# Australian Barramundi Farmers Association - R&D planning, implementation, extension and utilisation

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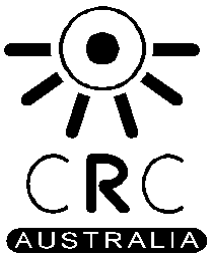
Project No. 2008/915

AUSTRALIAN SEAFOOD COOPERATIVE RESEARCH CENTRE

AUSTRALIAN Barramundi FARMERS ASSOCIATION

*The Australian Seafood CRC is established and supported under the Australian Government's Cooperative Research Centres Programme. Other investors in the CRC are the Fisheries Research and Development Corporation, Seafood CRC company members, and supporting participants*.



# Non-Technical Summary

## 2008/915 – Australian Barramundi Farmers Association - R&D planning, implementation, extension and utilisation

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**OBJECTIVES:**

1. To coordinate the planning, implementation, and reporting of R&D projects conducted by the Seafood CRC to achieve the outcomes specified in the ABFA Strategic Plan.
2. To facilitate the barramundi farming industry participation in Seafood CRC projects and the extension and utilization of the project results, particularly in relation to the development of new products and new markets.
3. To establish, by December 2011, a mechanism by which the ABFA can fund its own R&D coordination and communication activities.

**NON TECHNICAL SUMMARY**

OUTCOMES ACHIEVED

Without this project, the AABFA would not have had the capacity to provide information and essential contacts and support to CRC participants and researchers involved in projects relating to this industry. Especially the capacity of the industry was stretched as a result of floods and cyclones. The resources provided as part of this project enabled research and development to continue as a priority.

The benefits have flowed both ways. Researchers have been provided with the means for effective communication and interaction with the industry and the collection of data. The industry has had the benefit of research better focussed on industry needs and more efficiently targeted. Moreover, the position has helped implementation of research findings – the development part of R&D.

The activities coordinated and the outcomes achieved were:

- Chemical testing of fish to EU export standards.
- Market development
- Water quality and muddy taint
- Flavour profiling
- Purging
- Genetics and a selective breeding program
- Electricity supply
- Animal welfare
- Predator management
- Barramundi production survey
- Flesh colour
- Remote monitoring

**KEYWORDS:** Barramundi

# 1. Introduction

This report summarises all activities undertaken by the Australian Barramundi Farmers Association as part of this project. It provides a draft final report on the total project.

Many of the research activities coordinated with industry as part of this project are CRC projects undertaken by other participants. Details of these will be found in the individual CRC milestone reports.

## 1.1 Need

The Australian barramundi farming sector is a small and growing industry, with the opportunity to sell high quality product at premium prices. Although many aquaculture ventures across Australia have licences to grow barramundi, the industry comprises only 25 ventures that produce barramundi on sufficient scale to regarded as full time enterprises. These businesses have little or no capacity to coordinate investment in, and manage industry development. There is great difficulty in providing a whole of industry perspective on R&D and hence difficulty in capturing the benefits of scale arising from investment in innovation. Collective action on R&D helps capture the benefits of R&D and will deliver future growth.

The ABFA is well positioned with the CRC to implement its strategic plan and to integrate R&D work across all stakeholders under its leadership. However, there is now a need for the ABFA to appoint a person to act as a liaison point with the CRC, to ensure barramundi farmers are involved in the R&D and contribute their resources when required. This person will also facilitate effective communication and coordination with all stakeholders, particularly at the start of projects and in communication of results.

## 1.3 Objectives

1. To coordinate the planning, implementation, and reporting of R&D projects conducted by the Seafood CRC to achieve the outcomes specified in the ABFA Strategic Plan.
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# 2. Methods

The ABFA appointed Mr Graham Dalton as a Research and Extension Manager (REM) to conduct this project as the project principal investigator. The REM was responsible for all aspects of the project, including promoting the project to barramundi farmers throughout Australia to get their 'buy-in'.

