

付 属 資 料 2

合 同 評 価 書

(ミ ニ ッ ツ)

**THE MINUTES OF MEETING
BETWEEN
THE JAPANESE EVALUATION TEAM
AND
THE AUTHORITIES CONCERNED
OF THE GOVERNMENT OF THE KINGDOM OF THAILAND
ON
JAPANESE TECHNICAL COOPERATION
FOR
THE RESEARCH PROJECT
ON THE QUALITY DEVELOPMENT OF FISHERY PRODUCTS**

The Japanese Evaluation Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Akira Niwa visited the Kingdom of Thailand from October 4th to October 17th, 1998.

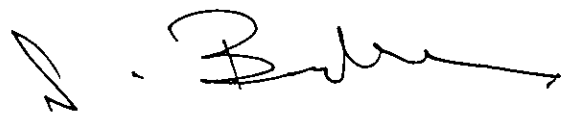
During the Team's stay in the Kingdom of Thailand, the Team had a series of discussions with the Thai authorities concerned, and jointly evaluated the present achievement of the Research Project on the Quality Development of Fishery Products (hereinafter referred to as "the Project").

As a result of the discussions, both sides agreed to report to their respective Governments the matters referred to in the documents attached hereto.

Bangkok, October 14th, 1998

丹羽 行

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LIST OF ABBREVIATIONS

DOF	: Department of Fisheries
FIQD	: Fish Inspection and Quality Control Division
FTDI	: Fishery Technological Development Institution
GLP	: Good Laboratory Practice
GMP	: Good Manufacturing Practice
HACCP	: Hazard Analysis Critical Control Point
PDM	: Project Design Matrix
R/D	: Record of Discussion
SEAFDEC	: Southeast Asian Fisheries Development Center
SOP	: Standard Operating Procedure
TSI	: Tentative Schedule of Implementation

THE ATTACHED DOCUMENT

I. INTRODUCTION

1. Background of the Project

Fisheries in Thailand have been playing an important role not only as a source of animal proteins for Thai people but also as a source of foreign currency earning. In the early 1990s, however, it was found that food preservatives were added more than the acceptable level in processed fishery products and antibiotics were extensively used in shrimp culture. The residue of these chemicals became a serious problem pertaining to food safety. The exported fishery products were often rejected due to the safety standards of importing countries.

Under these circumstances the Project on the Quality Development of Fishery Products started in April, 1994 with the project period of 5 years. With the remaining project period of approximately 6 months, the Team visited Thailand from October 4th, 1998 to evaluate the achievement of the Project together with Thai side.

2. Objectives of Evaluation

Objectives of the evaluation are as follows:

- (1) To execute a comprehensive evaluation of the present achievement in accordance with the original plan documented in R/D, TSI, Annual Work Plan and PDM.
- (2) To make recommendations and suggestions to the authorities of the respective Governments concerning with the measures to be taken for the rest of the project period and after the termination of the project.

3. Methodology of Evaluation

3-1 Survey

The Project was evaluated jointly by Japanese and Thai sides. The Team visited two project sites (FIQD and FTDI) and some fish processing companies, and carried out a series of hearings from Thai counterpart personnel and Japanese long-term experts.

3-2 Items of the Evaluation

3-2-1 Achievement of the Project

Achievement of the Project was evaluated in terms of inputs, activities, outputs and project purpose, all of which are in accordance with R/D, TSI and PDM.

3-2-2 Analysis on Evaluation Issues

(1) Effectiveness



(1) Effectiveness

Effectiveness was assessed by evaluating the extent to which the Project has achieved outputs and project purpose.

(2) Impact

Impact of the Project activities was identified as positive and negative changes produced by the Project directly and indirectly (including unexpected changes).

(3) Efficiency

Efficiency of the Project implementation was analyzed focusing on the relationship between inputs and outputs in terms of timing, quantity, and on linkage with other cooperation scheme of JICA and other organizations.

(4) Rationale

Rationale of the Project was reviewed as the validity of project purpose and overall goal in connection with the development policy of the Government of Thailand and needs of the beneficiaries.

(5) Sustainability

Sustainability of the Project was forecasted in organizational, financial and technical aspects by examining the extent to which the achievement of the Project is sustained or expanded after the assistance is completed.

4. PDM for Evaluation

PDM was not prepared at the start of the Project. Therefore, through review of past documents and discussions with the parties concerned, the Team and Thai side agreed to use PDM summarized in Annex 1.

Narrative summary of the PDM is as follows:

The Overall Goal of the Project:

-to assure consumers including importers that fishery products of Thailand have been processed in an appropriate and wholesome manner.

The Purpose of the Project:

-to improve the technique concerned with the quality control of fishery products, before, during, and after processing.

Outputs:

1. Some techniques of FIQD in analyzing contaminants/additives in fishery products are strengthened.
2. The research activities of FTDI in analyzing contaminants/additive in fishery products are strengthened.

3. The factory inspection system for quality control of fishery products is improved.

Activities:

- (1-1) Introduce some analysis technologies, assure of accuracy, and conduct research on quality evaluation and quality control at FIQD.
- (1-2) Carry out research on quality improvement of fish processing factories based on the technology developed at FIQD.
- (2-1) Introduce some analysis technologies, assure of accuracy, and conduct research on quality evaluation and quality control at FTDI.
- (2-2) Carry out research on safety of fishery products based on the technology developed at FTDI.
- (3-1) Prepare plans of HACCP and GMP.
- (3-2) Carry out extension activities based on the above results.

II. RESULTS OF EVALUATION

1. Achievement of the Plan

1-1 Achievement of Input

Refer to Annex 2 in details.

(1) Japanese side

1) Dispatch of Experts

In accordance with the R/D, the Japanese side dispatched six (6) long-term experts and fifteen (15) short-term experts to the Project.

2) Training of Thai Counterpart Personnel

Fifteen (15) Thai counterpart personnel were trained in Japan.

3) Provision of Machinery and Equipment

The machinery and equipment of approximately 174 million yen were provided for the Project.

4) Local expenditure

Approximately 28 million yen was spent for the project activities, including the expenditure for extension, technical exchange, and emergency assistance for the Asian countries.

(2) Thai side

1) Provision of Land, Building and Facilities

The necessary spaces for laboratories and office of the Project have also been provided in line with the R/D.

2) Allocation of Local Cost

A budget of approximately 355 million Bahts was allocated for on going work from

1993/94 to 1998/99.

3) Allocation of Counterpart personnel

Twelve (12) counterparts from FIQD and thirteen (13) counterparts from FTDI were allocated.

1-2 Achievement of Activities

Refer to Annex 3 in details.

1-2-1 FIQD

(1-1) Introduce some analysis technologies, assure of accuracy, and conduct research on quality evaluation and quality control at FIQD.

Acquisition of a microbiological examination on related 9 harmful microorganisms, such as *Escherichia coli*, *Salmonella* group, *Vibrio cholerae*, *Clostridium botulinum* was successfully done and some of their SOPs have been established.

Acquisition of 20 chemical analysis methods on 2 food additives, 2 pesticide residues, 8 heavy metals, 7 antibiotics and 1 chemical contaminant has been conducted.

Acquisition of 9 biological examinations, such as 4 natural toxins, 4 bioassay of antibiotics, and 1 parasite has also been conducted.

Validation for inspection and analytical methods has been conducted to some extent by cross check and will be confirmed.

(1-2) Carry out research on quality improvement of fish processing factories based on the technology developed at FIQD

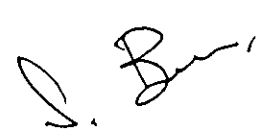
Four studies on quality preservation and technologies for utilization of fish resources were carried out as individual research project at FIQD and two of them were reported in the research bulletin.

1-2-2 FTDI

(2-1) Introduce some analysis technologies, assure of accuracy, and conduct research on quality evaluation and quality control at FTDI

Acquisition of a microbiological examination on related 10 harmful microorganisms, such as *Escherichia coli*, *Salmonella* group, *Vibrio cholerae*, *Clostridium botulinum* was successfully done and some of their SOPs has been established.

