Operation of

Seafood Services Australia

Technical Information and Advice

Stephen J. Thrower
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SEAFOOD SERVICES
AUSTRALIA

FISHERIES
RESEARCH &
DEVELOPMENT
CORPORATION

Project No. 2000/240

Operation of Seafood Services Australia : Technical Information And Advice

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OBJECTIVES

1. To provide the seafood industry and companies & agencies supporting the industry with information that is timely, current, relevant and in a form that is readily applicable to their needs.
2. To actively encourage the dissemination and application of research findings and other material for the benefit of the seafood industry.

   Activities will include:

   a) Distribution of research reports, books, manuals etc.

   b) Production and distribution of the Australian Seafood Industry Directory.

   c) Maintenance of a multi-function web site on seafood technology.
3. To carry out advisory and consultancy work that will assist industry with problems encountered in either every day operations or developing new initiatives.
4. Common objective with NSC, to provide industry with networking to researchers, government agencies and other industry participants in both Australia and overseas, and so identify areas where research is needed and the people capable of doing that research.
5. Common objective with NSC, to integrate and develop the services of SSA (initially SeaQual Australia, AUSEAS and NSC) as a single point of contact delivering cost effective, appropriate and timely assistance to the seafood industry.

NON-TECHNICAL SUMMARY

OUTCOMES ACHIEVED

1. The promotion of Seafood Services Australia (SSA) and its services has continued during the life of this project. This has resulted in a more informed seafood industry. Initiatives that have achieved this include:
   - Participation in SSA activities such as the Australian Fish Names Committee
   - Promotion of Seafood Services Australia at targeted trades shows and industry workshops;
   - Preparation of articles about the activities and capabilities of Seafood Services Australia for industry journals.
   - Participation in meetings of the SSA network.

2. The functions previously fulfilled by the Australian Seafood Extension and Advisory Service (AUSEAS) and the National Seafood Centre (NSC) were aligned in preparation for incorporation into the SSA Limited entity. The function, which was previously offered by the NSC, has been incorporated into SSA as the Seafood Industry Development Fund (SIDF).
3. Information is now delivered to clients in a more efficient and effective manner. This has been achieved through:
    - The delivery of more rapid response to requests for information, as opposed to the lengthy and time consuming information packs. This suits the requirements of the clients and reflects the changing needs of the industry;
    - An ever-increasing expansion of the knowledge base of information that we have at our fingertips;
    - The preparation of 51 Draft Advisory Notes (Seafood Bytes) which will be web-enabled by SSA;
    - Presentation of technical papers to a wide range of industry forums and workshops;
    - Preparation of training materials to meet the needs of the specific clients.
4. A web page has been developed on the Seafood Services Australia Limited web site. The web page that was previously hosted on the Qld Department of Primary Industries web site has been discontinued.
5. Promotion and sales of post-harvest reports from FRDC and NSC has been maintained.
6. The Australian Seafood Industry Directory (2001) has been completed and is available in both hard copy and CD based versions.
7. Networks between researchers industry and government agencies involved in the development of the seafood industry have continued to be developed and encouraged. This can be seen through participation rates in the SSA network

KEYWORDS

SSA, Seafood Services Australia, technical information, dissemination, technical advice delivery, technology transfer, extension.

ACKNOWLEDGEMENTS

The FRDC and DPI Queensland have provided joint funding for an information and advisory service on seafood for over ten years. Special thanks and recognition are due to Peter Dundas-Smith for his unwavering support in the form of ideas, encouragement, and funding, often in the face of strong opposition.

Support has also been strong from the three directors of the DPI's food research program. Special mention should be made of Rosemary Clarkson for her assistance in drafting the business plan, which laid the basis for AUSEAS development.

AUSEAS has relied upon the various teams at the Centre for Food Technology for technical support. These have included the Library, Seafood R&D, Rural Industry Business Services, Analytical Services, and Product and Processes Development.

There has been some good support from our friends and clients in the seafood industry and the agencies and private sector entities that support it. Exchange of knowledge between AUSEAS staff and technical and marketing consultants, scientists, engineers etc. has benefited all parties, and ensured that our clients get good, reliable information.

The development of Seafood Services Australia Ltd has ensured that post-harvest concerns have a secure place in the decisions of government. This has been brought about by dedicated efforts of the staff of its three component parts, AUSEAS, NSC, and SeaQual.

BACKGROUND

Seafood Services Australia (SSA) was formed as the result of the merging of three FRDC funded post harvest projects,

- AUSEAS (Australian Seafood Extension and Advisory Service);
- NSC (National Seafood Centre); and
- SeaQual.

These three diverse activities were merged as a single entity during the life of this project, which has since been funded as a single project.

Of these three funded projects, AUSEAS is the longest established, having been in existence in a variety of forms since 1982 and funded by FRDC or its predecessor, the FIRC, since 1987 (see Appendix 3. Page 18)

The mission of AUSEAS as outlined in the AUSEAS Business Plan (Thrower, 1993) was:

> *To provide the seafood industry with a comprehensive extension service on post-harvest seafood technology, and thus facilitate the adoption of leading edge technology that is timely and appropriate.*

A consultancy conducted by MOJO Australia Pty Ltd and SCP Fisheries Consultants, outlined a national strategy for the Australian seafood industry. (ASIC, 1993). The report listed a number of key "planks" for the development, which included:

- Strengthening the profile and self-image of industry and promoting its image to Government and the community;
- Raising the quality of the product and the process and ensuring quality standards;
- Implementing a system of product identification to identity type, origin, and quality criteria;
- Developing a market focus, replacing supply with market demands as the driver for industry's activities; and

- Fostering a more information orientated culture and structure for the development of efficient information networks.

Over the years, AUSEAS has taken on a diverse range of activities, but its core business has continued to be "to interpret and disseminate the results of post harvest-research and development to industry". The scope of information and advisory services gradually widened to encompass the full range of post-harvest needs.

At the commencement of this current project, SSA had developed as a single point of contact for the three individually funded components:

- Technical Information and Advice;
- Product and Process Development;
- Food Safety Quality Management and Standards

The primary focus of this current project (2000/240) has been to fully integrate the activities of AUSEAS into SSA whilst still continuing to provide its core services to industry.

NEED

An overarching need addressed in this project was to incorporate the Technical Information function into Seafood Services Australia together with the SeaQual and National Seafood Centre functions in preparation for the formation of Seafood Services Australia Limited.

