

# Final Report

## Product Quality Standards, Specifications and a Product Quality Management Framework to Facilitate Market Expansion of Farmed Barramundi

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**Australian  
Barramundi  
Farmers  
Association**



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## 1.0 NON TECHNICAL SUMMARY

<b>2002/404</b>	<b>Product Quality Standards, Specifications and a Product Quality Management Framework to Facilitate Market Expansion of Farmed Barramundi</b>
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**PRINCIPAL INVESTIGATOR:** Mr Carl Young

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### **OBJECTIVES:**

1. Develop industry agreed product quality standards
2. Develop industry agreed product specifications
3. Canvass the support for an industry quality label
4. Outline options for a management system that would validate the industry label.

### **NON TECHNICAL SUMMARY:**

**(Please note: this report should be read, and the the contained standards applied, with special reference to the the ABFA Code of Practice and relevent State government food safety standards. The Code of Practice can be obtained from ABFA)**

### **OUTCOMES ACHIEVED TO DATE**

Increased grower appreciation of the need to address quality issues in the industry. A better understanding of quality issues.

Improved minimum standard across the industry, fewer complaints about the quality of product in the Australian market.

It is difficult to determine whether the standards have contributed to holding the price of barramundi however it is notable that the price of barramundi has remained buoyant at around \$7.80 per kg during 2003/04.

There has been serious consideration of the establishment of a quality mark or label. The possibility of adopting a mark in the future is possible and the issue remains an ongoing item on the ABFA agenda

Wholesalers and retailers are expressing increased confidence in farmed barramundi, also investors and existing farmers are confident and the industry continues to grow rapidly relative to the rest of the Australian aquaculture industry.

It has been recognised that production from the Australian farmed barramundi industry will rise sharply over the next three years. Production is likely to rise to around 4000 tonnes by 2005/06. There will be significant expansion from existing operations particularly in Queensland, Northern Territory, and WA as well as new operations in NSW and Victoria.

The standards cover size, grading, fish condition, flavour, packing and labelling of fresh whole fish and do not cover processed fish, fillets or frozen product. They do not incorporate fish colour.

An objective of this project was to explore the opportunities and options for the introduction of an Association label or mark that would formally identify that a member was producing products that conformed to a set of agreed standards. The label would differentiate the product from other non-accredited product.

The ABFA determined that a label would have to be based on auditable certification and the benefits (profit) from implementing and administering a certification program would have to be worthwhile. It was considered premature to introduce an industry backed accreditation scheme to support the Standards at this point in time, however this position is to be reviewed regularly. It was agreed that the standards should be implemented and promoted to ensure industry wide adoption

The ABFA Executive formally agreed to adopt the quality standards and the product specifications and initiate a three-year quality program to assess and, where appropriate, implement an accreditation scheme and adopt a quality label.

**KEY WORDS: Barramundi, Quality, Standards, Aquaculture**

## **2.0 ACKNOWLEDGMENTS**

Financial support for this investigation was provided through the Seafood Industry Development Fund Administered by Seafood Services Australia. Nick Ruello of Ruello and Associates was a co-investigator.

## **3.0 BACKGROUND**

The Seafood Services Australia SIDF Project 2002/404 has been undertaken over a four year period. The consultative process was designed to obtain industry participation in promotion, marketing and improving product quality.

Industry members attending the ABFA annual conference in Townsville in July 2000 identified promotion, marketing, increased supplies vs. demand, and variable product quality to be the major issues facing the development of the industry.

Marketing was the major topic of discussion at the subsequent half-yearly workshop in Cairns in February 2001. As a result, the Association organised a marketing workshop in May 2001 at which selected seafood marketing experts and industry formulated a marketing and promotions strategy. It was identified that consistent quality was required to underpin the successful promotion (and expansion) of the industry.

The results of the May 2001 marketing workshop were then presented to the ABFA membership at the annual conference in Cairns in August 2001. As a result, a suite of marketing and promotions projects were developed to help address the price declines associated with increased supply. The ABFA funded a number of projects including a year long series of marketing and promotional activities, research to address off-flavours, and the establishment of quality standards. The ABFA also agreed to contract the services of a dedicated part-time executive officer.

The Association first undertook to obtain industry feedback on the possible adoption of product standards at the ABFA half yearly workshop and general meeting in Cairns in March 2002. The Executive received support for the concept and investigated options for possible standards. The Executive Officer the external consultant then drafted the standards, which were assessed in detail at a workshop held during the Prawn and Barramundi Conference in August 2002.