Acquisition of 48 chemical analysis methods on 14 food additives, 5 pesticide residues, 7 heavy metals, 3 antibiotics, and 1 chemical contaminant, 18 nutritional



components, has already been carried out.

Acquisition of 10 biological examinations, such as 4 natural toxins, 4 bioassay of antibiotics, 1 bioassay of vitamin and 1 parasite has also been conducted.

In addition, 3 quality evaluation chemical factors, 3 physical tests, and 2 chemicals has already been aquired.

Validation for inspection and analytical methods has been conducted to some extent by cross check and will be confirmed.

In order to establish inspection and laboratory assurance system by implementing comprehensive GLP, SOPs on analytical methods, maintenance of equipment, laboratory waste management were introduced.

Quality evaluation and quality control for fishery products, quality indices, and shelf-life of fishery products have been mainly studied at FTDI.

(2-2) Carry out research on safety of fishery products based on the technology developed at FTDI

Monitoring food additives, heavy metals, pesticide residues in fishery products and biotoxin in freshwater puffer fish, horseshoe crab and their living environment together with the study of nutritional component table of fish and shellfish at FTDI and will be continued by the end of this year.

FIQD
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1-2-3 FTQI and FTDI


(3-1) Prepare plans of HACCP and GMP

Preparation of GMP manuals and guideline of HACCP system for some fishery industries, such as frozen surimi, retort pouched packaging, dried shrimp and fish sauce processors, were established at FIQD and FTDI. These results have been reported in the research bulletin as outputs of the Project.

(3-2) Carry out extension activities based on the above results

Seminars and workshops in relation to the quality control were held 3 times for the manufacturers of fishery products and DOF staff by FIQD. Workshop on microbiological examination will be held this year.

Seminars and workshops on information of food hazard and hygienic control were also held 3 times for researchers and manufacturers by FTDI. Workshops on biotoxin were held twice at FTDI. The seminar on marine puffer fish identification was also held in September, 1998.



Posters on horseshoe crab, freshwater puffer fish, and personal hygiene were prepared and circulated by FTDI and FIQD, respectively.

FTDI and FIQD are providing information on the internet home pages in addition to the above mentioned activities.

1-3 Achievement of Outputs

1-3-1 Some techniques of FIQD in analyzing contaminants/additives in fishery products are strengthened.

The total number of analytical items at FIQD which were strengthened by the collaborative work with Japanese experts and counterpart training in Japan increased to 38. The analytical items applied for the routine inspection work at FIQD increased from 30 in 1994 to 51 in 1998, which include 24 chemical analyses, 21 microbiological analyses and 6 physical analyses. Total number of annual inspection samples at FIQD were about 300,000 in recent years.

In order to verify the accuracy of analytical techniques introduced by the Project, the cross check procedure has been carried out. Verification results were satisfactory except for some analytical items, on which further improvement of analyses is necessary during the remaining project period. Pertaining to GLP, the organizational set-up including quality assurance unit has already been implemented and SOP has been introduced for some specific analytical methods and equipment. However, the total system of GLP has not yet been accomplished.

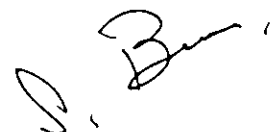
Quality and quantity of the analytical equipment have been obviously improved through the procurement by the project budget of Japanese...

1-3-2 The research activities of FTDI in fishery products are strengthened.

FTDI

The total number of analytical items at FIQD which were strengthened by the collaborative work with Japanese experts and counterpart training in Japan increased to 76.

A series of research on quality control and quality development has been carried out at FTDI in terms of individual research projects. Their summary is shown in Annex 6. The accomplishments of those research have been published not only in technical papers of DOF but also in scientific journals. Some papers prepared by counterparts together with JICA experts were also published in international journals. Moreover, the highlight of the research activities during the Project was compiled in two volumes of journals, namely Fish Technology Research and Inspection Volume 1 (November, 1996) and Volume II



(March, 1998). The Volume III will be available by the end of the Project period. Overall, about 30 research papers have been published by the counterparts of FTDI.

As the results of FTDI activities, standardized techniques for the establishment of SOP system have been developed and introduced.

Accuracy of analysis has been improved remarkably at FTDI. Based on the result of cross check, bacterial strains were appropriately identified and more than 90% of recovery was assured for food additives. SOPs for major equipment have been successfully established although the achievement of GLP is behind of FIQD to some extent.

Before the start of the Project, FTDI did not have enough analytical equipment to conduct researches efficiently. The Project provided a series of research equipment in order to upgrade analytical techniques of FTDI, which stimulated their activities.

1-3-3 The factory inspection system for quality control of fishery products is improved

FIQD and FTDI have been carrying out the development of factory inspection system for exporting fishery products. Initially, FIQD was responsible for frozen and canned products and FTDI for traditional products. The responsibility of factory inspection on traditional products was transferred from FTDI to FIQD from July, 1997. Therefore, FIQD is now a single public organization in DOF concerning factory inspection for exporting fishery products from Thailand.

During the Project period, both Japanese and Thai experts made significant effort to introduce GMP system in the factories to acquire HACCP qualification, which is indispensable for exporting products to USA and EU, through the preparation of guideline and extension activities. Guidelines or instruction manuals formulated by the Project include HACCP generic models for fish sauce and dried shrimp (FTDI) together with quality assurance program for frozen surimi (FIQD) which were published in Fish Technology Research and Inspection, Volume II. In addition, seminars for private sector were held constantly. Those include "Hygienic practice in fish processing plants (1996)" and "Critical control point for retort pouch processing (1997)".

1-4 Achievement of Project Purpose

It is concluded that the Project purpose has been successfully accomplished by increasing the numbers of trained staff, equipment and manuals with accumulated techniques introduced through the Project as well as the achievement of outputs described in the above sections.

2. Analysis on the Five Evaluation Criteria

2-1 Effectiveness

The effectiveness of the Project seems to be high because all three outputs have contributed to achievement of the project purpose. Recent analytical techniques and quality control system of Japan were introduced to FTDI and FIQD, then these techniques were applied for research activities mainly in FTDI and improvements of factory inspection system mainly in FIQD. The implementation of cross check can be recognized as useful procedure in order to examine the accuracy. Since the results of cross check were not satisfactory at the moment, further improvement of specimen preparation and analytical methods is necessary. The results of research were compiled in research bulletins and improved factory inspection system was extended to private factories through the guidelines prepared and seminars.

2-2 Impact

Number of fish processing factories which promote GMP and acquire HACCP certification increased through dissemination of technical information as well as improvement of factory inspection practice conducted by FTDI and FIQD. It is obvious that the Project contributed significantly to strengthen those activities. Number of approved GMP establishments including freezing plants, canneries and traditional product processors increased from 143 in 1996 to 179 in 1997 and to 190 in October 1998. Percentages of those establishments which have fully implemented HACCP were 50%, 65% and 76% in 1996, 1997 and 1998, respectively.

FIQD is now recognized as one of the most reliable institute for fish quality inspection by many countries and regions which import the fishery products from Thailand. Those include EU, Canada, USA, Australia, New Zealand, Brazil, Argentina, the Republic of Korea, Russia, Rumania, the Republic of Czech and Japan. Most of exporters in Thailand highly evaluate the inspection ability of FIQD at present.

Although statistical data on claim cases from importing countries are not available, rejection percentage of fishery products by FIQD's sample inspection has been decreasing, particularly for that caused by *Salmonella*.

Food poisonings caused by aquatic animals like horseshoe crab and puffer fish seem to be minimized recently partly due to the campaign activities of the Project, i.e. preparation and distribution of posters. Basic research at FTDI on toxic analysis under the Project played an important role on these activities.

As for other positive impact of the project, following things can be pointed out:

- 1) planning of technology dissemination of surimi processing using an experimental

- surimi plant which was introduced by the Project
- 2) planning of collaborative study on the formulation of snack products with fish powder (Royal Family Project)
 - 3) training of university students about analytical equipment

There are no negative impacts caused by the Project.