Two of the major challenges confronting the Australian Seafood Industry at the commencement of this project were:

- To cope with the limitations to its wild fisheries that are near or at full exploitation, and
- To adapt to the changing preferences and expectations of the marketplace.

A further need became evident during the life of this project. That was to assist the industry to meet its food safety obligations, particularly through areas such as the identification of relevant risks in their operations.

The seafood market is truly global, and overseas competitors are threatening Australia's position as a supplier of high quality seafood.

Many Australian exporters have attempted, with some success, to change from supplying bulk commodity markets to servicing smaller, more lucrative niche markets with specialised requirements. Trade liberalisation will further expand the demand for highly priced, value added products, probably incorporating a significant service component. To take advantage of these opportunities, Australian producers need knowledge of markets, processes, products, presentation, and standards for safety and quality.

Specific areas of need are:

- Exploratory material on new ventures, processes and products.
- Referrals to key service providers for seafood producers.
- Trouble shooting when problems occur.
- Advice and assistance in preparing proposals for funding assistance.
- Provision of a "one stop shop" for the seafood industry's information needs.
- Networking between industry, researchers, and government agencies.

To cater for the diverse levels of educational understanding and backgrounds of its clients, SSA-TIA uses a variety of techniques in answering inquiries, each intended to facilitate the uptake of advice offered to the client.

OBJECTIVES

The key objectives of this project were:

1. To provide the seafood industry and companies & agencies supporting the industry with information that is timely, current, relevant and in a form that is readily applicable to their needs.
2. To actively encourage the dissemination and application of research findings and other material for the benefit of the seafood industry. Activities will include:
    a. Distribution of research reports, books, manuals etc.
    b. Production and distribution of the Australian Seafood Industry Directory.
    c. Maintenance of a multi-function web site on seafood technology.
3. To carry out advisory and consultancy work that will assist industry with problems encountered in both every day operations and in developing new initiatives.
4. Common objective with NSC, to provide industry with networking to researchers, government agencies and other industry participants in both Australia and overseas, and so identify areas where research is needed and the people capable of doing that research.
5. Common objective with NSC, to integrate and develop the services of SSA (initially SeaQual Australia, AUSEAS and NSC) as a single point of contact delivering cost effective, appropriate and timely assistance to the seafood industry.

METHODS

The client base of AUSEAS has always been very diverse, ranging from fishers to financiers, and including groups such as processors, marketers, freight forwarders, lawyers, doctors and insurance assessors. Over the duration of the ten years operation of the advisory service, and especially in the last three, there has been a marked change in the nature of the inquiries, from more general topics such as "How do I set up a fish smoking operation?" to inquiries of a much more specific nature.

With the imposition of HACCP based food safety and quality assurance systems, the industry has become more knowledgeable and sophisticated in articulating its information needs.

In concert with these changes, the mode of response to these enquiries has changed from the provision of printed information packages taking several days, even weeks, to very rapid delivery of highly specific information using telephone, fax and E-mail. SSA is now accessible for the cost of a local call using a toll free number (1300 130 321). There has been a progressive increase in traffic, as this number becomes more widely known and publicised throughout the industry.

The use of e-mail, a rarity three years ago, is now a common method of communication within the industry.

RESOURCES

A prime objective of AUSEAS has always been to provide a world-class extension and advisory service to the seafood industry and the agencies and companies that support it. To accomplish this, SSA-TIA staff have access to a formidable array of resources, which include:

- An in-house database on all aspects of seafood technology.

- The most comprehensive library on seafood in Australia held on site at the DPI Centre for Food Technology (CFT);
- Access to the wider DPI library, with holdings which are currently valued at $8 million in real terms;
- Linkages to technical libraries of organisations such as the Divisions of CSIRO, other research institutes, government agencies, universities, and private companies, both nationally and internationally;
- Subscriptions to a very extensive range of global electronic databases, both web and CD based.
- Our own database of global expertise in seafood technology.
- Access to the knowledge and experience of over 70 food scientists and technologists at CFT specialising in food safety and quality, product and process development, food analysis, and research and development.
- A corporate knowledge developed over many years through practical experience.

COMMUNICATION AND EXTENSION

AUSEAS staff has been active participants in a number of targeted promotional activities.

- SSA raises the profile of seafood by regularly exhibiting at key food industry trade shows including "Fine Food", "International Catering Fair", and various seafood festivals.
- Presentations supporting a number of aquaculture industry sectors including oysters, red claw, prawns and barramundi;
- Participation in meetings and activities of the SSA network;
- Publication of topical articles in magazines and newsletters, notably Seafood Australia, R&D News, and other state based publications.

INFORMATION AND ADVISORY SERVICES

As noted above, the provision of information and advice on a one on one basis has always been central to AUSEAS operations. The main method of delivery was the compilation of a literature package of specialist articles and interpretive material selected to meet the specific needs of the client. This earned revenue that was used to defray the costs of searches, postage etc.

Gradually the nature of the demand has changed. There is still a demand for written data on markets, regulations etc., but increasingly, very specific technical advice is needed, often in oral form, as the client lacks the time, or sometimes the level of sophistication, to use technical articles. In short, the demand is for knowledge, not information.

A series of leaflets called *Seafood Bytes*, which cover a very large range of topics in seafood technology, has been developed for future access from the SSA web site. These provide a brief summary of the topic and refer the reader on to more detailed literature. They are intended to be a first response, providing an introduction to the topic.

DATABASES

Maintenance of the existing AUSEAS databases has continued. Both continued entry of literature references and a large volume of material from the Internet have expanded the bibliographic database of technical information. The database of global expertise has also been maintained.

The database that underpins the Australian Seafood Industry Directory has been maintained and the 2001 edition has been published in both hard copy and electronic form.

It was decided not to proceed with an independent database of funding sources. Instead, links to the range of very extensive databases set up on the web by the Commonwealth and State governments will be set up on the SSA web site.

More recently, the Commonwealth Government "GrantsLINK[1]" web site performs this service. GrantsLINK is a gateway to suitable and relevant grants for community projects from the many Commonwealth programs that are available.

WEB SITE

SSA has continued to have an internet presence with web pages as part of the QDPI web site.

Development of an independent SSA Technical Information and Advice web site was abandoned in favour of the establishment of a single SSA web site. This delayed the process of development, and changed the range of services offered. Ideally in time, this site will incorporate access to the AUSEAS databases and an interactive chat line addressing the problems of the Australian industry.