Meanwhile, the ABFA Executive Officer submitted a proposal for funding to SSA to undertake the current project. The application was approved for funding through the SSA Seafood Industry Development Fund and the project was formally started in October 2002. In October 2002 two workshops were held with farmers and prospective farmers in Perth and Adelaide to obtain industry wide input to the project. Further, input was received from other industry stakeholders such as wholesalers, retailers and restaurateurs in Sydney, Brisbane and Melbourne.

An interim project progress meeting was held during an ABFA Executive teleconference in November 2002. It was agreed to hold a workshop in conjunction with the general meeting in Cairns in February 2003 to finalise the project and at this meeting the standards were formally adopted.

The standards were then reviewed at the ABFA Annual General Meeting and workshop in Cairns in August 2004. The current standards outlined in this document reflect significant changes to the original standards adopted in 2003. The standards remain a priority issue for the ABFA and will continue to be discussed and refined and the industry develops.

### **3.1 Industry Issues – Industry Structure and Product Profile**

A range of industry issues had to be taken into consideration during the project. These issues were important as they influenced the scope of the project, the level of industry adoption of the standards, and the support for the introduction of a label.

#### **3.1.1 Industry Structure**

The structure of the farmed barramundi industry has changed very little over a number of years. The Association is primarily made up of members from Queensland, two from the Northern Territory and one from Western Australia. These farmers produce fish in fresh or saltwater ponds, or in marine or freshwater cages. Well over 80% of Australia's farmed barramundi production by volume comes from these farms. Almost half of production now comes from two farms and it is likely that the proportion produced by these larger producers will increase significantly in the near future. The bulk of the remaining production is produced from medium sized operations (50 – 350 tonnes) again located in Queensland, Northern Territory, and WA.

However there are three significant operations located in South Australia and one in New South Wales. Most of these farms are not Association members and produce fish in recirculation systems or in one case in a tank based flow through system using geothermal ground water. A large number of licences have been issued for barramundi farming; well over 150 in Queensland alone. Many of these are not producing or only producing a very small amount of fish. A significant number of small operators throughout the country are not members of the ABFA.

The structure of the industry is such that there are a wide variety of operators with a range of skills, differing business objectives, varying financial support, and production efficiency. The profitability of barramundi operations varies greatly.

The need to sell product quickly to address cash flow problems has been the most likely cause of sub-standard fish being sold in the past. These fish are generally “dumped” onto the Sydney Fish Market. It is often the new farms, those operated by inexperienced staff, or those that are inefficient or marginally profitable that sell substandard fish. The sale of these fish does have a detrimental impact on the industry. Not surprisingly many of these operators have not been members of the ABFA therefore they are the most difficult to communicate with and are reluctant to participate in generic activities.

Other issues that are facing the industry include increasing volumes of imported fish such as basa, Nile perch and barramundi. This tends to drive down the price of local product.

### **3.1.2 Product Profile**

The larger producers, and many of the medium sized non-recirculation producers, now produce fish of over 2 or 3 kilograms. One grower in particular has invested heavily in processing and value adding and is selling mainly portion size fillets through the major multiple retailers (e.g. Coles & Woolworths).

The smaller producers, recirculation operators and newcomers to the industry are producing many of the plate-sized fish. This is predominantly sold as whole, head-on. Many of the large and medium sized producers have developed or are developing company brands and have addressed quality and safety issues.

Industry participants are at very different stages of commercial development and business maturity; ranging from long established operators with sophisticated management and quality procedures to small and new entrants with few documented procedures. Consequently, individual operators canvassed during this project expressed widely differing views on the way in which the standards should be developed and what should be included.

## **4.0 NEED**

Production from the Australian farmed barramundi industry is forecast to rise sharply over the next three years. Production rose from less than 2500 tonnes during 2002/03 to about 2800 tonnes in 2003/04 and is forecast by the ABFA to exceed 3600 tonnes in 2004/05. The estimates from the ABFA survey of members is that production will rise to over 4000 by 2006/07 as expansion of existing operations in



Queensland, and new operations in the Northern Territory, NSW, Victoria and WA, come on line.

Barramundi has enjoyed relatively high market prices in the past and is considered a premium fish. It is an ideal candidate for tropical aquaculture and can be produced in saltwater and freshwater. It is now successfully grown in fresh and saltwater ponds, cages systems in marine, estuarine and in freshwater locations, in recirculation tank and pond systems, and in flow through tank systems using geothermal water and concrete raceways using seawater. In fact barramundi is now commercially grown in every mainland State in Australia.

As the supply of barramundi increases the market price has fallen. It has been identified by farmers that there is a need to address this pressure on price. To date there has been very little coordinated generic marketing activity by the farmed barramundi industry. Also, it should be noted that there has been very little individual promotional activity by farmers. The Association members are convinced of the benefits of undertaking targeted generic promotional activity based on consistent, specified quality produce.