2-3 Efficiency

(Japanese side)

In spite of the large number of counterpart and the wide variety of the activities, the Project has implemented successfully owing to the effort of Japanese experts. There was a difficulty, however, in recruiting process of specific fields from some experts because the human resources of these fields are also limited in Japan.

Counterpart training was conducted as planned except for one specific field (identification of fish species using polymerization chain reaction), because of the difficulty to find the adequate organization in Japan. The training on this subject was substituted with more common one which seemed to be applicable in Thailand. Upon acquiring Japanese progressive technology and knowledge, many of the trainees became more confident on analysis.

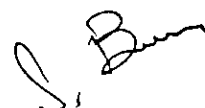
The machinery and equipment provided by the Project were sufficient both in quality and quantity, and were fully utilized during the Project. As a result, FIQD and FTDI have been acknowledged as one of the best facilities in a field of fish quality research and inspection in the Southeast Asian countries.

Local expenditure provided by Japanese side was fully utilized especially under severe economic conditions of Thailand. Using this expenditure, the Project could purchase reagents and small-scale equipment, publish the research bulletins and conduct some seminars and workshops as shown in Annex 4. In addition to the general local expenditure scheme, the technical exchange expense was used for the observation trip to SEAFDEC in Singapore.

(Thai side)

The space and facilities which were prepared by Thai side for the Project were sufficient. At the beginning, FTDI was located in Yannawa, while FIQD in Kaset Klang. The separation of the project sites made project activity inconvenient, however, it was solved by the moving of FTDI from Yannawa to Kaset Klang in March, 1997.

Since 1997, the budget allocation became tight due to the decline of Thai economy. In particular the budget for research activities has been limited.



The counterparts assigned to the Project were fully educated having sufficient capability for receiving technologies introduced by Japan side. They have been carrying out collaborative work with high motivation.

2-4 Relevance

The project purpose corresponds to the present development policy of the Thai government. Research and technical development of quality control is one of top priorities for the Ministry of Agriculture and Cooperatives as shown in the on-going Eighth National Economic and Social Development Plan (1997-2001). Following the National Plan, DOF stresses the Fishery Industry Policy aiming to improve standard and quality of the fishery products to meet the international requirement.

This Project has introduced various modern technologies and equipment in order to fulfill the project purpose. It is highly expected that the result of the Project contributes to the overall goal namely the assurance of consumers including importers about appropriateness of fishery product of Thailand. Considering the sufficient results of the Project through the policy of Thai Government, it is concluded that the Project was adequately designed and is highly relevant.

2-5 Sustainability

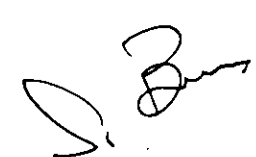
(1) Organizational Aspect

More than one agencies are involved in the food quality control system in Thailand as in many other countries. DOF has a responsibility for inspection and quality control of seafood for exports to ensure that the fishery products from Thailand and the processor's performance are in compliance with the requirements and regulations of importing countries. Department of Medical Science, Ministry of Public Health generally deals with food quality control mainly from hygiene aspect. As far as fishery products for export are concerned, most of importing countries only recognize and accept the certificate and assurance of DOF. DOF is the competent authority for EU and Canada and recognized by Ministry of Health, Japan as well.

In DOF, the role of two organizations regarding quality control namely FTDI and FIQD has been demarcated well. FTDI is mainly responsible for research and development of fishery products and transfers technology to processors, while FIQD's roles are mainly technical service and assistance on inspection and quality control to support the industry.

Since the Ministry of Agriculture and Cooperatives of Thailand recently declared a statement to integrate organizations concerning food inspection for export, there will be some discussions about future re-organization of FTDI and FIQD. However, there is no

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doubt that improved function of those organizations will be sustained, considering the importance of exporting fishery products and requirement from the private sectors in this country, for upgrading quality of products for domestic consumption particularly traditional products.

(2) Financial Aspect

Budget of FTDI and FIQD may not increase in near future due to current severe economic situation in Thailand. Although priority of budget allocation to those organizations is not given clearly, it seems plausible that the operational budget will be maintained at the present level because of economic importance of fishery product for export.

(3) Technical Aspect

Throughout the Project, almost all counterparts have worked continuously in FTDI or FIQD and recognized the importance of GLP with strong intention to fulfill GLP system as soon as possible. This subjective improvement of Thai staff members seems to be one of the clear-cut collaborative achievements with Japanese experts in addition to their actual improvement of research and inspection capabilities.

Improvement of analytical equipment particularly for FTDI was remarkable in this Project. Most of counterparts have been trained to use and take care of those equipment properly. Although a little more experience seems to be needed to improve accuracy of analysis for certain items, it is concluded that the counterparts can technically continue a current level of research and inspection even after the Project is terminated.

III. RECOMMENDATION

1. Short-term recommendation

In order to make the project achievement more successful, following subjects should be continued in the remaining period in the order of the following priority.

(1) Review of analytical techniques

Since the results of cross check for some items were not satisfactory, the review of analytical techniques for such specific items should be carried out.

(2) Publication of bulletin

Fish Technology Research and Inspection Bulletin (volume III) should be published.

(3) Implementation of GLP

FIQD and FTDI have already introduced a specific part of GLP. Although complete accomplishment of GLP needs considerable time, it is appropriate to make effort to implement by taking into account the priority of TSI. Therefore, the organization chart of FTDI should be set up before the termination of the Project.

(4) Implementation of cross check at FTDI

Implementation of cross check is an effective way to monitor the acquirement of analytical techniques. Therefore, it is desirable to implement the cross check as much as possible.

2. Long-term recommendation

- (1) In order to assure the quality of fishery products, FIQD and FTDI have to maintain and develop their quality control techniques continuously. From this view point, it is important for them to implement method validation, proficiency test and cross check as their regular activities.
- (2) Because of the same reason mentioned above, accomplishment of GLP is also necessary. Thus both FIQD and FTDI should continue to establish GLP.
- (3) Since making tables of nutritional components of fishes and fishery products contributes to the development of analytical techniques and quality control, it is desirable to implement this activity continuously at FTDI.
- (4) It is desirable that the research bulletin will be published continuously in order to present the results of research activities.
- (5) To contribute to the quality control of fishery products in Thailand, it is desirable for Thai side to make effort for maintaining the budget for FIQD and FTDI.
- (6) The machinery and equipment including those provided by Japan should be maintained in a good condition.

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LIST OF ANNEX

1. PDM for Evaluation
2. Achievement of Input
(Japanese side)
 - 2-1. Dispatch of long-term expert
 - 2-2. Dispatch of short-term expert
 - 2-3. Training of Thai counterpart personnel in Japan
 - 2-4. Budget for provision of machinery and equipment
 - 2-5. Local expenditure
(Thai side)
 - 2-6. Budget allocation
 - 2-7. Allocation of counterpart personnel
3. Achievement of Activities
 - 3-1. Summary
 - 3-2. Details
4. List of seminar and workshop
5. List of publications
6. List of individual research projects
7. List of provided machinery and equipment