RESULTS / DISCUSSION

The results of a project such as this may best be served by considering each of the planned outcomes as listed in the original application and progress made towards these outcomes.

OUTCOME 1

An increased awareness of SSA and its services through promotion, cross selling, and an industry workshop. *(Milestone 01 Jul 01 a)*

- This awareness has certainly increased, largely through the development of the SSA network. SSA network meetings have been held approximately three times per year and are spread around most states.
- Meetings of the SSA network, and our participation in Seafood Directions 2001 have replaced the proposed industry workshop.
- Participation in a range of broader SSA activities such as the Australian Fish Names Committee and the drafting of the Australian Seafood Standard have also helped to raise the profile of SSA.
- SSA promotion at targeted trades shows and industry fairs/festivals;
- SSA participation in a wide range of industry meetings and workshops such as:
    - The Silver Perch Growers Association;
    - Australian Prawn Farmers Association;
    - Australian Barramundi Farmers Association;
    - Oyster Growers Associations (NSW and South Australia);
    - Queensland Freshwater Crayfish Growers Association;
    - Aquaculture Association of Queensland;
    - Australian Institute of Export;
    - QCCI; networking function;
    - DPI Information Supermarket Annual Conferences

[1] http://www.grantslink.gov.au/getting_started/

- Queensland Warmwater Aquaculture Conference;
- Seminar on e-commerce for seafood.

OUTCOME 2

Closer alignment of AUSEAS and the NSC in preparation for incorporation into SSA Limited.

- AUSEAS and NSC have both been successfully incorporated into SSA.
- The NSC functions have been incorporated into SSA as the Seafood Industry Development Fund (SIDF);
- Limited circulation of a questionnaire to selected recipients of NSC projects has been completed, and the results reported on in the final report of that project.
- There has been no analysis of existing demands for services of both NSC and AUSEAS. No review or workshop of activities of AUSEAS and the NSC involving staff, stakeholders and members of the NSCAC has been held.

OUTCOME 3

The delivery of detailed information to clients more efficiently and effectively.

Software

The software used in developing databases used is Db Text. This was selected because it is comparatively non-structured and therefore very flexible in operation. It can accept information from many different sources and is used by many professions that require a flexible database format such as legal services.

Material stored takes many forms including standard bibliographic format directing the user to material held on site in hard copy form, abstracted material taken from searches of electronic databases, discussions taken from exchanges on numerous chat lines, correspondence with experts, website addresses, contact details for various experts, and photographs.

Boolean searching a number of different fields including titles, authors, publication years, abstracts full text, and key words can retrieve this material with considerable precision. We have found the keywords that we enter particularly useful, enabling us to highlight information that although not the primary focus of a paper, was nevertheless very important for our client

Operation of the database may best be illustrated by an example. A major petfood manufacturer was buying large quantities of small pelagic fish that occasionally contained a small puffer fish. Would the canning process destroy the toxin? One of our databases is simply a listing of the contents pages of all the reference books in the CFT library. Searching this with the descriptors *tetrodotoxin, can*,* and *stability,* revealed that the toxin could indeed survive the process, and had in fact done so causing a the death of a person eating canned sardines. This search took approximately 5 minutes.

Delivery Mechanisms

As noted above under Methods, there has been a trend in the demand for services away from the literature package in favour of very fast-targeted knowledge transfer. This has had a number of effects.

- The number of orders for detailed information packs has reduced.
- Clients are now demanding rapid, often on-line answers to their specific problems i.e. they are looking for very targeted advice, not detailed information.

- A summary list of subjects of enquiries is attached to this document. (See Appendix 5.). The breadth of the enquiries covered is a reflection of the very diverse nature of our client base, our penetration through all levels of the industry and the community in general, and the amount and diversity of knowledge that we needed to have at our disposal to meet these requests. (See also Outcome 1).
- Draft copies of 51 Advisory Notes (Seafood Bytes) have been passed to SSA Ltd. A list of the titles can be seen in Appendix 4.

We frequently receive requests for technical information and advice from personnel in government and private entities, who recognise that the technical information and advisory component of SSA is the established authority on seafood matters and has access to the resources necessary to ensure prompt delivery.

Stephen Thrower and Alan Snow have presented technical papers on a variety of topics at various industry forums. Examples of topis include:

- Markets for Native Oysters
- Allergies in Seafood
- Quality Assurance systems in the Seafood Industry
- Seafood Hazards

We have both prepared and delivered a number of training courses, which have been specifically developed and delivered to meet the needs of the targeted audience. These have included:

- Curriculum development and course delivery for two enterprise based training courses for managers of seafood departments in two major supermarket chains;
- Curriculum development and course delivery on "Export Requirements for the Australian Seafood Industry", which was designed to upgrade the knowledge of AQIS personnel in the operational principles of HACCP;
- Lectures and practical sessions to Associate Diploma level students from the University of Queensland on seafood processing and technology.

Matching service delivery to clients needs

The needs of the client dictate the way in which an inquiry is handled. Whilst every client has individual needs, it is possible to make some generalisations.

Fishers, aquaculturalists and processors usually call when something has gone wrong. The first response is to listen carefully to their story, forming some idea of the cause of the problem. This is followed by a question and answer session to clarify the situation and assess the level at which the information can be provided. The response then varies; it might be some verbal advice, a short pamphlet sent by fax or Email, referral to a local expert or supplier of chemicals or equipment. If the client is exploring a new venture, a customised information pack may be appropriate. If possible we like to have the client visit us or we do a site visit if this is feasible.

Retailers usually call with inquiries about shelf life, food safety or packaging. We have a number of good texts covering shelf life and spoilage, and we either send a pamphlet, a letter containing advice, or a referral to a text such as the "Australian Seafood Users Manual". Questions on food safety and/or packaging need careful attention. We usually send qualified advice with a referral to a relevant authority.

Freight forwarders, agents, importers, exporters, and marketers present us with a variety of inquiries. Many of these are similar to those listed above. In addition, they are often interested in forming links with customers and suppliers. Part of the response to these is to

supply a current copy of the "Australian Seafood Industry Directory". It is also possible to provide them with contacts, prices etc. from our own databases.

Inquiries from scientists, engineers and technologists cover a very wide range of technical areas. Often they come to us because they value our knowledge of the industry, and also because they recognise that we have access to a much wider range of information and expertise than they do. The response to these inquiries is usually a technical paper, an information package, or a referral to an outside expert.