The REM was assisted by the ABFA R&D Committee members from each State to facilitate industry participation in Seafood CRC projects by conducting communication and extension activities with the nominated R&D providers.
The tasks of the REM included:

- Preparation of agreed work plans
- Establish administrative arrangements

- Promotion of the carriage of priority R&D tasks by the industry.
- Facilitation of the genetics review project.
- Building links with R&D providers
- Seeking additional funding for R&D

# 3. Results

**EU Testing Program**

For some years the ABFA has sponsored a program of testing industry product against the EU requirements seafood imported to the EU. This is rigorous and has stood industry in very good stead when quality issues arise. It proves environmental and operational qualities are high.

Most members are participating. It is now forming one of the marketing planks being developed as part of the repositioning project undertaken with the CRC.

**Market Development Project**

Sunshine Coast University and the CRC have been key partners into research examining how to improve the market position of Australian farmed barramundi.

This has provided much more detail about the perceptions and market position of barramundi. Consumer surveys clearly demonstrate the strong brand recognition for barramundi. But, they also demonstrated the need to do much more about actually marketing in a way that delivered a reasonable decent price.

Key elements of the project have been:

- **Research with Consumers**
  A detailed survey of consumer understanding and preference was undertaken. It provided solid data relevant to the construction of marketing campaigns.

- **Chefs/suppliers** –Research has been undertaken with chefs/suppliers in Melbourne, Darwin, Perth and Sydney. Topics covered include perceptions/knowledge re farmed barramundi, how chefs choose suppliers, factors that influence their choice and sources of information they use.

- **Recipe cards** – ABFA is now considering a trial use of recipe cards

- **Working with fish merchants/mongers** – An experiment is currently being undertaken to assess the impact of in-store tastings and branding on sales of Australian farmed barramundi. An initial series of tastings have been undertaken with unbranded product that is simply sold as Australian farmed barramundi at one outlet in Noosa. A second series of tastings was planned to occur with a branded product supported by point of sale information. The results are yet to be disseminated.

- **Launch of EMS** – A group of three Public Relations students at the Sunshine Coast University will work on planning, organising and running an event to launch the EMS as part of their studies in Semester 2 this year.

**Water Quality**

Water quality is critical for land based farms for two reasons. First, discharge is monitored for environmental impacts. There is a lot of pressure from the

environmental regulators to develop technologies that reduce nutrient loads. ABFA is now working with other groups to support R&D into this issue.

Secondly, water quality is a vital part of ensuring the flavour of barramundi delivers the outstanding eating experience expected by consumers buying Australian fresh barramundi. ABFA is working with DEEDI to start finding ways to manage algae growth in ponds which has a major impact in producing off flavours. This is an important issue forming part of branding and marketing.

**Flavour Profiling**
As part of the industry's drive to improve the flavour quality of barramundi, ABFA has worked on the CRC funded project to develop a more objective approach to geosmin off flavours that can appear in barramundi.

This remains something of a subjective assessment. But a workshop in Cairns organised by ABFA for the researchers to present the results demonstrated that consistency of grading can be achieved.

The Management Committee has approved a systematic approach to flavour testing. This will be rolled out during the 2012 ½ year workshop and will form an essential part of the industry's "green tick" approval system. This is very much an example of research being directly applied in industry as result of the project.

**Purging**
Despite the best of water management techniques (still to be developed), a land based producer still runs a risk of developing off flavours that mean the product should not be at market. As an adjunct to the water quality project, the ABFA has agreed to fund a post graduate student $10,000 directly from ABFA funds to explore the development of protocols for purging so that fish can rapidly be returned to market ready condition.

**Genetics and a Selective Breeding Program**
For the last few years, developing a program for genetic selection of farmed barramundi has been both a major goal and a major hurdle for the ABFA.

CRC funds have been vital to getting this started. This has involved research into the business model and the economic benefits of a selective breeding program,

The company, Barratek is basically controlled by industry. It is not for profit. It will be having its first formal board meeting in the next few weeks. Key issues to be managed now are:

- Where to locate stock
- Employment of the geneticists
- Involvement of state government agencies
- Fund raising.

It will be some years before industry sees enough gains for the project to be self funding. It will need governments to recognise that this is important and that assistance until it is sustainable is necessary.