1. PDM for Evaluation

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal: Assure consumers including importers that fishery products of Thailand have been processed in an appropriate and wholesome manner.</p>	<ul style="list-style-type: none"> • Factories which come up to the standard of HACCP are increased • The rate of products for export, which do not pass the inspection, is decreased. • Occurrence of food poisoning is decreased. 	<ul style="list-style-type: none"> • Materials of FIQD • Information from private sector 	
<p>Project Purpose: Improve the technique concerned with the quality control of fishery products, before, during, and after processing.</p>	<ul style="list-style-type: none"> • The number of staff trained for analytical procedures is increased. • Manual for analysis is developed. 	<ul style="list-style-type: none"> • Materials of FIQD and FTDI • Interview survey 	Standards and items of inspection are not changed.
<p>Outputs:</p> <p>1. Some techniques of FIQD in analyzing contaminants/additives in fishery products are strengthened.</p> <p>2. The research activities of FTDI in analyzing contaminants/additives in fishery products are strengthened.</p> <p>3. The factory inspection system for quality control of fishery products is improved.</p>	<ul style="list-style-type: none"> • Number and scope of technologies introduced. • Number of inspection items and frequency of inspection cases • Analysis becomes more accurate. • Introduction of GLP • Equipment for analysis is upgraded. • Number and scope of research theme. • Number of publication. • Standardized techniques for analysis are increased • Analysis becomes more accurate. • Introduction of GLP • Equipment for research is upgraded. • GMP manuals are prepared. • HACCP plans are prepared. 	<ul style="list-style-type: none"> • Materials of FIQD • Carrying out of cross check • Materials of FTDI • Carrying out of cross check • Materials of FTDI 	<ul style="list-style-type: none"> • Budget for maintenance & Operation is continuously allocated. • The cooperation between FIQD and FTDI is kept.
<p>Activities:</p> <p>1-1. Introduce some analysis technologies, assure of accuracy, and conduct research on quality evaluation and quality control at FIQD.</p> <p>1-2. Carry out research on quality improvement of fish processing factories based on the technology developed at FIQD.</p> <p>2-1. Introduce some analysis technologies, assure of accuracy, and conduct research on quality evaluation and quality control at FTDI</p> <p>2-2. Carry out research on safety of fishery products based on the technology developed at FTDI.</p> <p>3-1. Prepare plans of HACCP and GMP.</p> <p>3-2. Carry out extension activities based on the above results.</p>	<p>Inputs:</p> <p>[Japan side]</p> <p>Long term expert : 3 experts including leader and coordinator. Short term expert : 3 experts per year for 5 years on the specified fields</p> <p>Equipment provision : equipment for analysis, inspection and experiment; vehicles, etc. Total amount ¥ 176 million</p> <p>C/P training in Japan: 3 persons per year for 5 years Provision of project cost: A total of ¥ 28 million (Sum of expenses for project activities, extension work, technical exchange, etc.)</p> <p>[Thai side]</p> <p>Provision of research facilities : The facilities of FTDI and FIQD Budget : Cost for research activities and operation & management Human resource : Counterparts and staff for operation & management Equipment : Equipment which is not supplied by Japan, and consumables</p>	<ul style="list-style-type: none"> • C/P works continuously. • Transportation procedures to clear the customs are not much delayed. <p>Preconditions</p>	

2. Achievement of Input

(Japanese Side)

2-1 Dispatch of Long-term Expert

Long-term Experts	Period of duties
① Team Leader (Microbiological Examination & Plant Inspection) Mr. Makoto YAMAGATA Mr. Seiro SAITO	1 Aug. 1994 - 31 Aug. 1997 19 Aug. 1997 - 1 Apr. 1999
② Chemical Analysis Mr. Ryo KIKUCHI Mr. Ryuichi MATSUDAIRA	16 Sep. 1994 - 15 Mar. 1997 1 Jun. 1997 - 1 Apr. 1999
③ Project Coordinator Mr. Kaneyasu IDA Mr. Etsuo SAITO	1 Apr. 1994 - 15 May 1997 1 May 1997 - 1 Apr. 1999

2-2 Dispatch of Short-term Expert

Short-term Experts	Period of duties	Title/Organization
① Fiscal Year 1994/95 Microbiological Examinations Mr. Kiichi TOKUOKA	17 Oct. - 23 Dec. 1994	Director, Japan Frozen Foods Inspection Corporation
Plant Inspection Mr. Masahiko SHIMADA	12 Nov. '94 - 11 Jan. '95	Researcher Maruha Corporation
Biotoxin Analysis Dr. Yoshio ONOUE	11 Mar. - 12 Apr. 1995	Professor, Dept. of Fisheries Kagoshima University
② Fiscal Year 1995/96 Heavy Metal Analysis Mr. Kazunori TAKAKURA	1 Aug. - 31 Aug. 1995	Inspector, Japan Frozen Foods Inspection Corporation
Antibiotic Analysis by HPLC Mr. Shozo HORII	9 Oct. - 30 Nov. 1995	Chief Researcher, Tokyo Metropolitan Research Laboratory of Public Health
Biotoxin Analysis Dr. Osamu ARAKAWA	1 Dec. - 31 Dec. 1995	Assistant Professor Kagoshima University

Short-term Experts	Period of duties	Title/Organization
③ Fiscal Year 1996/97 Pesticide Residue Analysis Mr. Kozo ITO	1 Jun. - 29 Jun. 1996	Inspector, Japan Frozen Foods Inspection Corporation
Vitamin Analysis Dr. Takashi MATSUI	16 Jan. - 5 Mar. 1997	Lecturer, Graduate School of Tokyo University
Retort Pouch Plant Inspection Mr. Kenjiro ISHII	26 Mar. - 3 May 1997	Senior Researcher, Maruha Corporation
④ Fiscal year 1997/98 Pesticide Residue Analysis Mr. Kozo ITO	30 Aug. - 30 Sep. 1997	Inspector, Japan Frozen Foods Inspection Corporation
Parasite Inspection in Fish Mr. Iwao MURATA	28 Sep. - 31 Oct. 1997	Executive Manager, Tokyo Metropolitan Research Laboratory of Public Health
Shelf-life Prediction by ASLT Mr. Yoshifumi NAKAMURA	26 Mar. - 26 Apr. 1998	Consultant, Japan Excellent Management Co., Ltd.
⑤ Fiscal year 1998/99 Physical Properties of Surimi Dr. Hiroyasu OKA	15 Jul. - 30 Sep. 1998	Researcher, Ehime Industrial Research Center
Biotoxin Analysis Dr. Osamu ARAKAWA	4 Aug. - 2 Oct. 1998	Assistant Professor Kagoshima University
Pesticide Residue Analysis Mr. Hajime TAGATA	10 Oct. - 28 Nov. 1998	Inspector, Japan Frozen Foods Inspection Corporation

2-3 Training of Thai Counterpart Personnel in Japan

Name & Subject	Period of Training	Training Organization
① Fiscal Year 1994/95 Biotoxin & Pesticide Analysis Ms. Supapun Brillantes	(FIQD) 24 Oct. - 28 Dec. 1994	Tohoku University Japan Frozen Foods Inspection Corporation
Microbiological Analysis Ms. Kanokphan Srimanobhas	(FIQD) 7 Feb. - 15 Mar. 1995	Tokyo Metropolitan Research Laboratory of Public Health
Quality Control & Packaging Ms. Varatip Somboonyarithi	(FTDI) 7 Feb. - 15 Apr. 1995	Kyoto University Maruha Corporation

Name & Subject	Period of Training	Training Organization
② Fiscal Year 1995/96 Food Additives Analysis Ms. Porathip Kiatkungwalkrai	(FTDI) 20 Jun. - 19 Sep. 1995	Japan Canned Food Inspection Association
Plant Inspection Ms. Suwimon Keerativiriyap.	(FIQD) 17 Oct. - 20 Dec. 1995	Japan Canned Food Inspection Association
Heavy Metals & Antibiotics Ms. Supanoi Suntipiriyaporn	(FIQD) 30 Jan. - 3 May 1996	Japan Frozen Foods Inspection Corporation/ Tokyo Metropol. Research Laboratory of Public Health
③ Fiscal Year 1996/97 Vitamin Analysis Ms. Pantip Suwansakornkul	(FTDI) 7 May - 7 Aug. 1996	Japan Canned Food Insp. Asso. Kochi University
Quality Control of Surimi Ms. Orawan Kongpun	(FTDI) 28 May - 20 Aug. 1996	Nagasaki University Kochi University
Pesticide Residue Analysis Ms. Sune Vicharnnikornkit	(FTDI) 6 Aug. - 2 Nov. 1996	Public Health Laboratory of Chiba Prefecture
④ Fiscal year 1997/98 Pathogenic Bacterial Exam. Ms. Supaporn Warotaipan	(FTDI) 27 May - 23 Aug. 1997	Public Health Lab of Chiba P Tokyo Metropol. Public Health
Extraction of Chitin/Chitosan Mr. Bordin Ittipong	(FTDI) 29 Jul. - 8 Oct. 1997	Kitazato University
Sensory Examination Ms. Krissana Soponpong	(FIQD) 31 Mar. - 2 Jul. 1998	Japan Frozen Foods Insp. Corp Japan Insp. Assoc. of Food and Food Industry Environment Ochanomizu Women's Univ.
⑤ Fiscal year 1998/99 Virus Identification Ms. Niracha Wongchinda	(FTDI) 30 Jun. ~ 30 Sep. 1998	Tokyo Metropolitan Research Laboratory of Public Health
Flavor and Aroma Analysis Ms. Jirawan Yamprayoon	(FTDI) 1 Sep. ~ 14 Nov. 1998	Ochanomizu Women's Univ.
Inspect. Methods of Biotoxin Ms. Wararat Samosorn	(FIQD) 29 Sep. ~ 29 Dec. 1998	Japan Frozen Foods Inspection Corporation Kagoshima University