Lawyers and loss assessors usually call about insurance claims. They usually want a written opinion or an expert witness that they can present in court. After two court appearances we resolved not to do any further court appearances. Some consultancy work has also been done to support prosecutions and compensation cases.

Doctors' inquiries usually relate to dietary components, such as omega 3 fatty acids, wax esters etc. Since they have some scientific training, it is possible to discuss some of the caveats that surround these topics rather than simply sending bare scientific papers.

OUTCOME 4

Development of an extensive web site to provide much improved access to AUSEAS resources. *(Milestone 01 Jan 01 a)*

- The AUSEAS section of the DPI web site has been incorporated into the overall Seafood Services Australia Limited web page.
- The plan to allow access to the AUSEAS suite of DB text databases is under review within the context of the new web page design and copyright implications Given that SSA Ltd is now a private company;
- A database of seafood R&D funding sources has been replaced by referral to similar comprehensive services provided by both State and Commonwealth Departments (Primary Industries and State Development).

OUTCOME 5

Continued promotion and sales of post-harvest reports from FRDC and NSC.

- SSA will continue to sell copies of research reports of FRDC and the SSA Industry Development Fund.
- SSA has produced a range of its own publications, but its role in distribution will be that of a wholesaler rather than a retailer.

OUTCOME 6

Publication and release of 2001 edition of the Australian Seafood Industry Directory. *(Milestone 01 Jan 01 b)*

- This version of the Australian Seafood Industry Directory has been completed in both hard copy and electronic formats and is currently on sale.

OUTCOME 7

Further development of effective networks between researchers industry and government agencies involved in the development of the seafood industry.

- The SSA network has brought together some researchers, industry representatives and bureaucrats interested in food safety and quality, but a forum that focuses more on post-harvest production has not been convened since *Seafood Innovations '99.*

- As illustrated in Appendix 5. the very wide range of knowledge needed to satisfy the industry's needs could never be met by one organisation alone. In answering these inquiries, we have developed an extensive network of experts both nationally and internationally.
- We have established an informal seafood interest group in Brisbane, which brings together researchers, industry, and regulators. This group has met on a regular basis and has proved to be a very lively forum. The Queensland Seafood Marketers Association has agreed to assume the responsibility for the organisation of these events in the future. We note with interest that a similar group is meeting at the Sydney Fish Markets on a regular basis.

BENEFITS

As a result of the development and subsequent operations of Seafood Services Australia, the seafood industry is arguably the best placed of all commodity groups to cope with global demands for food quality and safety.

This stands in stark contrast to the situation twelve years ago.

In 1988, the Australian Science and Technology Council canvassed the possibility of developing a national Code of Practice for the on-board handling and preservation of catch and the on-shore transport, processing, and sale of product".

In addition, the FRDC publication, *National Seafood Consumption Study: Summary Report (1992),* identified that consumers had the following concerns regarding seafood:

- Distrust of suppliers and the risk of buying "sight unseen";
- Tendency of fish and seafood to "go off" quickly;
- Doubts about fish and seafood freshness;
- Poor product presentation and packaging;
- Confusion caused by different names for the same species;
- Marketing of fish and seafood under false names leading to a loss of consumer confidence in the product;
- Poor product quality due to a lack of knowledge of proper product storage and handling.

The situation today is that the industry has embraced concepts such as a national Australian Seafood Standard and Seafood Emergency Plan.

Tools available to facilitate the implementation of these initiatives include:

- SeaQual food safety guidelines for harvesting, aquaculture, retailing, and processing;
- The SeaQual guide to HACCP;
- Decision support systems to assist industry to select appropriate food safety and quality schemes (the Blue Chooser);
- A wide range of risk assessment tools;

Two years of intense negotiation between industry and relevant government sectors has resulted in the formation of the Australian Fish Names Committee and the development of an approved Australian Fish Names List, which will be incorporated into both the Food Standards Code and the Australian Seafood Standard. Alan Snow has played a pivotal role in the co-ordination of this committee.

All of these initiatives are underpinned by the resources of the Technical and Advisory services of SSA.

In the context of the Seafood Industry, the provision of information is only half the job. We provide knowledge. For example, recently a caller asked if there is a rapid test kit available for a particular test in seafood. There are, in fact, several kits available and by consulting the leader of a project evaluating these kits, we were able to direct him to the one that proved to be the most effective. Thus he received value added information.

The ultimate beneficiaries of this project have been the whole seafood chain. These have included clients such as:

- Fishers
- Processors
- Retailers
- Freight Forwarders and Agents
- Marketers
- Importers and Exporters
- Aquaculturalists
- Scientists
- Lawyers
- Loss Assessors
- The Medical Profession
- Government
- Community at Large

As discussed previously, the topics of their enquiries are many and varied.

Due to the integration of the three components of SSA, staff of AUSEAS have worked across all three projects, and it is impossible to quantify the benefits that will accrue from one specific project. Those areas where we have made a significant contribution will be discussed.

PROVISION OF TECHNICAL INFORMATION AND ADVICE

Throughout this project AUSEAS staff have continued to respond to inquiries from a wide range of subjects (see Appendix 5.

Appendix 6. provides an analysis of the source of enquiries. The disproportionate representation of Queensland can be partly attributed to the support for SSA provided by the QDPI Call Centre, which refers all seafood enquiries to us. It is also a reflection of the close working relationship that QDPI enjoys with FRDC.

As a result of the AUSEAS experience, SSA Ltd has an excellent set of resources and a well developed system for carrying out its functions in servicing industry's needs in this area.

SEAFOOD STANDARD

A standard for Australian seafood is currently being developed in consultation with the SSA Network bringing together a diverse range of government agencies and industry representatives. This will be of great value in developing consumer confidence and overcoming suspicion that has always plagued the seafood industry. When the standard is adopted, people will have confidence in the nature, safety, and quality of seafood.

FISH NAMES COMMITTEE

Central to the acceptance of a seafood standard, is agreement on a uniform set of fish marketing names. This goal has eluded us for many years, but great progress been made possible with the release of the CSIRO's Australian Seafood Handbook and the development of the Australian Fish Names List. Seafood Services Australia provides the secretariat for the Fish Names Committee.