The need to address falling prices with increased supply is not a situation that is unique to farmed barramundi but translates across the entire aquaculture industry, particularly in other aquaculture sectors experiencing rapid growth. Very few aquaculture industries in Australia have done anything to address the situation in a coordinated manner.

In order to underpin an effective generic market promotions campaign the industry identified that it needed to address the high variability in quality of the product being sold. The high variability in quality of farmed barramundi in the market occurs for a number of reasons. For example, highly varying production procedures, handling and processing techniques, a lack of understanding and expertise, a lack of willingness to address quality, and importantly, a lack of coordination across the industry. This project seeks to address these issues by setting minimum quality and specification standards.

It was identified at the ABFA Marketing Workshop in 2001 that in order to effectively undertake generic promotion there must be consistent or minimum quality standards right across the industry. Also, it was identified that individual marketing effort would benefit from a minimum standard being achieved. As a result of this project a set of standards were developed and adopted by ABFA members.

The opportunities and options for the establishment of a barramundi "label" were assessed. Labels or producer logos have been used effectively to brand or differentiate product in many industries to improve market share. The establishment of a label or logo by the ABFA that could be used by producers that conform with the standards was investigated. The additional profit and long-term competitiveness of Association members through the adoption of a label was also considered. The project looked at the US farmed catfish industry as a model.

## **5.0 OBJECTIVES**

1. Develop industry agreed product quality and safety standards
2. Develop industry agreed product specifications

3. Canvass the support for an industry quality label
4. Outline options for a management system that would validate the industry label.

## **6.0 METHODS**

### **6.1 The Workshops and Consultation Process**

Various workshops were undertaken during this project. The workshop objectives were to:

- Provide local barramundi farmers, regardless of whether they were members of the ABFA or not, with an opportunity to identify appropriate quality standards based on their mode of operation and market requirements. Nick Ruello of Ruello & Associates and Carl Young of the ABFA facilitated the workshops.
- Determine and/or engender support for the adoption of the product quality standards
- Identify the manner in which the standards would be adopted; and
- Solicit support for the ABFA.

The outputs of the workshops and consultation is provided in the Results and Discussion section, following is the feedback from the workshops:

- The standards should address variability of product quality across the industry;
- The industry must adopt the standards or industry specifications;
- Important product parameters such as taste must be included in the standards;
- The process should identify the additional benefits that could accrue to industry as a result of adoption of the standards including increase financial returns;
- Standards must be easy to apply, easy to understand and provide creditable information to industry and purchasers.

### **6.2 Extension Phase**

The standards developed during this project have been and continue to be widely distributed throughout the industry. The extension of the project outputs is an ongoing process. The standards were most recently reviewed at the ABFA AGM and workshop in Cairns 2004. Additionally, the adoption of a label was considered. The following section details the most recent version of the Standards. Any changes to the standards will be distributed throughout the industry in a similar manner to that outlined in the project extension plan.

## 7.0 RESULTS AND DISCUSSION – ABFA QUALITY STANDARDS

The specification categories that make up the grades and the standard of the parameters in each of the categories were developed over the initial 20 months of the project. These were presented to the industry at a workshop in Cairns in March 2003. The most recent change has been to adopt a single rather than dual standard. This is summarised in the following sections of the report.

### 7.1 ABFA Quality Standards and Product Specifications

#### 7.1.1 Introduction

Product definitions, specifications and tolerances for a single standard grade were prepared for farmed barramundi in conjunction with farmers.

The standard focuses on size grading, fish condition, flavour, packing and labelling of fresh whole fish and do not cover processed fish, fillets or frozen product. It does not incorporate fish colour because while highly variable, the colour of barramundi rarely creates any problems in product marketing.

The specifications are recommended to barramundi growers for field trial in their business. The specifications are open to further discussion even though they have been accepted and endorsed by the ABFA. They are intended as a first step and not “set in concrete” and are best considered as interim specifications that will continue to be reviewed at future meetings of the ABFA, and amended as needed.

The standard grade product specifications detailed below is intended to facilitate trade, especially for newcomers to the barramundi farming industry; they do not prevent growers selling ungraded fish, in terms of quality or size, or according to a private agreement with customers, as long as the fish are safe to eat and satisfy relevant government requirements.

The **ABFA Standard Grade** is designed for fish that meet quality standards and stringent packing specifications.

The standard is summarised in **Table 1** below.

At this stage, adherence to the specifications and quality grades is voluntary, it is for guidance only, and does not prevent growers from selling fish of exceptionally good quality or fish meeting even tighter specifications to their customers under their own brand.