2-4 Budget for Provision of Machinery and Equipment

The main machinery and equipment provided by Japanese government through the Project were analytical equipment, laboratory equipment, office equipment and so on. The amount of the budget of each year is as follows. All equipment which were more than B.25,000 and were provided to both FTDI and FIQD are listed in separate papers (Annex 7) ;

Japanese Fiscal Year : April ~ March

Unit : Yen

Fiscal Year	1994/95	1995/96	1996/97	1997/98	1998/99	Total
Amount	58,560,000	36,616,000	42,376,000	27,800,000	11,000,000	176,352,000

2-5 Local Expenditure

Japanese Fiscal Year : April ~ March

Unit : Yen

Fiscal Year	1994/95	1995/96	1996/97	1997/98	1998/99	Total
General Expenses	4,500,000	4,500,000	4,500,000	4,533,000	*6,788,000	23,408,000
Extension/Dissemin.					2,100,000	3,513,000
Technical Exchange					950,746	950,746
Total	4,500,000	4,500,000	4,500,000	4,533,000	9,838,746	27,871,746

* The amount includes the supplementary expenses of ¥2,900,000 which is a part of the revised budget decided by the Japanese government for urgent aid to the Asian countries facing the economic difficulties.

**2-6 Budget Allocation
(Thai Side)**

Thai Fiscal Year : October ~ September

FTDI

Unit : Baht

Item/ year	1 9 9 3 / 9 4	1 9 9 4 / 9 5	1 9 9 5 / 9 6
Salary	6,999,600	7,571,883	8,549,300
Expense/ Equipment	*1 9,789,400	*2 8,076,000	*3 7,465,700
Total	16,789,000	15,647,883	16,015,000
1 9 9 6 / 9 7	1 9 9 7 / 9 8	1 9 9 8 / 9 9	Total
9,220,500	9,538,400	10,791,320	52,671,003
*4 10,408,550	6,020,400	6,340,200	48,100,250
19,629,050	15,558,800	17,131,520	100,771,253

*1 : Excluding 12.0 million Baht of construction cost for a new building (Plodrasap Bldg.).

*2 : Excluding 24.0 million Baht of construction cost for the above building.

*3 : Excluding 55.8 million Baht of construction cost for the building.

*4 : Excluding 96.6 million Baht of construction cost for the building.

FIQD

Unit : Baht

Item/ year	1 9 9 3 / 9 4	1 9 9 4 / 9 5	1 9 9 5 / 9 6
Salary	8,533,900	10,671,100	15,536,160
Expense/ Equipment	15,059,400	35,878,700	52,449,790
Total	23,593,300	46,549,800	67,985,950
1 9 9 6 / 9 7	1 9 9 7 / 9 8	1 9 9 8 / 9 9	Total
19,423,700	18,693,387	19,616,680	92,474,927
27,568,840	13,837,800	14,696,100	159,490,630
46,992,540	32,531,187	34,312,780	251,965,557

2-7 Allocation of counterpart Personnel

October 1998

	Fiscal Year C/P Name Month	Counterpart Allocation					Training Institute/Year
		1994年	1995/96	1996/97	1997/98	1998/99	
		4 7 10 1	4 7 10 1	4 7 10 1	4 7 10 1	4 7 10 1	
M i c r i o l o g i c a l E x a m	F T D I	Ms. Niracha Wongchinda	Tokyo Metropolit. Res. Lab of Public. Health June 30 ~ September 30, 1998
		Ms. Preeda Methatip	Public Health Laboratory of Chiba Prefecture Tokyo Metropolit. Res. Lab of Public. Health May 27 ~ August 23, 1997
		Ms. Supaporn Warotaiapun	Tokyo Metropolit. Res. Lab of Public. Health February 7 ~ March 15, 1995
		Ms. Kanokphan Srimanobhas	
		Ms. Suchada Masae	
		Ms. Passarapa Saranakomkul	
		Ms. Roongnapa Wongwaipairote	
		Ms. Wararat Samosorn	Kagoshima University/Japan Frozen Foods Inspection Corporation, Fukuoka Station September 29 ~ December 29, 1998
		Ms. Kanokorn Kanapornworakarn	
		Ms. Orawan Konggun	Nagasaki University and Kochi University May 28 ~ August 20, 1996
C h e m i c a l	F T D I	Ms. Suneewicharnnikornkit	Public Health Laboratory of Chiba Prefecture August 6 ~ November 2, 1996
		Ms. Pantip Suwansakornkul	Japan Canned Food Inspection Association Kochi University May 7 ~ August 7, 1996
		Ms. Porathip Kiattkungwankrai	Japan Canned Food Inspection Association June 20 ~ September 19, 1995
			

C / P Name Month	Fiscal Year	Counterpart Allocation												Training Institute/Year				
		1994年			1995/96			1996/97			1997/98				1998/99			
		4	7	10	1	4	7	10	1	4	7	10	1		4	7	10	1
Dr. Jirawan Yamprayoon																		Ochanomizu Women's University September 1 ~ November 14, 1998
Dr. Attaya Kungsuwan																		
Mr. Bordin Ittipong																		Kitazato University July 29 ~ October 8, 1997
Ms. Supapan Brilliantes																		Tohoku University/Japan Frozen Foods Inspection Corporation October 24 ~ December 28, 1994
Ms. Supanoi Santipriyaporn																		Tokyo Metropolit. Res. Lab of Public. Health Japan Frozen Foods Inspection Corporation January 30 ~ May 3, 1996
Ms. Pensri Boonruang																		
Ms. Varatip Somboonyanithi																		Kyoto University, Maruha Corporation February 7 ~ April 15, 1995
Ms. Remgrudee Pruthiarenun																		
Mr. Montri Kritsaneephaiboon																		
Ms. Siriak Suwanrangsi																		
Ms. Suwimon Keerativiriyaporn																		Japan Canned Food Inspection Association October 17 ~ December 20, 1995
Ms. Krissana Sophonpong																		Japan Insp. Assoc. of Food and Food Ind. Env. Ochanomizu Women's University Japan Frozen Foods Inspection Corporation March 31 ~ July 2, 1998
Ms. Kingdwan Somjit																		