FURTHER DEVELOPMENT

The Australian seafood industry will always operate in a high cost environment, and so must aim for the "top end" of the market. It must maximise returns by servicing its customers with high quality products and services and by extracting every possible dollar from the resource. Obviously its competitors will have the same objectives. It is vital that the industry adopts the very best technology and accesses the most lucrative markets. With the global spread of quality assurance and trade liberalisation, the playing field will become ever more level and the competition more fierce.

SSA Ltd has benefited from a formidable array of resources built up by the dedication of staff in its three components, and the generosity of funding that went into those projects. The effort to maintain those resources must not be allowed to slacken or be dissipated.

From the experiences of the AUSEAS exercise, the following recommendations can be made:

- It is important that the existing knowledge base be maintained and continually updated in response to the rapidly changing findings of global research and development.
- In order to maintain the currency of existing knowledge, linkages must be maintained and further developed to information sources such as:
    - Research Institutes;
    - Global databases;
    - International experts;
    - Global discussion groups;
    - Industry associations;
- It is important that the delivery systems that we use are the best available to meet the needs of our clients. This will require continuous monitoring and changing of delivery mechanisms. For example the Australian Seafood Industry Directory is currently available in CD and hard copy. Delivery of the directory in a web based format will facilitate more rapid updating and provide superior access to users.
- An exchange of ideas via an interactive on-line discussion group will promote free exchange of ideas and more rapid problem solving. This vehicle should be both established and supported by SSA Ltd.
- The international marketplace for seafood products is very dynamic and it is vital that SSA Ltd anticipates and fully meets the needs of its clients. To facilitate this, it needs to proactively develop the information and technological resources necessary. This could entail:
    - Proactively gathering knowledge;
    - Developing appropriate delivery mechanisms;
    - Commissioning further research.

A DPI project team investigated the issue of information service delivery in 2001. Alan Snow was a member of the project management team.

Through this process, a concept for the efficient delivery of information services was developed. A description of the four-tier model is outlined in the table below. It should be noted that this model was developed for a government department, but could form the basis for an SSA Ltd information service delivery vehicle in the future.

Level	Content	Access
1	Web page What a search centre can offer Access points for members and for non-members	Free access to everyone
2	Industry portal Includes databases, document delivery options (pay or direct) Contents pages Web links	Subscribing members only Do-it-yourself approach for clients
3	Customised service Professional does the searching for member and uses additional databases and resources	Value added approach Fee-based, cheaper for members but available for everyone
4	Analysis and reporting services Use of "brokers" top do analysis eg business intelligence, competitor profiles, etc List of contacts	Negotiated process per job

PLANNED OUTCOMES

Detailed discussions on the outcomes of this project can be found in Results/Discussions section. The project outcomes listed in the original application were:

1. An increased awareness of SSA and its services through promotion, cross selling, and an industry workshop. (Milestone 01 Jul 01 a)
2. Closer alignment of AUSEAS and the NSC in preparation for incorporation into the NSC.
3. The delivery of detailed information to clients more efficiently and effectively.
4. Development of an extensive web site to provide much improved access to AUSEAS resources. (Milestone 01 Jan 01 a)
5. Continued promotion and sales of post-harvest reports from FRDC and NSC.
6. Publication and release of 2001 edition of the Australian Seafood Industry Directory. (Milestone 01 Jan 01 b)

The activities of AUSEAS (later SSA -Technical Information and Advice component) have played a key role in the achievement of all of these key objectives listed in the National strategy for the Australian seafood industry (see BACKGROUND). In addition, as a result of the efforts of SSA, the Australian seafood industry has been a leader in implementing the reforms to food safety and quality demanded by food Standards Australia & New Zealand.

CONCLUSION

The concept of a technical information and advisory service has evolved from a limited low technology state, to a response system that uses the most affordable technology to the utmost.

When the service commenced, the height of technology for delivery of information was a fax machine sending information from printed sources. In today's operations, the most recent information from global sources can be retrieved electronically and despatched via e-mail instantaneously.

Despite this, however, it is vital to note that a large proportion of our knowledge has been gathered over past decades and this information is only available in printed form.

The challenges for the future are:

- To ensure that the knowledge gathered in the past is not lost or forgotten;
- To find answers to today's problems that integrate today's knowledge with the learnings of the past;
- To use the latest technology to present and deliver knowledge to our clients in a form most appropriate for their needs;

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3. Campbell C (2002) DPI e-Search Centre Project Management Plan, Department of Primary Industries, Brisbane
4. FRDC (1992) National Seafood Consumption Study: Summary Report, PA Consulting Group, Perth
5. Thrower S J (1993) A Business Plan for the Australian Seafood Extension and Advisory Service (AUSEAS) QDPI Brisbane

APPENDIX 1. INTELLECTUAL PROPERTY

The information disseminated in this project is, in general taken from the public domain, and the issue of intellectual property does not occur with such material

Copyright is vested in FRDC and the Queensland Government (see title page).

As noted in the text, draft copies of the advisory notes (*Seafood Bytes*) have been passed over to Seafood Services Australia Ltd which is responsible for submitting them for completion, peer review, and appropriate and formatting for posting on the SSA website.

The literature database and hard copy collection used in this project has been developed over some 15 years in both CSIRO and DPI Qld. For security reasons it is located adjacent to the library of the Centre for Food Technology, and access is available for staff of the Centre and SSA Ltd.

APPENDIX 2. STAFF

The following people have been engaged on this project.

STEPHEN THROWER - PRINCIPAL SCIENTIST

Stephen has now 31 years of experience in seafood technology, having worked for the CSIRO, Tasmanian Fisheries Development Authority, Qld Department of Primary Industries, several private consultancy companies, and UN agencies. He conceived the original AUSEAS project and has been project leader since its inception.

ALAN SNOW - SENIOR INFORMATION OFFICER

Alan has completed 30 years with the Department of Primary Industries, and has expertise in information systems development, information retrieval, and food safety and quality. He has been part of the AUSEAS and SSA projects since 1994. He also acts as co-ordinator of the Fish Names Committee.

BEVERLEY AUSTIN- ADMINISTRATIVE OFFICER

Beverley was employed with the project in both a casual and temporary capacity until 2000. Bev was responsible for many of the administrative functions within AUSEAS, and was an enthusiastic supporter of our involvement in Trade Shows.