**Electricity Supply**
For many of producers, electricity is a major in put cost. It is not getting any cheaper. ABFA has been looking at the services of power supply brokers. It will be up to members to decide if such services are commercially worthwhile.

ABFA is also undertaking bench marking use in order to provide some leads about effective cost management.

ABFA is also supporting research into biological approaches to reducing the need for physical aeration.

**Animal Welfare**
The industry is increasingly under pressure to justify the use of ice slurries and there is also a question about the effect on flesh quality. ABFA is supporting research into looking at the use of electrical stunning for barramundi. ABFA R&D Committee Chair, Mr Bob Richards is directly representing ABFA on this issue given its long term importance to the image of barramundi in the market.

**Predator Management**
In conjunction with the Queensland aquaculture industry, the ABFA was successful in persuading the regulatory agencies to introduce access to three year permits for management of predator birds. This required the development of integrated farm management plans for predator management. These bring together a range of effective techniques for managing predator birds.

The industry is now trying to develop a system for dealing with problem crocodiles that end up in ponds. This is a serious OH&S issue for farmers, farm workers and farm families. Research into management strategies will be required.

**Production Survey**
After receiving an FRDC grant to develop an independent survey and forecast of production, ABFA engaged world class consultants KPMG to develop the survey and conduct the first round.

It was disappointing to report that it proved impossible to persuade the industry to provide sufficient survey data to provide complete results. As members are not supporting the survey, the Management Committee made the decision to discontinue work on the survey.

**Flesh colour**
The colour of filets can vary enormously, from pink to white, light grey and sometimes quite dark grey. It appears to have little bearing on flavour, but the feedback is that it is influencing consumer decisions at point of sale.

Anecdotally, it seems to be related to many factors including water quality, sunlight, age, stress and probably diet.

ABFA has supported research to be undertaken by Curtin University into these factors.

**Chemical Testing of Imports**
ABFA sought funding from a number of sources including the CRC to test the quality of imported barramundi against the EU suite of tests - standards the Australian industry meets. Industry argued that it needed to know where it stood compared with its biggest competitors – imports from Asia.

Despite a strong bid, funding was not made available. In this case, ABFA funded the project from its own resources.

**Remote Monitoring**
Following an R&D workshop organised for the Queensland aquaculture industry by DEEDI, the Department has offered to fund an on farm trial of remote monitoring equipment. Industry is particularly interested in monitoring dissolved oxygen. It is essential to the health of the animals, but producing high DO represents one of the biggest costs for farmers. Optimising the levels with regards to costs will deliver financial benefits. There will be an open day for farmers to see what can be done with this kind of system.

# 4. Discussion

The ABFA has had a clear set of research priorities that are directly attuned to addressing profitability issues. However, as a relatively small industry, geographically dispersed and with diverse production technologies, it has always been very difficult to coordinate these R&D priorities properly. The industry had few mechanisms nor the resources to undertake the key tasks of:

- Raising the industry R&D funds
- Identifying the issues
- Prioritising the research effort,
- Liaising with the research providers,
- Coordinating with industry,
- Disseminating the findings
- Working with the research results to deliver improved industry performance (ie – implementation)

The industry believes the benefits of the project have been significant. This project has enabled this new and emerging industry to participate in a sophisticated R&D program.

Without attempting to quantify the benefits, the industry believes that the benefits have been very substantial and will have greatly exceeded the investment.

# 5. Benefits and Adoption

This project had the following objectives:

To coordinate the planning, implementation, and reporting of R&D projects conducted by the Seafood CRC to achieve the outcomes specified in the ABFA Strategic Plan.

- This was achieved. The results were outstanding in that all the CRC projects involving ABFA were carried through. This would not have happened in the absence of the project grant.
- Moreover, the ABFA was able to undertake a number of additional and complimentary R&D tasks outside the immediate CRC program. These have been listed in the body of this report.

To facilitate the barramundi farming industry participation in Seafood CRC projects and the extension and utilization of the project results, particularly in relation to the development of new products and new markets.