3. Achievement of Activities

3-1 Summary

Activities	Main Contents
<p>1-1/2-1 Introduce some analysis technologies, assure accuracy, and conduct research on quality evaluation and quality control at FIOD and FTDI</p> <p>(1) Technologies transfer of inspection and analysis for fishery products.</p> <p>(2) Establishment of inspection and laboratory assurance system by implementing comprehensive Good Laboratory Practice (GLP).</p> <p>(3) Research studies on quality evaluation and quality control for fishery products.</p>	<p>(1)-1 Acquisition of analytical methods on related microorganisms, such as fungi, bacteria and virus.</p> <p>2 Acquisition of analytical methods on contaminants, additives, and related chemical and physical fields, such as food additives, heavy metals, pesticide residues, antibiotics, chemical contaminants, nutritional components, quality evaluation indices and physical properties.</p> <p>3 Acquisition of analytical methods on related biological field, such as natural toxins and parasites.</p> <p>(2)-1 Management of laboratory facilities, equipment and reagents.</p> <p>2 Validation for inspection and analytical methods.</p> <p>3 Internal inspection.</p> <p>4 Audit.</p> <p>5 Participation for cross-check.</p> <p>(3)-1 Research studies on mechanism of deterioration and quality management of fishery products.</p> <p>2 Establishment of quality evaluation indices and development of measurement methodology for fishery products.</p> <p>3 Research studies on the shelf-life of fishery products based on quality evaluation indices.</p>
<p>1-2 Carry out research on quality improvement of fish processing factories based on the technology developed at FIOD.</p> <p>(1) Study on the freshness of fishery products.</p> <p>(2) Study on harmful micro-organisms in fishery products.</p> <p>2-2 Carry out research on safety of fishery products based on the technology developed at FTDI.</p> <p>(1) Implementation of monitoring.</p> <p>(2) Development of technologies for underutilized fishery resources.</p> <p>(3) Research study on freshness preservation of fishery products.</p>	<p>(1)-1 Establishing a guide to the grading of seafood freshness.</p> <p>2 Study on factors affecting decomposition of canned shrimp.</p> <p>(2)-1 Detection of <i>Clostridium perfringens</i> and Enterotoxins.</p> <p>2 Identification and isolation of pathogenic bacteria in fermented and salted fish products.</p> <p>(1)-1 Monitoring on biotoxin, food additives, heavy metals, pesticide residues and so on.</p> <p>2 Preparation of nutritional component tables of several valuable fish in Thailand.</p> <p>(2)-1 Study to improve quality of lizard fish surimi.</p> <p>2 Study of digestibility of fish powder and fish meal.</p> <p>3 Study on fishery products in retort pouched packaging.</p> <p>(3)-1 Study on shell-life of fishery processing products.</p> <p>2 Effects of temperatures on post-mortem chemical and microbiological changes in shrimp species.</p> <p>3 Study on various types of packaging concerning freshness preservation.</p>
<p>3-1 Prepare plans of HACCP and GMP.</p> <p>(1) Implementation of GMP.</p> <p>(2) Implementation of HACCP.</p> <p>3-2 Carry out extension activities based on the above results.</p> <p>(1) Technological improvement of inspectors and analysts.</p> <p>(2) Providing information concerning the safety of fishery products from hazards to fisherman, processors and consumers.</p> <p>(3) Publication of research bulletin.</p> <p>(4) Establishment of information network.</p>	<p>(1)-1 Preparation of GMP manuals for some fishery industries.</p> <p>2 Guidance of GMP implementation.</p> <p>(2)-1 Preparation of HACCP plan for some fishery products.</p> <p>2 Guidance of HACCP planning.</p> <p>(1)-1 Holding seminars and workshops in relation to the quality control of fishery products.</p> <p>2 Security of the importing countries' credibility for the proper inspection and analytical methods on the Thai export fishery products.</p> <p>(2)-1 To provide information of food hazard and hygienic control for fishery products through the publication, such as posters, leaflets and text books.</p> <p>(3)-1 To continue the publication of the research bulletin.</p> <p>(4)-1 To provide information on the Internet home pages.</p>

3 - 2. DETAILS

(1 - 1/2 - 1) Introduce some Analysis Technologies, assure of Accuracy, and Conduct Research on Quality Evaluation and Quality Control at FIQD & FTDI

Activities	Contents	*
1) Microbiological Examination ① <i>Escherichia coli</i> ② <i>Escherichia coli</i> 0-157:H7 ③ <i>Staphylococcus aureus</i> ④ <i>Salmonella group</i> ⑤ <i>Bacillus cereus</i> ⑥ <i>Vibrio parahaemolyticus</i> ⑦ <i>Vibrio cholerae</i> ⑧ <i>Listeria monocytogenes</i> ⑨ <i>Clostridium botulinum</i> ⑩ <i>Clostridium perfringens</i>	TT by LE/SE → SOP → LT MR CC TT by LE/SE → C/P TJ TT by LE/SE → SOP → LT MR CC TT by LE/SE → C/P TJ → SOP → LT MR CC TT by LE/SE → C/P TJ → CC TT by LE/SE → C/P TJ → LT MR TT by LE/SE → C/P TJ → LT TT by SE → C/P TJ TT by SE → C/P TJ → LT MR TT by SE → C/P TJ → MR	◎ ☆ ◎ ◎ ☆ ◎ ☆ ◎ ☆ ◎ ☆ ◎ ☆ ◎ ☆ ◎ ☆ ◎ ☆ ◎ ☆
2) Chemical Analysis ① Food Additives ① Benzoic acid ② Sorbic acid ③ BHA ④ BHT ⑤ TBHQ ⑥ Sulfur dioxide (SO ₂) ⑦ Artificial color ⑧ Sodium nitrate (NaNO ₂) ⑨ EDTA ⑩ Polyphosphate ⑪ Saccharin ⑫ Ascorbic acid ⑬ Citric acid ⑭ Lactic acid ⑮ Chlorine (Cl ₂) ② Pesticide Residues ① BHC ② DDT ③ Dorins ④ DDVP ⑤ DEP	TT by LE → C/P TJ → LT MR CC TT by LE → C/P TJ → LT MR CC TT by C/P TJ TT by C/P TJ TT by C/P TJ TT by LE → C/P TJ TT by C/P TJ TT by C/P TJ TT by LE → C/P TJ → LT TT by LE → SOP → LT TT by C/P TJ TT by C/P TJ TT by C/P TJ TT by C/P TJ TT by C/P TJ TT by LE/SE → C/P TJ → MR TT by LE/SE → C/P TJ → MR TT by LE/SE → C/P TJ → MR TT by LE/SE → C/P TJ → MR TT by LE/SE → C/P TJ → MR	◎ ◎ ◎ ◎ ◎ ☆ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ◎ ☆ ◎ ☆ ◎ ◎ ◎

* ◎ : Implemented at FTDI
 ☆ : Implemented at FIQD

Abbreviations ; TT: Technical Transfer, LE: Long-term Expert, SE: Short-term Expert, C/P: Counterpart, TJ: Training in Japan, SOP: Standard Operating Procedure
 LT: Laboratory Test, MR: Monitoring, CC: Cross-check.

Activities	Contents	*
③ Heavy Metals		
① Inorganic mercury (Hg)	TT by SE → C/P TJ → CC LT	◎ ☆
② Organic mercury (Hg)	TT by SE → C/P TJ	◎ ☆
③ Cadmium (Cd)	TT by SE → C/P TJ → CC LT	◎ ☆
④ Lead (Pb)	TT by SE → C/P TJ → CC LT	◎ ☆
⑤ Arsenic (As)	TT by LE → C/P TJ	☆
⑥ Tin (Sn)	TT by SE → C/P TJ	◎ ☆
⑦ Zinc (Zn)	TT by SE → C/P TJ	◎ ☆
⑧ Copper (Cu)	TT by SE → C/P TJ	◎ ☆
④ Antibiotics		
① Tetracycline	TT by SE → C/P TJ → LT CC	◎ ☆
② Penicillins	TT by SE → C/P TJ	◎ ☆
③ Chloramphenicols	TT by SE → C/P TJ	◎ ☆
④ Sulfonamide	TT by SE → C/P TJ	☆
⑤ Quinolines	TT by SE → C/P TJ	☆
⑥ Oxolenic acid	TT by SE → C/P TJ → LT, CC	☆
⑤ Chemical Contaminant		
① PCBs	TT by SE → C/P TJ	◎ ☆
⑥ Nutritional Components		
① Moisture	TT by LE → CC	◎
② Protein	TT by LE → CC	◎
③ Fat	TT by LE → CC	◎
④ Fiber	TT by LE → CC	◎
⑤ Ash	TT by LE → CC	◎
⑥ Iron	TT by LE → CC	◎
⑦ Phosphorus	TT by LE → CC	◎
⑧ Calcium	TT by LE → CC	◎
⑨ Iodine	TT by LE → CC	◎
⑩ Retinol	TT by LE → CC → C/P TJ	◎
⑪ Carotene	TT by LE → C/P TJ	◎
⑫ Vitamin B1	TT by LE/SE → CC → C/P TJ	◎
⑬ Vitamin B2	TT by LE/SE → CC → C/P TJ	◎
⑭ Niacin	TT by LE/SE → CC → C/P TJ	◎
⑮ Vitamin C	TT by LE/SE → CC → C/P TJ	◎
⑯ Vitamin E	TT by LE → CC → C/P TJ	◎
⑰ Fatty acid components	TT by LE → CC	◎
⑱ Cholesterol	TT by LE → C/P TJ	◎
<p>*Abbreviations ; TT: Technical Transfer, LE: Long-term Expert, SE: Short-term Expert, C/P: Counterpart, TJ: Training in Japan, LT: Laboratory Test, MR: Monitoring, CC: Cross-check.</p> <p>* ◎ : Implemented at FTDI ☆ : Implemented at FIQD</p>		