JENNIFER LOOSE - ADMINISTRATIVE OFFICER

Jennifer was assigned to the project in July 2001. Jennifer was primarily responsible for many of the administrative functions of the newly formed Seafood Services Australia Limited, and played a major role in the transition from the DPI run project to the new SSA Limited.

RACHEL BRIGHOUSE – TRAINEE ADMINISTRATION OFFICER

Rachel was recruited as an Office Administration trainee to the Qld Department of Primary Industries and was assigned to the AUSEAS project. She completed her traineeship during 2000-2001.

MARIA MCGREEVY - TRAINEE ADMINISTRATIVE OFFICER

Maria was recruited as an Office Administration trainee to the Qld Department of Primary Industries and was assigned to the Seafood Services Australia project. She completed her traineeship during 2001-2002. Maria proved to be a highly valuable member of the team, taking responsibility for many administrative functions and important initiatives such as the organisation of the Seafood Interest Group meetings. Maria has been subsequently employed by the QDPI.

SUE POOLE - SENIOR SCIENTIST

Sue was employed on a part time support capacity for three months while Stephen Thrower was assigned to complete the SSA – Product and Process Development on the departure of Mr Ian Wells.

APPENDIX 3. SEAFOOD EXTENSION AND ADVISORY SERVICES – A REVIEW

INTRODUCTION

Everyone trading in seafood today is competing on a world market. Those producing seafood for the domestic market are in competition, not only with local producers, but also with imports from overseas. Exporters are in fierce competition with companies worldwide for a "piece of the action" in lucrative markets overseas.

For many years, the seafood industry in Australia has considered itself to be at a disadvantage due to its low volume, high cost production. To counter this, operators have sought out and concentrated on high priced products and moved from being a supplier of bulk commodities to focus more on niche markets that trade in smaller quantities. Naturally, other countries are also targeting these markets, and so competition is fierce.

Success in niche markets depends, to some extent, on favourably distinguishing your product from your competitors'. There are numerous points of difference you can highlight, including eating quality, grading, packaging, presentation, reliability, after-sales service, and convenience. Building these attributes into the product is fundamental to value adding.

Of course, our competitors are also aware of these needs, and so they are similarly improving their products, often with the advantage of much lower labour costs. To counter this, Australian producers need to access and apply the knowledge generated by relevant research and development.

HISTORICAL BACKGROUND

A State funded technical information service for seafood processors was set up within the Tasmanian Fisheries Development Authority in 1982 by Stephen Thrower, and operated until 1986. In 1987, the Fishing Industry Research and Development Council (FIRDC - the forerunner of FRDC) approved project no. 1987/121 "Establishment of a Technical Consultancy Service for the Australian Seafood Industry", a three year project set up within the Tasmanian Food Research Unit of the CSIRO. The Unit subsequently became the Seafood Technology Section of CSIRO Division of Fisheries in Hobart.

The Australian Science and Technology Council conducted a review of the state of post-harvest technology in the Australian fishing industry in 1989 and published a report entitled *Casting the Net*, which listed a number of recommendations to facilitate development of the seafood industry. The following recommendation was made (recommendation 2):

That CSIRO establish the Seafood Technology Section of the CSIRO Division of Fisheries as a Seafood Technology Centre with national responsibilities for post-harvest research and development. Amongst its functions the centre would:

- *Undertake short and longer term research;*
- *Provide liaison, information and advisory services to government and industry;*
- *Establish and maintain a network of Australian researchers in fisheries post-harvest; and*
- *Provide placements for graduate students and industry nominees.*

To give effect to these recommendations, the then FIRDC provided funding for a workshop convened under the chairmanship of Mr Bernard Bowen, then Director of WA Fisheries and Chairman of FIRDC, at the University of Western Sydney. This meeting brought together representatives of all the stakeholders in post-harvest R&D in Australia. Participants were drawn from:

- CSIRO

- Universities of NSW, Western Sydney, and RMIT
- Processors from WA, Qld and Vic.
- DPIE
- QDPI
- FIRDC

As a result of this workshop, plans were made to establish a National Seafood Centre in the grounds of the University of Tasmania. Land would be provided by the University, funding support from DPIE, and technical and administrative support from CSIRO Division of Fisheries.

The Centre would have a permanent staff of 10, with a further 10 post-graduate and post-doctoral researchers. Operational funding would come from several sources including FIRDC, CSIRO, ACIAR, FAO, and agencies such as DANIDA (Danish Aid Agency) as well as tertiary institute sources and industry consultancies. A site was selected and preliminary plans for the building were drawn up.

Unfortunately the plan lapsed when CSIRO Fisheries Division encountered funding difficulties. It decided that post-harvest research was not in its area of core research, and retrenched the six staff of its Seafood Technology Section. QDPI decided to progress the concept, and recruited two key staff from CSIRO to join its Seafood R&D team in Hamilton, Queensland in 1990.

The formation of the Fisheries Research and Development Corporation (FRDC) provided a new stimulus in the area of post-harvest activities. Several large post-harvest research projects were approved and funding was provided in 1991 for a National Seafood Information Service (NSIS) to be run by the QDPI in Queensland. The FRDC commitment to this service has continued over the eleven succeeding years.

The activities of the service have expanded from answering enquiries from the processing sector either orally or by the provision of written material, to encompass the sale and sometimes the preparation of publications, as well as participating in a wide range of activities that are discussed in this final report.

APPENDIX 4. SEAFOOD BYTES – LIST OF TITLES

A set of 52 Seafood Bytes has been prepared in draft form. They need editing and review. Examples of two of these are attached

1 Handling oysters
2 Handling redclaw and yabbies
3 A quality system for fresh fish
4 Beche de mer
5 Biofilters for live seafood
6 Black spot in prawns
7 Blue spot in abalone
8 Chlorine based sanitizers
9 Cholesterol in seafood
10 Ciguatera poisoning Version 1
11 Food safety facts on ciguatera Version 2
12 Cooking mud crabs
13 Cooking prawns
14 Displaying seafood
15 Exporting seafood
16 Liquid fertilizers from seafood
17 Operating a fish filleting line
18 Fish oils
19 Fish Silage
20 Food safety facts on *Listeria* Version 2
21 Freezing seafood
22 Procedures for handling sand crabs
23 Histamine in fish
24 Ice and seafood
25 Listeria in seafood Version 1
26 Modified atmosphere packaging of seafood
27 Measuring the temperature of fish
28 Neurotoxic shellfish poisoning
29 Flexible films for packaging seafood
30 Paralytic shellfish poisoning
31 Why is seafood so perishable?
32 Phosphorus in seafood
33 Polyphosphates and seafood
34 Puffer fish poisoning