- The ABFA was an active participant in the CRC. This would have been difficult in the absence of this project.
- In addition to the ABFA priorities, the CRC engaged in research activities of multi-sector benefit. These included the master-class workshops. The barramundi industry participated in many of these.
- The focus of these, and most of the CRC research priorities for the barramundi industry were targeted at improving market penetration.

To establish, by December 2011, a mechanism by which the ABFA can fund its own R&D coordination and communication activities.

- This remains problematical. Participation in the CRC already requires the full commitment of the available funds of the ABFA.
- Also, damage to many farms in north Queensland arising from cyclone Yasi and flooding has reduced the immediate capacity of industry to fund longer term development.
- In the interim, the ABFA will direct the priorities of the Executive Officer to CRC research projects. It is expected that within 18 months some of the R&D contributions by industry can be re-directed to this objective.

# 6. Further Development

Each of the projects being undertaken by the ABFA and CRC require ongoing implementation. The details of these will be found in the individual reports for those projects.

However, the ABFA is committing the resources of the organisation and its Executive Officer to managing all research projects to a conclusion, and then to the implementation of the results.

This should continue the industry's drive to improve product quality, drive down costs and improve market penetration.

It is worth noting that the program covered major research projects with long lead times and up to a decade before full benefits from implementation are realised. It is because of the scale and the difficulty of individual commercial commitments to this kind of broad industry research that the CRC was created and then supported by the ABFA.

**The Performance Indicators for the Project were:**

1. The projects outlined in the ABFA Strategic Plan are implemented and there is a high level of participation in the projects by the barramundi farming industry.
   This is still underway, but the high priority projects are all being undertaken with a substantial commitment of resources and a high participation level.
2. The above projects deliver their specified out puts to the industry
   This will not be measurable until late 2012-2013 as research into particularly water quality will not be completed and implemented until then.
   The genetic selection program will take several generations of barramundi before enhanced performance is demonstrable.

3. The dollar value of funding available for barramundi farming R&D, both from the seafood CRC and other sources.
   Funding for R&D has been increasing yearly. To date, nearly all ABFA funds are allocated through the CRC. But additional discretionary funds are increasing. On completion of the CRC term, the ABFA will have significant funds to allocate to R&D. The Association expects to undertake a fresh review of all R&D priorities to decide how best to allocate these resources.

4. The levels of industry and stakeholder awareness of development opportunities.
   Development, particularly in the key State of Queensland, is constrained more by the environmental restrictions imposed by the Federal government. Recent requirements that coastal aquaculture in effect deliver zero discharge are a major hurdle.
   The industry is committed to reducing nutrient discharge levels, but in the foreseeable future, zero discharge from salt water production systems will be not possible.
   The industry believes that development opportunities will largely be confined to more intensive production from existing systems. The genetic selection program will be a significant step towards achieving this.

5. That the ABFA established a better self-funding mechanism
   The ABFA has now established satisfactory funding mechanisms for all R&D commitments.
   There still remains a need to develop better funding mechanisms for industry promotion and for political and policy analysis.

# 7. Planned Outcomes

**Planned Outcomes and Benefits**

The project achieved the planned outcomes and the benefits are becoming more obvious to the industry participants. The project assisted the ABFA address many of the major challenges specified in the FRDC funded ABFA Strategic Plan. In particular:

Value Chain Management

1. Greater involvement with industry stakeholders (particularly supply chain)
   This objective is starting to be addressed. Specifically, the completion of quality audits and a marketing program will draw the full production and sales chain into a common approach.
2. Cooperative sales, processing and distribution networks
   Industry cooperation still needs to be encouraged. Many producers remain ruggedly individualistic with a strong belief in stand- alone marketing. However, most producers are now cooperating on a range of common benefit activities including testing to EU standards, flavor specification and branding of environmental achievements.

Sustainability

1. Implementation of sustainability reporting, collective and/or individual, coordinated and tied with industry promotions.
   This outcome is closer to achievement with audit standards for sustainability near completion and a common awareness and marketing program under development.

Technology Transfer and Innovation.