Activities	Contents	*
<p>3) Biological Examination</p> <p>① Natural toxins</p> <p>① P S P</p> <p>② D S P</p> <p>③ A S P</p> <p>④ T T X</p> <p>② Bioassay of Antibiotics</p> <p>① Tetracycline</p> <p>② Penicillins</p> <p>③ Macrorides</p> <p>④ Aminoglycosides</p> <p>③ Bioassay of Vitamin</p> <p>① Pantothenic acid</p> <p>④ The others</p> <p>① Parasites</p>	<p>TT by SE → C/P TJ → MR LT</p> <p>TT by SE → C/P TJ</p> <p>TT by SE → C/P TJ</p> <p>TT by SE → C/P TJ → MR LT</p> <p>TT by SE → C/P TJ → LT → SOP</p> <p>TT by SE → C/P TJ → LT → SOP</p> <p>TT by SE → C/P TJ → LT → SOP</p> <p>TT by SE → C/P TJ → LT → SOP</p> <p>TT by C/P TJ</p> <p>TT by SE → MR</p>	<p>◎ ☆</p> <p>◎ ☆</p> <p>◎ ☆</p> <p>◎ ☆</p> <p>◎ ☆</p> <p>◎ ☆</p> <p>◎ ☆</p> <p>◎ ☆</p> <p>◎</p> <p>◎ ☆</p>
<p>4) Comprehensive GLPs</p> <p>① Organization Chart</p> <p>② Organization of Responsibility</p> <p>③ Layout of Laboratory</p> <p>④ Facility Management</p> <p>⑤ SOP for Treatment of Samples</p> <p>⑥ SOP for Reagents and Standards</p> <p>⑦ SOP for Analytical Methods</p> <p>⑧ SOP for Maintenance of Equipment</p> <p>⑨ SOP for Management of Testing Animals</p> <p>⑩ SOP for Laboratory Waste Management</p> <p>⑪ SOP for Dangerous, Hazardous Substances and High-Pressure Gas Management</p> <p>⑫ SOP for Audit</p> <p>⑬ SOP for Internal Inspection</p> <p>⑭ SOP for Proficiency Tests</p> <p>⑮ SOP for Accreditation</p> <p>* ◎ : Implemented at FTDI</p> <p>☆ : Implemented at FIQD</p>	<p>Drawing of Organization Chart (FIQD)</p> <p>Drawing (FIQD)</p> <p>Drawing of Facility Layout (FTDI)</p> <p>Preparation of SOP</p> <p>Abbreviations ; TT: Technical Transfer, LE: Long-term Expert, SE: Short-term Expert, C/P: Counterpart TJ: Training in Japan, SOP: Standard Operating Procedure LT: Laboratory Test, MR: Monitoring, CC: Cross-check.</p>	<p>☆</p> <p>☆</p> <p>◎</p> <p>◎ ☆</p> <p>◎</p> <p>◎</p> <p>◎</p>

Activities	Contents	*
<p>5) Quality Evaluation and Quality Control</p> <p>① Quality Evaluation</p> <p>① Histamine</p> <p>② K-Value</p> <p>③ Volatile basic nitrogen</p> <p>② Physical Tests</p> <p>① Gel strength</p> <p>② Color difference</p> <p>③ Electrophoresis</p> <p>③ The others</p> <p>① Chitin</p> <p>② Chitosan</p> <p>* ◎ : Implemented at FTDI ☆ : Implemented at FIQD</p>	<p>TT by LE → Appl. to the Research → LT</p> <p>TT by LE → Appl. to the Research</p> <p>TT by LE → Appl. to the Research → LT</p> <p>TT by LE → C/P TJ → Appl. to the Res.</p> <p>TT by SE → C/P TJ → Appl. to the Res.</p> <p>TT by SE → C/P TJ → Appl. to the Res.</p> <p>TT by C/P TJ</p> <p>TT by C/P TJ</p> <p>*Abbreviations ; TT: Technical Transfer, LE: Long-term Expert, SE: Short-term Expert, C/P: Counterpart TJ: Training in Japan, Appli. : Application Res. : Research</p>	<p>◎</p> <p>◎</p> <p>◎</p> <p>◎</p> <p>◎</p> <p>◎</p> <p>◎</p> <p>◎</p>

(1 - 2) Carry out Research on Quality Improvement of Fish Processing Factories based on the Technology Developed at FIQD

Activities	Contents
<p>1) Study on the Freshness of Fishery Products</p> <p>① Establishing a Guide to the Grading of Seafood Freshness.</p> <p>② Factor affecting Decomposition in Canned Shrimp.</p> <p>2) Study on harmful Micro-organism in Fishery Products.</p> <p>① Detection of <i>Clostridium perfringens</i> and Enterotoxins.</p> <p>② Identification and isolation of pathogenic bacteria in fermented and salted fish products.</p>	<p>Indiv. Res. PJ → Printed in the Bulletin</p> <p>Indiv. Res. PJ → Printed in the Bulletin</p> <p>Indiv. Res. PJ → Monitoring</p> <p>Indiv. Res. PJ → Printed in the Bulletin</p> <p>Abbreviations ; Indiv : Individual, Res. : Research PJ : Project</p>

(2 - 2) Carry out Research on Safety of Fishery Products based on the Technology developed at FTDI

Activities	Contents
1) Implementation of Monitoring ❶ Biotoxin in Fish and Crustacean ① Toxic Freshwater Puffer Fish ② Toxic Horseshoe Crab ❷ Food Additives in Fishery Products ① Benzoic Acid in Fish ball ② Sorbic Acid in Fish ball ❸ Heavy Metals in Fish ① Lead ② Cadmium ③ Inorganic Mercury ❹ Pesticide Residue in Fishery Products ① Organochlorine Pesticides ② Organophosphorus Pesticides ❺ Tables of Nutritional Components ① Tables of Valuable Freshwater Fish in Thai.	MR → Printed in the Bulletin and "Toxicon" MR → Printed in "Fishery Gazette" MR → Printed in the Bulletin MR → Printed in the Bulletin MR on Cephalopod → Bulletin MR on Cephalopod → Bulletin MR on Cephalopod → Bulletin MR → Printed in the Bulletin MR → Printed in the Bulletin Preparing for 15 species of Fish → CC
2) Development of Technologies for Underutilized Fishery Resources. ❶ Study to improve Quality of Lizard Fish surimi ❷ Study of digestibility of Fish Powder and Fish Meal.	Indiv. Res. PJ → Printed in the Bulletin Indiv. Res. PJ → Joint PJ and Royal PJ
3) Research study on freshness preservation of Fishery Products. ❶ Study on Shelf-life of Fishery Processing Products. ❷ Effects of Temperatures on Post-mortem Chemical and Microbiological changes in Sand Shrimp. ❸ Study on Fishery Products in Retort Pouched Packaging.	Indiv. Res. PJ → LT Indiv. Res. PJ → Printed in the Bulletin Indiv. Res. PJ → Printed in the Bulletin