35 Rapid tests for histamine in seafood
36 Stowage of fish in refrigerated sea water
37 Retort pouches and seafood
38 Rigor mortis in fish
39 *Salmonella* in seafood
40 Scombroid poisoning
41 Sharks – processing and utilisation
42 Shelf life – How long will seafood keep?
43 Smoking fish
44 The future for smoked seafood
45 ICETIME – time temperature relationships in spoilage of seafood
46 Is this fish fresh?
47 Seafood marinades
48 Fish leathers
49 Katsuobushi
50 Customised information packages
51 Edible and biodegradable packaging materials
52 Drying Abalone

APPENDIX 5. REQUESTS FOR INFORMATION – TITLES

Abalone

- Canning
- Canning - quality factors
- Export Information
- Processing and Drying
- Processing Plant
- Retort Pouch processing
- Species Information
- Thermal Processing
- Tropical - general

Aquaculture

- Aquatic Plants as Feed
- Barramundi
- Cephalopods
- Contamination in Barramundi Ponds
- Eel
- Equipment suppliers
- Factors affecting mouldy taste in pond fish
- Feeds Development
- Frogs
- Harvesting Information
- Importance of Dissolved Oxygen
- Industry Information
- Market information
- Mud crabs
- Mussels
- Oysters
- Prawns
- Prawns - HACCP plan
- Purging and salinity
- Quality Systems
- Redclaw
- Silver Perch
- Technology
- Tropical Tuna
- Water Quality for Ponds
- Yabbies
- Yabby Production and Marketing
- Aquaculture Feed - Manufacture

Bait Preservation

Barramundi

- Aquaculture
- Aquaculture Code of Practice
- Enquiry about Marketing Name for Imported
- Generic HACCP plan for farm
- Marketing
- Smoking

Beche de Mer

- Aquaculture
- General Information
- Identification
- Processing

Blue Swimmer crabs - Packaging and Processing

Carp

- Overview and general information
- Processing
- Utilisation for Human Consumption
- Waste Utilisation

Cephalopod - Marinading Methods

Composition and Nutrition

- Abalone
- Certain species
- Devilfish
- Nile Perch
- Oysters - Dry weight v Wet Weight
- Prawns
- Seafood
- Shark species
- Silver Perch
- Squid
- Composition and Nutrition – Swordfish

Coral Trout - Spiking or Brain Killing

Crabs

- Pasteurisation of meat
- Processing and Handling

Crustacea

- Black Spot
- Chitin from Crabs
- Cooking mud crabs by microwave
- General
- Live Transport
- Tagging
- Uses of the shell from Soft Shell Crab

Eel

- Construction of processing plant
- Domestic markets
- Export assistance

Export Assistance

- AUSTRADE in Taiwan
- Burma trade requirements
- Contacts in Malaysia
- Export Terms (incoterms)
- Fresh fish to Asia
- Freshwater crayfish
- Frozen Lobster, crabs and abalone
- General
- General Trade
- Glass Eels to China
- Indonesia
- IQF squid, markets and procedures
- Live Coral Trout
- Live Fish
- Live Lobster, crabs and abalone
- Live Mud Crabs
- Live Prawns
- Lobsters
- Moreton Bay Bugs
- Oysters
- Packaging Prawns
- Potential Markets
- Sand Crabs
- Seafood
- Spanner Crabs

Fish

- Ciguatera
- Line fishing and Asian Markets
- Live Transport
- Live Transport of Fingerlings
- Long Lining
- Retail Information
- Smoking
- Species identification

Fish fillets

- Determination of Age
- Standards for Frozen Blocks

Fish Processing and Handling

- Shelf Life Extension On The Vessel
- Water Quality during Capture
- Code of Practice
- Curling of golden snapper fillets when grilling
- Drying techniques
- Ike Jime
- Injection systems for smoking
- Lacing in Fish Fillets
- Live Transport
- Marinating seafood
- Ornamental - Live Transport

- Purging and salinity
- Quality Index
- Rapid fat Test Procedure
- Retail packaging
- Salt

Fish Products

- Fish Powder
- Fish Sausage
- Formulation of Crab Sticks, seafood extender, etc
- Katsuobushi
- Leather
- Minced Fish
- Modified Atmosphere Packaging
- Roe
- Shark Fin
- Tuna Jerky

Fish Quality

- Age of Fish Portions
- Effect of storing Hogg salmon in ice water
- Effects of Autolysis on the quality of flesh
- Freezing rates

Fish Smoking - Salt Water Phase Content

Fishery Statistics

- Australia
- Export of Mud Crabs
- Export of Oysters
- Export of Shark Fin
- Exports of Lobsters
- Prawn Aquaculture Production
- Sales to Retail Sector
- Trade Statistics
- Various Pacific Countries

Freshwater Crayfish

- Cooking
- Freezing
- Processing

HACCP - General Information and Assistance

Health

- Allergens - Patagonian Toothfish
- Allergy to Prawns
- Iodine toxicity levels in Fish
- Transfer of Allergens from Prawns

Industry Information

- Australian Seafood Industry
- Australian Seafood suppliers
- Contract Fish processors
- Contract Smokers
- Eel processors
- Fish names
- Marketing and sale of Tasmanian seafood, primarily oysters and mussels
- Marketing Names and Aquaculture
- Price of Australian Prawns
- Price of Jellyfish
- Price of Yabbies
- Production statistics
- Qld Pearling Industry
- Queensland Quotas
- Quotas
- Seafood Consumption
- Seafood Consumption in NSW
- Seafood processing Courses
- Seafood Training

- Setting up an Aquaculture facility
- Size of Spanner Crab Industry
- Suppliers
- Trade Statistics for Lobsters

Jellyfish - Market Prices

Live Fish

- Conditions of Fish Tanks
- Grow out
- Shrinkage during holding
- Tanks - stocking densities

Lobsters

- General Information
- Imports from Solomon Islands
- Live Holding Tanks
- Live Holding tanks
- Live packaging
- Live Transport
- Phosphate levels
- Processing, Fresh Cooked, and Frozen Cooked
- Southern Rock - Handling and Transport
- Storage Life
- Trade Statistics
- Tropical, Mortality