Farmers often produce fish of exceptional quality or pack to particular specifications that may warrant a price premium however there is as yet no consensus on the criteria required to define a “premium grade” in the industry. Farmers may nevertheless seek a price premium when they feel the product quality and market conditions are such that it is appropriate to do so. The criteria required to establish a “premium grade” will be reconsidered as the standard is reviewed.

While the aim of the project is to improve fish quality and safety growers utilising the ABFA quality standard and product specifications can still pack fish of several size categories or different quality grades in the one container if they choose to do so, as long as this is clearly indicated on the pack.

Table 1:  
**ABFA Quality Standard and Product Specifications  
Summary Table**

<b>Feature</b>	<b>Specification</b>	<b>Standard Quality Grade</b>
<b>Size</b>	<b>400 – 600</b>	No more than two fish out of grade per case and fish within 50g of specifications.
	<b>600-800</b>	No more than one fish out of grade per case and within 60g of specifications.
	<b>800 -1000</b>	No more than one fish out of grade per case and within 80g of specification
	<b>1+, 2+ &amp; 3+</b>	Nil tolerance out of grade.
<b>Flavour/ Taste</b>		No obvious earthy or other undesirable flavour permitted.
<b>Smell</b>		Fish has no obvious smell.  No offensive or spoilage odour evident.
<b>Physical Deformities</b>	<b>All size categories</b>	None present
<b>Scale Loss or Skin Damage</b>	<b>Size: 400-600</b>	No obvious scale loss/skin damage on more than 2 fish per case.
	<b>Size 600-800</b>	: No obvious scale loss/damage on more than 1 fish per case.
	<b>Size 800-1000</b>	No obvious scale loss/damage on more than 1 fish per case.
	<b>Sizes 1+, 2+ &amp; 3+:</b>	Nil tolerance on obvious scale loss/damage on fish.

<b>Fish Packing</b>	<b>Sizes less than 1kg</b>	Finger packed.
	<b>Larger sizes</b>	May be “jumble packed”
<b>Harvest Date Marking</b>		All packs are marked with the harvest date and packing date.

### 7.1.2 Food Safety Requirements

All state and commonwealth food safety and animal welfare requirements are to be met during the rearing, harvesting, chilling, packing and the transport of all packs or bulk shipments of products.

All premises, plant and equipment including ice and the packaging materials must comply with all government requirements and all necessary information on producer's identity and address is shown on all shipments. The Food Standards Australia New Zealand website [www.foodstandards.gov.au](http://www.foodstandards.gov.au) is a good source of information on food premises and food standards generally.

Growers should be familiar with the current requirements of the food safety agency in their state as well as those in the states where the fish is sold; these requirements can easily be checked via the web sites of these agencies. The Seafood Services Australia website [www.seafoodservices.com.au](http://www.seafoodservices.com.au) is also recommended for related information and links.

Sick or moribund fish are not permitted to be packed for sale for human consumption nor are fish with obvious spoilage odours.

### 7.1.3 Terminology

**CASE:** Common styrene case holding around 15-18 kg of fish, the tolerances for out-of-grade on smaller or larger packs are to be adjusted according to pack weight.

**PHYSICAL DEFORMITY:** Curved backbone, shortened, compacted tail or eroded tail, where there is no sign of infection or microbiological activity.

**SCALE LOSS AND SKIN DAMAGE:** Physical damage arising from gill net and loss in handling but it does not include damage due to infections or microbiological activity.

### 7.1.4 Size Grades and Grading

The following size categories and weight range have been determined by industry representatives and endorsed by the ABFA after consultation with growers and distributors of farmed barramundi. The aim of this standardised size grading scheme

is to facilitate trade by helping customers and consumers buy the size classes they desire with as much certainty as possible.

The size categories for fish packed as Standard Quality Grade are shown in **Table 2**. These categories and associated tolerances (**Table 3**) were agreed upon to facilitate trade by providing buyers with size assured grading.

Table 2:  
**Size Categories**

<b>Weight Range</b>
400-600
600-800
800g-1.0 kg
1-2 kg
2-3 kg
3+ kg

Table 3:  
**Size Standard**

<b>Feature</b>	<b>Standard Quality Grade</b>
<b>Size Grading</b>	<p>Size 400-600: No more than two fish out of grade per case and fish within 50g of specifications.</p> <p>Sizes 600-800 &amp; 800-1000: No more than one fish out of grade per case and within 60 and 80g respectively of specifications.</p> <p>Sizes 1+, 2+ &amp; 3+ &amp; up: Nil tolerance out of grade.</p>

Growers may continue to pack fish of more than one size grade within a pack and then mark the count on the packaging or a label; it would be appropriate to categorise these as ungraded. Likewise, growers may pack two contiguous size grades together in one container and then specify the two size grades on the label.

