is scope for new collaborative work that brings in expertise that has not previously been applied to aquaculture.
9. BBSRC will encourage research in topics including: health and diseases of fish and shellfish (see next paragraph); fish nutrition, including the roles of the microbiome and improving the sustainability of fish feed; exploitation of genetics and genomics for important traits and to increase the diversity of species that are farmed; and the nutritional benefits of fish and fish oil in human diets. In the longer term, research on algae (including seaweed culture) may become a growth area, with important links to non-food uses.

10. For diseases of fish and shellfish (from infection to treatment), BBSRC will particularly encourage research on:
- Mechanisms of infection and spread, including environmental interaction
 - Biology of health and resistance (including gut health and genetic resistance)
 - Immunology of infection and protection, vaccinology
 - Tools and technologies for diagnostics and assessment.
11. **Collaborative research, knowledge exchange and innovation:** BBSRC will encourage continued engagement between researchers and relevant sectors of the industry and other users of research, aiming to ensure that research reflects their needs. BBSRC will promote the uptake of existing mechanisms, including [research and technology clubs](#) with industry, [Industrial Partnership Awards](#) and [LINK](#) funding. BBSRC will encourage and support improved interactions and knowledge exchange between research and user communities to promote the effective translation of research into practical application and help stimulate innovation. BBSRC will continue to work with [Innovate UK](#) (formerly the Technology Strategy Board) and will continue to co-fund aquaculture-relevant projects where appropriate.
12. BBSRC will continue to work closely with NERC, other research councils and other funders to develop joint activities for aquaculture. During 2014-2015, BBSRC and NERC plan to review the aquaculture sector's research needs to see what industry-academic collaborative tools or activities could support those needs. The [Global Food Security programme](#) is the primary route for developing activities jointly with other UK funders.
13. **International partnerships:** BBSRC will work with funding partners in other countries to develop joint activities in topics of mutual interest. We will explore opportunities to network and enhance the diverse national facilities available, by collaborating with and building on European infrastructure networks to widen transnational and virtual access provision, innovation and opportunities for industry partners. In partnership with DFID and relevant overseas governments, BBSRC will develop opportunities to support mutually beneficial research collaborations to underpin the advancement of aquaculture through bilateral and multilateral joint actions that are relevant to the needs of developing countries.
14. **Skills and training:** The supply of suitably skilled staff is clearly important in both academic research and industrial sectors. BBSRC will encourage uptake of training provision available through existing schemes, including those for collaborative training with industry. Through engagement with the aquaculture and related sectors BBSRC will monitor training needs and consider whether additional actions are required in the future.
15. **Public engagement:** aquaculture is associated with several issues of public interest or potential concern, including health benefits of eating fish, animal welfare, environmental impacts and genetic modification. Recognising this public interest, BBSRC will include aquaculture-related topics within its public engagement activities, both individually and in partnership with other funders, for example through the Global Food Security programme.

BBSRC
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