Mackerel - Smoking - HACCP material

Marron - Post Harvest Handling

Mud Crabs

- Cooking by microwave
- Catching seasons
- Handling and Holding
- Handling and Processing
- Live Transport Methods
- Live Transport Packing
- Market Information
- Processing and Packaging
- Stocking Densities

Mullet - Handling and Processing

Mussels

- Marinades
- Production Weight
- Value adding options

Octopus

- Blue Ringed - Toxicity
- Food products
- Freezing and Handling

Oysters

- Aquaculture and processing
- Freezing
- General Industry Information
- HACCP Risk Identification Material
- Handling and Transport
- Pacific - Markets
- Production Statistics
- Shelf Life of Freshly Opened
- Shucking and Processing Options
- Smoking
- Sydney Rock - General Information

Pilchards

- Value Adding Options
- Processing Methods
- Production of Marinades

Prawns

- Black Spot
- Black spot and Drop Tail
- Brine Chilling
- Cooking
- Detecting undercooked prawns
- Domestic Market Prices
- Domestic markets
- Electronic grading
- Freezing
- Grow out and sales
- IQF - Thawing Process
- Kuruma
- Methods of Thawing
- Nutritional labelling and Panel

- Storage and Handling
- Storage life of frozen
- Temperature and Storage Times
- Thawing procedures
- Transport and Handling
- Trawling
- Wild Caught - General Information

Redclaw Crayfish

- General
- Grow out and sales

Reef Fish - Live Transport

Salmon Processing - Generic HACCP Plan

Sand Crab - Exports

Sashimi - Grading

Scallops

- Processing
- Mercury Levels
- Methods of Thawing
- Potential Export Markets

Sea Urchin

- Fishing
- General
- Processing and Handling

Seafood

- Determination of shelf life
- Live Transport
- Nutritional Labelling

Seafood Industry

- Abalone Suppliers
- Exporters
- Fisheries Resources
- Sources of Fish Stock
- Statistics
- Suppliers
- Suppliers of Liquefied Fish Waste
- Suppliers of Live Eel
- Suppliers of seaweed
- Suppliers of Spirolina
- Suppliers of sushi
- Suppliers of Trochus Shell
- Suppliers of Tuna
- Trade Statistics
- Seafood Consumption

Seafood Industry Development - PNG

Seafood Premises

- Processing Room
- Building permits
- Cleaners and Sanitisers - plant based cleaning products
- Export Certification
- Standards required for company layout for Fish Filleting
- Standards required for company layout for Oyster Shucking

Seafood Processing and Handling

- Cleaners and sanitisers
- Factory Design
- Handling, storage and display
- Smoking
- Film for Packaging
- Freezing
- Live HACCP material for retail outlet
- Live Handling
- Modified Atmosphere Packaging
- Ozone packaging
- Ozone Treatment of water
- Smoking and Drying
- Standards for temperatures
- Storage Conditions
- Storage Temperatures
- Storage Times
- Temperature Test Strips
- Use of polyphosphates
- Vacuum Packaging
- Yields

Seafood products
- Freezing
- Labelling
- Microbiological Test Information

Seafood Safety
- Codex Materials
- Seafood
- Shelf life of Oysters
- Training Materials

Seafood Technology
- Canning
- Posters
- Seafood Industry Training Materials

Seafood Transport
- Temperatures
- Time / Temperature

Shark
- Australian Market Species
- Handling Practices
- Processing and Handling
- Processing and Products
- Shark Fin
- Shark Meat
- Uses for Under-utilised shark flesh

Silver perch - Packaging and Handling

Silver Warehou - General

Smoking of crustaceans especially crabs and freshwater crayfish

Spanner Crabs
- General
- Industry Information
- Live holding

Squid
- Imports, trade legislation and labelling
- Processing Aids
- Processing Methods
- Protein Content

Swordfish
- Information - Energy levels
- Minced meat products

Threadfin bream
- General Information

Tilapia - General Information

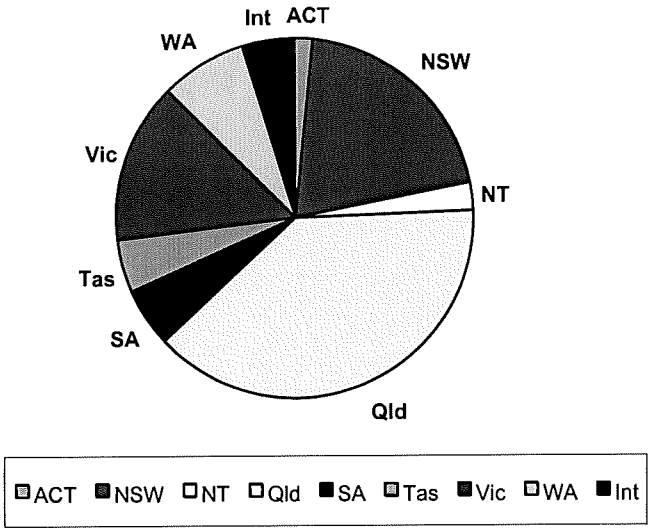
Trochus
- Canning
- Names of Shell Divers

Tuna
- Aquaculture
- Broadbill - Value Adding Options
- Canning
- Chilling
- Freezing times
- Handling and Processing
- Long Lining
- Minced flesh products
- Processing and Handling
- Processing and Handling
- Production Statistics
- Yellowfin, Handling

USDA Standards - Bone Size

Waste Utilisation
- Caviar from Fish Roe
- Caviar from Salmon and Trout
- Caviar from Atlantic Salmon
- Extraction of Chitin from residues
- Fish Hydrolysis
- Fish Leather
- Fish Meal and its alternatives - process conditions, transport & storage
- Fish Silage
- Fish waste
- General
- Manufacture of Fish Fertiliser

APPENDIX 6. SOURCES OF REQUESTS FOR TECHNICAL INFORMATION



Source of requests for technical information from the SSA - TIA staff from a total of 402 substantive inquiries over the 2 year project. There were about 1,600 inquiries overall.

Source	% Calls	Source	% Calls
Qld	39%	Tas.	5%
NSW	20%	ACT	2%
Vic.	15%	NT	2%
WA	8%	International	5%
SA	5%		

The Source of International requests was:

Country	Calls	Country	Calls
China	1	New Zealand	3
Fiji	1	PNG	2
Hong Kong	2	Singapore	2
India	1	United Kingdom	1
Israel	1	USA	5
Japan	1		