## 7.1.5 Flavour And Taste

### 7.1.5.1 Causes of Flavour Variation <sup>1</sup>

The flavour and taste of fish is highly variable and any assessment likely to be very subjective: Each person will have a different assessment of the fish and a different tolerance to any earthy flavour gained from naturally occurring compounds present in the culture system.

The earthy, muddy or musty flavour and related odours in wild and farmed fish are commonly due to odorous compounds absorbed across the gills and passing into flesh via the bloodstream. These compounds are **not** dangerous to humans, the compounds have leached into the water from microalgae (various species of cyanobacteria and actinomycetes) growing in the ponds, particularly after they have died and decomposed. Cyanobacteria are mostly responsible, while species or strains of actinomycetes are of lesser importance.

Two chemical compounds commonly implicated in freshwater aquaculture off-flavours are geosmin and methylisoborneol (MIB). These have been identified as a significant issue in catfish farms in the USA; they are concentrated in the livers and in the fatty tissue.

Cyanobacteria that produce geosmin or MIB are widely found in nutrient rich environments on farms or natural ponds, especially those with elevated phosphorus.

Geosmin and MIB are potent and only have to be present in very small concentrations to be detected by humans. But humans differ greatly in their sensitivity and so there is a great difference in the detection threshold between trained persons and the typical fish consumer for these compounds. Sensory threshold concentrations for these chemicals also vary from fish species to species.

The more sensitive person is therefore more competent as an “official taster” on a farm but the “acceptable level” of earthy flavour varies with customer and so it needs to be discussed and agreed upon with customers.

The best way to deal with flavour problems is to avoid them by managing the phytoplankton community in the water to keep down the species that produce it. It should also be noted that purging does not necessarily remove all undesirable flavours; the results of purging are variable and so purged fish too need to be checked for flavour before sale.

Note fatter fish or larger fish may have accumulated more MIB or geosmin than lean or small fish. The uptake of these chemical compounds is temperature related, they are quickly absorbed and concentrated in warm weather. Note also that uptake is far quicker than release during purging. The purging times therefore needs to be extended in colder weather and with fatter fish

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<sup>1</sup> Adapted from CS Tucker. Off flavour problems in aquaculture. Reviews in Fisheries Science 8 (1) : 45-88. 2000

The accept/reject level of earthy flavour should be determined after repeated fish tasting and consultation with customers as to their particular requirements because different customers and consumers have different preferences.

It is advisable to test at least two fish from each pond/tank about a week before harvest and then again the day before harvest to see that it is still satisfactory. A simple taste testing protocol is provided below.

It is advisable to train at least one person on the farm to be the “official taster”. People with a more sensitive palate are best suited to this task even though it is necessary to seek feedback on the flavour of the fish from each of your customers regularly in order to be confident in the testing procedures and flavour assessment.

#### **7.1.5.2 Taste Testing Protocol**

The harvesting conditions, fish preparation, cooking, and tasting should be standardised or kept as uniform as possible from one tasting session to another.

Use a clean room or tasting area with no prevailing or background smell. No smoking should be permitted one hour before tasting. No eating 15 minutes before tasting. No tasting should be conducted on a full or an empty stomach.

Harvest in the same manner each time i.e. seine, gill net or scoop net.

Kill and chill fish in a standard manner e.g. in an ice slurry (approximately 2 hours) before removing a sample of flesh from the same part of the sample fish each time. Scale the fish and cut off fillets (leave skin on).

A 1cm wide slice or “finger” from the front edge of the fillet (including dorsal and ventral part) or from the lower belly meat will suffice without ruining the fillet for other use, but select the same sampling site every time. For sensitive customers, testing of the belly meat is recommended because it is fattier and stronger flavoured.

The fish finger should be fully wrapped in “baking paper” and cooked in a microwave oven for about 15-20 seconds on a high setting. Fish should be allowed to “rest” inside the paper for 30 seconds before unwrapping one end to smell the escaping steam and odours.

The fish finger is tasted by rolling all around the mouth and chewed but only a tiny portion needs to be swallowed, most can be spat out. The acceptance/rejection level or grading of earthy flavour is determined according to the customer’s directions or market requirements.

Clear the nose and rinse the mouth with water between samples; allow several minutes between the samples.



Table 4:  
**Taste Standard**

<b>Feature</b>	<b>Standard Quality Grade</b>
<b>Flavour/taste</b>	No obvious earthy or other undesirable flavour permitted.

#### **7.1.6 Odour**

Freshly harvested fish from clean waters have no noticeable smell and this is the specification selected for Standard Quality Grade. Fish with some unusual smell or a light spoilage odour can be marketed, but spoiled fish with obvious spoilage odours should not be sold for human consumption.

Fish found dead in ponds or rearing tanks should not be sold.