1. Zero waste through water discharge;

At present, it is not possible other than in fresh water recirculation systems for producers to have zero waste discharge.
The industry, however, is committed to reducing nutrient discharge levels and is funding research on managing water quality.

2. Reliable supplies of high quality juveniles;
   The genetic selection program managed as part of this project is close to commencement after many years of consideration and analysis. The ABFA has formed "Barratek", a not for profit company to undertake the breeding program.
3. Reduced fishmeal use, without compromising feed performance.
   This challenge has now been left to the feed companies which have global resources committed to this outcome.
   But, the indications are that this is being achieved, with barramundi now passing the key milestone of delivering a kilo of high value fish for each kilo of fishmeal in the diet.
4. Reduced input costs and improved farm efficiency/productivity.
   Benchmarking studies as part of the EMS accreditation have been undertaken. Most large producers are participating.
   In particular, the key measure of energy inputs and associated carbon foot print is being measured. This is going to be a vital part of the industry response to the carbon tax.
5. Greater cooperation to innovate and adopt technologies
   It has not been possible to quantify "cooperation". Perhaps the completion of this project might be regarded as one proxy measure. But, more can be done.

Marketing and Added Value

1. Raised consumer awareness of the product and industry
   The ABFA has made market development a major part of this project. The research conducted as part of the "re-positioning" of barramundi demonstrated that consumer awareness of barramundi is positive and high.
   The focus for the industry has now moved towards differentiating Australian farmed barramundi from the much cheaper imported fish. The EMS is a vital part of this project.
2. Consistent quality and taste
   A major focus of this project has been coordinating and funding research into water quality – a key factor in the some what inconsistent taste of barramundi.
   This project funding enabled workshops with R&D providers and industry aimed at establishing bench marks for flavour and for testing flavor.
   It is intended to implement these as part of the audited quality standards being developed.

People Development and Cooperation

1. Develop leadership in the industry
   It has not been possible to focus on this challenge within this project other than to encourage industry participation in appropriate training and development opportunities as they arise.
2. Increased grower cooperation and participation in industry development
   It has not been possible to focus specifically on this challenge. However, the shared responsibilities of implementing the R&D program have undoubtedly facilitated this result.

**Flow Of Benefits**

In the application the flow on benefits were allocated amongst the States as follows.
NSW 5.00

NT 10.00
QLD 65.00
SA 10.00
WA 10.00
**Sub Total: 100.00**

The structure and location of the industry has not changed over the project period other than short to medium term impacts in Queensland arising from cyclone Yasi. The allocation estimated remains appropriate.

***Public Benefit Outcomes***

As the core R&D programs coordinated as part of this project are still in early phase of implementation, it has not been possible to calculate and apportion public/private benefits.

The best quantification of the flow of benefits will be to sum the allocation of the individual programs as they are estimated.

However, public benefits encompass:

- the more stable regional industry,
- the capacity to measure carbon footprints and reduce them,
- the reduction in environmental impacts,
- better understanding of consumer preferences and a capacity to meet consumer expectations,
- development of an improved genetically selected breeding animal available to all producers,
- development of the R&D capability of public institutions involved in the program.

***Private Benefit Outcomes***

As the projects coordinated as part of this grant are still in early implementation, the private benefits are yet to be quantified. But they encompass:

- an Australian industry better able to match imported product,
- consistency of quality,
- better prices,
- a more robust and profitable industry.

# 8. Conclusion

This project has demonstrated the high returns from an investment in coordinating industry and the research providers. The project has facilitated a better understanding of industry requirements amongst the research institutions, a better understanding in industry of the capabilities of the researchers, and the development of fora to facilitate dialogue regarding research processes and results.

Most importantly, the funded position has enabled the allocation of a significant amount of the ABFA's resources towards practical implementation of R&D. In the eyes of industry, too many research projects result in a publication, a conference paper, and that is where it ends. The funding of industry to work with the researchers

on dissemination of the results and implementation of the finding has been invaluable.

If there is one conclusion and recommendation from this project, it is that there should be a portion of all R&D project funding specifically allocated to the industry/research provider interface.