Table 5:  
**Odour Standard**

<b>Feature</b>	<b>Standard Quality Grade</b>
<b>Smell</b>	Fish has no obvious smell.  No offensive or spoilage odour evident.

#### **7.1.7 Physical Deformity**

Fish with physical deformities such as curved backbone, deformed jaw, shortened, compacted, eroded or misshaped tail, where there is no sign of infection or microbiological activity, may not be attractive but are still capable of providing a satisfying meal and are therefore suitable for sale. However, for marketing purposes, it is preferable that these fish be sold as filets.

Only one deformed fish per pack is permitted in the typical styrene case of the small size categories for a Standard Quality Grade but there is a nil tolerance of deformities in the large size grades. Cases with more than the specified number of deformed fish should be graded and labelled appropriately.

Table 6:  
**Deformity Standard**

Feature	Standard Quality Grade
<b>Physical Deformities</b>	Sizes 400-600 : No more than one fish with minor physical deformity per case. 600 – 800 No more than one fish with minor physical deformity per case. 800 - 1000: No more than one fish with minor physical deformity per case. Larger sizes: No significant deformities.

#### **7.1.8 Scale Loss or Skin Damage**

Extensive scale loss or skin damage due to harvest or handling also impairs the appearance and value of fish but such fish are nevertheless safe to eat and are allowed for sale. A specified small number of damaged fish are tolerated in Standard quality grade as listed in Table 7.

Any fish with signs of infection or obvious microbiological activity on the skin should not be sold, but should be disposed of with care.

Table 7:  
**Scale Loss and Skin Damage Standard**

Feature	Standard Quality Grade
<b>Scale Loss or Skin Damage</b>	Size 400 - 600: No obvious scale loss/skin damage on more than 2 fish per case.  Sizes 600-800 & 800-1000: No obvious scale loss/damage on more than 1 fish per case.  Sizes 1+, 2+ & 3+: Nil tolerance on obvious scale loss/damage on fish.

### 7.1.9 Fish Packing

There is now ample evidence that close attention to packing and the use of single use styrene or cardboard cases creates a stronger market image and helps to enhance fish quality and price.

“Finger packing” where the fish are individually placed in the case side by side with belly down and dorsal surface upwards is required for small fish in the Standard Quality Grade whereas a simple “jumble pack” where the cases are filled without attention to packing layout is acceptable for larger fish.

Table 8:  
**Fish Packing Standard**

Feature	Standard Quality Grade
<b>Fish Packing</b>	Sizes < 1 kg: Finger packed.  Larger sizes may be “jumble packed”

### 7.1.10 Harvest Date And Labelling on Packaging

ABFA policy is that Date Of Harvesting and packing date and all information on the producer and product recall required by government agencies is to be marked on each case or bulk container packed. This date marking practice ensures that all users are aware of the date the fish were harvested and thereby enables them to better manage stock rotation and maximise eating quality of the fish.

Food Standards Australia New Zealand (FSANZ) recently issued a small guide to writing a food recall plan and conducting a food recall. Copies of this “Food Industry Recall Protocol” booklet are available gratis by contacting FSANZ by phone on 02 62712241 or email [info@foodstandards.gov.au](mailto:info@foodstandards.gov.au). The recall protocol can be downloaded from the FSANZ website at <http://www.foodstandards.gov.au/recallssurveillance/foodindustryrecallpr1819.cfm>

Table 9:  
**Labelling Standard**

Feature	Standard Quality Grade
<b>Harvest Date Marking</b>	All packs are marked with the harvest date and packing date.

## 8.0 RESULTS AND DISCUSSION – ASSOCIATION LABEL

### 8.1 Industry Specifications and Quality Schemes

There are a number of proprietary and auditable business and quality management systems currently available to barramundi farmers. Some are solely business process management systems and some are dedicated quality and safety management systems. There are proprietary systems that integrate HACCP and ISO.

ISO 9002 is a quality system for the company rather than a quality standard for the products and services it produces and sells. HACCP is a food safety management system.

*In summary, a quality system consist of:*

- 1. Documented product standards that clearly show what is to be supplied*
- 2. Clear procedures for important operations*
- 3. Checks at different stages to make sure the product will meet specifications*
- 4. Training to make sure staff members know their job*
- 5. Auditing to give customers confidence that they will get what they expect.*

The ABFA recognises the importance of addressing quality management across the industry, most producers have implemented a quality management system based on HACCP. The standard developed in this project combined with the industry Post Harvest Handling Code of Practice provide Association members and others an excellent framework to help implement their preferred on farm quality system. By adopting the standards in support of their HACCP program the quality of farmed barramundi across Australia will become increasingly consistent.

### 8.2 Post Harvest Handling – Code of Practice

The ABFA Post Harvest Handling Code of Practice of 1998 is a set of guidelines developed to guide farmers in the harvesting, packing and distribution of farmed barramundi so that they can consistently deliver safe, prime quality product to customers.

Adoption of the Code is not mandatory but it is recommended by the ABFA.

The Code describes the ***general procedures and principles*** to be followed for achieving the best practice standards and covers:

- Government requirements for food safety;
- Responsibilities of management and staff;
- Hygienic working environment;
- Processing aims and principles for key tasks and a guide to how these key tasks can be undertaken.

The Code of Practice is not a detailed prescriptive manual setting out exactly how each processing task should be carried out because there is usually more than one way to safely and efficiently undertake any particular activity.

Each farm has different facilities and staffing and therefore selects the most appropriate manner and/or equipment to undertake each individual task and achieve *best practice* while respecting all food and processing-plant hygiene standards.

The adoption of the Code of Practice was promoted throughout the industry and intended to provide a commercial advantage to members as more and more companies and markets seek seafood suppliers who can demonstrate documented quality management systems. It was recognised that once the FSANZ reforms on food safety are implemented it will be compulsory for all food businesses to have a HACCP based food safety program and recall procedures.

The Code of Practice has now been in place across the industry since 1998 and many producers have used it to establish on-farm quality systems. The development of industry standards is intended to complement the code.

### **8.3 Industry Quality Accreditation, Labelling and Branding**

One of the objectives of this project was to explore the opportunities and options for the introduction of an Association logo or label that could formally identify that the producer was producing products that conformed with a set of standards. In effect this label would differentiate the product from other non-accredited product. It was quickly identified by the ABFA that a label would have to be based on auditable certification and the benefits to the farmer in the form of increased profit from implementing and administering a certification program would have to be worthwhile.

Industry wide certification is not common in aquaculture industries. One of the most notable examples of successful certification appears in the US farmed catfish industry. Here the processors carry a certification issued by the Catfish Institute. The Catfish Institute (TCI) is an association of catfish farmers, processors, and feed manufacturers, it is a non-profit corporation that derives its revenues from member feed mill dues.

All processors affiliated with TCI carry the seal on their product, indicating that both the catfish farmer and processor meet the “highest” quality standards and pass the inspections required by the U.S. government.

Processors must meet the following criteria set by TCI in order to be included on the Certified Processor list:

1. Be located in the U.S. and be listed on the monthly USDA/NASS "Catfish Processing Report;"
2. Process grain-fed channel catfish, farm-raised in the USA and delivered live to the processing plant;
3. Be (a) listed on the "USDC Approved List of Fish Establishments and Products" or (b) submit evidence to TCI that a HACCP plan is in place that conforms to FDA established guidelines; and
4. Receive the majority of live fish from farms which use feed products from TCI Member Feed Mills.

The "U.S. Farm-Raised Catfish" seal was introduced to ensure customers know they are purchasing product from certified processors and therefore purchasing "a premium product with a superior taste, and to differentiate U.S. Farm-Raised Catfish from imported fish, such as Vietnamese Basa, that does not meet the same strict quality guidelines".

Interestingly the "stringent quality controls adhered to by these processors include taste-testing at the farm before harvesting and again at the processing plant before the fish are unloaded to "ensure that consumers receive a premium product with superior flavour".

As of November 9, 2002, 18 catfish processors (representing more than 90 percent of U.S. Farm-Raised Catfish production) are represented on TCI's Certified Processor list. The collective processing capacity of these processing plants is around 4500 tonnes each week.

In conclusion, it would appear that one of the primary reasons for the establishment of the "U.S. Farm-Raised Catfish" seal was to differentiate US produced catfish from Asian imports. There are many other differences between the Australian farmed barramundi industry and the US farmed catfish industry, not least of all volume of production and a lack of vertically integrated operations. A primary objective of the ABFA is not to differentiate Australian farmed barramundi from hostile competition at this stage but ensure that all products produced in Australia meet a certain quality standard.

#### **8.4 ABFA Quality Assurance Program Development and Accreditation**

Individual barramundi farmers have identified the need to develop their own brands in order to differentiate their product from their competition. The consensus of the Association Executive was that it was premature to introduce an industry backed accreditation scheme to support the standards prepared during this project at this point in time, however this position is to be reviewed regularly. It was agreed that the standards should be implemented and promoted to ensure industry wide voluntary adoption. The following section outlines the rationale for the Association's position:

The ABFA Executive examined various means of improving product quality and implementing a quality assurance accreditation program during this project. The estimated set up and recurrent costs involved in implementing a program (Refer to **Table 10**) were considered to be beyond the means of both the Association and individual members at this time. Particularly while the ABFA and many growers' income was still limited.

It was felt that an unaudited or self regulated quality assurance program would have little value in the market place and that there would be little support from members for an independent third party audited system while the economic benefits of such a program were not clear. It was estimated that the auditing costs for the individual farmer would exceed \$1000 per annum (for a scheduled and an unscheduled audit per year). This was considered to be too costly.

Research with buyers of fish indicated that there was very little likelihood of gaining a price premium for fish with an ABFA quality assurance logo in the short or mid term. It would appear that the adoption of some quality assurance program, accreditation and label would only confer some marketing advantage over the long term if the majority of farmers were part of a scheme and non participants were perceived as having inferior product.

Even a modest royalty payment or fee of several cents per kilogram to participate in a quality assurance logo scheme was considered unattractive to farmers at this time particularly as many are suffering from the impact of drought (Feb 2003).

The ABFA have formally adopted the updates to the quality standards on a number of occasions and have committed to regularly review the implementation of a quality program, accreditation and adoption of an industry label.

### **8.5 ABFA Quality Program, Labelling and Accreditation Implementation Plan**

A three year plan to review the standards and a quality label was adopted by the ABFA at the Cairns 2003 meeting:

1. **Year 1** - Promote the adoption of the ABFA quality standards and product specifications over the next 12 months to growers and barramundi buyers then review and amend the standards and specifications as needed.
2. **Year 2** - Utilise the amended standards and specifications and further promote adoption by existing members and non members. Examine the costs and benefits of adopting a third party audited quality assurance program whereby audited and certified members use an ABFA quality logo. (Explore the options of sponsorship, royalty or licensing fees, availability of government support and the likelihood of attracting a premium price for quality assured fish).
3. **Year 3** – Further examine funding options for implementing a third party quality assurance and ABFA labelling program.

Table 10

**Preliminary Costing of an industry funded quality assurance program with third party auditing.**

<b>Set up cost item</b>	<b>Recurrent costs</b>
Development of program, rules of management, audit and compliance, penalties etc. with the assistance of a consultant. Select and brief an auditing company.	Review of program, annually
Design and print certificates and logo	Issue certificates and maintain current register
Set up of members register	Compliance costs
Initial media launch and publicity	Ongoing publicity and promotion to create and enhance value of the logo
	Maintain a contact desk for management and promotion of the program
Estimated cost \$40-50,000	Estimated cost \$35000+ pa

**9.0 BENEFITS AND ADOPTION**

The ABFA has formally adopted the standards and members have been using the standards to set product quality. Detailed feedback on the standards will continue to be collated and reviewed by the industry at the half yearly and annual meetings.

This being the case, the industry is likely to benefit from an overall improvement in the quality of whole fish entering the market. The market price of farmed barramundi has been stable and relatively buoyant for most of 2003 and is forecast to increase slightly during 2004. There are a number of reasons for this. An overall improvement in product quality resulting from the implementation of HACCP and adoption of minimum quality standards may be contributing to the price stability. The impact of the standards on market price will be considered when the standards are reviewed. However it appears that wholesalers, retailers and the food service sector are becoming increasingly confident in farmed barramundi.



## **10.0 FURTHER DEVELOPMENT**

It is appropriate that the standards developed during this project are implemented, tested and reviewed by the industry. The industry is growing quickly and the structure of the industry changing. Fewer producers are marketing greater volumes of product in a variety of forms as the industry grows. There are fewer new entrants to the industry and the larger producers are undertaking more individual marketing, selling directly to customers more product that satisfies their specific requirements.

## **11.0 PLANNED OUTCOMES**

It is likely that the project outputs have contributed toward the achievement the outcomes outlined in the project application. The industry is experiencing price stability despite an increase in the volume of product being sold by farmers. There are a number of factors responsible for this however the overall quality of farmed barramundi in the market is improving and with this wholesaler, retailer, and consumer confidence. Undoubtedly farmers are increasingly aware of the need to produce good quality product and now do so consistently.

## **12.0 CONCLUSIONS**

The Association determined that formal adoption of an industry backed, accredited quality program was premature given the size and structure of the industry, the costs of establishment and ongoing operation of the program, and the benefits that would accrue to producers through increased revenue from sales.

The industry represented by the ABFA is currently very optimistic about the future market potential for farmed barramundi. However, the number of producers in the Australian barramundi industry is relatively small and, with two notable exceptions, producers are operating relatively small businesses in a pioneering industry on a shoestring.

Consequently income to the ABFA is limited and there are many pressures on the industry through the ABFA to fund government lobbying, research and marketing projects. For these reasons the ABFA have endorsed a measured approach to the formal adoption of the Standards.