(3 - 1) Prepare Plans of HACCP and GMP

Activities	Contents
<p>1) Implementation of GMP</p> <p>① Preparation of GMP manuals for some fishery industry.</p> <p>② Guidance of GMP implementation.</p> <p>2) Implementation of HACCP</p> <p>① Preparation of HACCP plan for some fishery products.</p> <p>② Guidance of HACCP planning.</p>	<p>Published 「Operating Practice for Frozen Fishery Product Processors」 in 1994</p> <p>Published 「Guidelines for Approval of Fish Processing Establishment」 in 1996 and 「Operating Practice for Seafood Canneries」 in 1997</p> <p>Guidance by both long-term and short-term experts. Preparation of HACCP plans for fish sauce, dried shrimp and frozen surimi, and manual of quality control for retort pouched fishery products.</p> <p>Since 1995, guidance of FIQD started to the domestic exporting fish processing plants. Published 「Fish and Fishery Products HACCP Program」 in January of 1996.</p>

(3 - 2) Carry out Extension Activities based on the Above Results

Activities	Contents
<p>(1) Technological Improvement of Inspectors and Analysts.</p> <p>❶ Holding of seminars and workshops in relation to the quality control of fishery products.</p> <p>❷ Security of importing countries' credibility for the proper inspection and analytical methods on the Thai export fishery products.</p> <p>(2) Providing Useful Information Concerning the Safety of Fishery Products to Fishermen, Processors and Consumers.</p> <p>❶ To provide information of food hazard and hygienic control for fishery products through the publication, such as posters, leaflets and text books</p> <p>(3) Publication of Research Bulletin.</p> <p>❶ To continue the publication of the research bulletin.</p> <p>(4) Establishment of Information Network.</p> <p>❶ To provide information on the internet home pages.</p>	<p>Details are referred to Annex 4.</p> <p>Conducted internal cross checking in FTDI and each station under FIQD, such as Bangkok, Samutsakorn, Suratthani and Songkhla. Taking counterpart personnel to Singapore to exchange technical views each other by JICA special budget. Visited MFRD/SEAFDEC and the laboratory of Ministry of Primary Resources.</p> <p>Printed several kinds of poster, such as personal hygiene in fish processing company, toxic horseshoe crab and toxic freshwater puffer fish. Details are referred to Annex 5.</p> <p>Volume 1 of FTDI and FIQD's Research Bulletin, 「Fish Technology Research & Inspection」 published November of 1997. Volume 2 was in March of 1998. Volume 3 is expected to be published before the end of Project in March of 1999.</p> <p>Both FTDI and FIQD's home pages are now accessible. Preparation of Video for introduction of FTDI's activities is under consideration.</p>

4. List of Seminar and Workshop

Activity	Details	Date (period)	No. of Particip.
<u>Seminar & Workshop in 1994/95</u>			
Seminar on Marine Toxins (FTDI)	The aim is to provide information on marine toxins in Thailand for DOF staff, local researchers/manufacturers. Topics are; red tide, food poisoning caused by shellfish, chemical feature of toxins.	Mar. 17, 1995	Apprx. 85
Workshop on Antibiotic Residue Determination Methods (FIQD)	The workshop was held for the manufacturers of fishery products. Following the lectures on regulations of importing countries, the determination methods of antibiotics using bioassay and HPLC were demonstrated. The participants actually experienced the determination methods.	Mar. 24~26, 1995	34
<u>Seminar & Workshop in 1995/96</u>			
Workshops on Marine Toxins Determination Methods (FTDI)	Two intensive training sessions were held to train DOF researchers for the determination of PSP & TTX using HPLC as well as mouse-assay. The participants experienced every step of the procedures using both standards and samples. The techniques have been transferred to 15 DOF staff. Basic technology transfer by JICA in this field has been completed by these workshops.	Dec. 11~16, 18~23, 1995	9 6
Seminar on Sanitation of Traditional Fishery Products Production(FTDI)	The seminar aimed providing information for the manufacturers of traditional fishery products such as fish sauce and dried fish. Topics included ; Export regulations to EU, GMP of traditional fishery products and quality control measures.	Nov. 28, 1995	Apprx. 100
Seminar on Personal Hygiene (FIQD)	The seminar was held to provide the information on personal hygiene for foremen and foreladies of fishery plants. The participants have obtained practical knowledge on personal hygiene in their plants.	Mar. 8, 1996	Apprx. 70

Activity	Details	Date (period)	No. of Particip.
<p><u>Seminar & Workshop in 1996/97</u></p> <p>Seminar on Inspection method of retort pouched fishery products and HACCP planning (FIQD)</p>	<p>In the seminar topics, such as the presentation of retort pouched foods in Japan, manufacturing and inspection methods, practice of retort pouched curry using machines and so on. Concerning planning of HACCP was also introduced by FIQD staff. Participants were from private sector and DOF staff.</p>	<p>Mar. 31~ April 4, 1997</p>	<p>23</p>
<p><u>Seminar & Workshop in 1997/98</u></p> <p>Workshop on Chemical Analysis in Fishery Products (FIQD)</p>	<p>The workshop was held to aim at providing practical techniques of chemical analysis by HPLC to the persons who are in charge of quality control in fish processing plants. Total participants were 18 persons.</p>	<p>Mar. 2 ~6, 1998</p>	<p>18</p>
<p><u>Seminar & Workshop in 1998/99</u></p> <p>Seminar on Marine Puffer Fish Identification</p>	<p>Seminar was divided into two parts, one was lecture on identification of toxic puffer fish and the other was practice of identification on toxic and non toxic puffer fish from physical appearances. Those were presented in the morning and afternoon respectively.</p>	<p>Sep. 17, 1998</p>	<p>31</p>
<p>Workshop on Biotoxin, Analytical Methods of PSP, DSP and ASP.</p>	<p>As a part of technical transfer of short-term expert, workshop on Analytical methods of biotoxin was conducted for FTDI and FIQD counterpart personnel. Techniques, such as extraction of several kinds of biotoxin, sample preparation, analysis by mouse assay and by HPLC and so on were presented.</p>	<p>Sep. 7 ~11, 1998</p>	<p>Apprx. 15</p>

5. List of Publications

Publications	Organization	Details
<u>In 1994/95</u> A Book of Research Abstracts	FTDI	No. of copies: 1,200 Distributed to other divisions and research institutes to introduce research activities at FTDI in the past 10 years.
Poster on Horseshoe crab	FTDI	No. of copies: 2,500 Distributed to DOF regional offices, research institutes, hospitals, schools, mainly in the eastern provinces where the food poisoning frequently occurs each year.
Leaflet of FIQD	FIQD	No. of copies: 3,000 Distributed to visitors, concerned authorities, research and inspection organizations.
<u>In 1995/96</u> Poster on Personal Hygiene	FTDI/FIQD	No. of copies: 1,000 Distributed to factories to provide basic information on personal hygiene for workers.
GMP and HACCP plan for Surimi Plants	FTDI	No. of copies: 100 Distributed to surimi plants.
<u>In 1996/97</u> Volume 1 of Research Bulletin, "Fish Technology Research & Inspection".	FTDI/FIQD	No. of copies: 1,000 Distributed to DOF regional offices, research stations in Thailand. And distributed to the supporters of the Project in Japan.
Poster on Toxic Freshwater Puffer Fish	FTDI	To stop the occurrence of poisoning, the poster of toxic freshwater puffer fish was distributed to DOF regional offices and research institutes.
<u>In 1997/98</u> Biotoxin Manual	FTDI	No. of copies: 30 [Analytical Methods for Biotoxins (PSP, TTX, DSP & SAP)] Distributed to limited persons.
Volume 2 of the Bulletin	FTDI/FIQD	No. of copies: 550 Published Volume 2 in March of 1998.
<u>In 1998/99</u> Volume 3 of the Bulletin	FTDI/FIQD	Volume 3 is expected to finish its printing before the end of the Project.

6. LIST OF INDIVIDUAL RESEARCH PROJECTS

Title of Research Project	Fiscal Year	Counter part	1995/1996			1996/1997			1997/1998			1998/1999		
			4	7	10	1	4	7	10	1	4	7	10	1
<u>Conducted at EIQD</u> (1) Application of Good Manufacturing Practice (GMP) on Frozen Surimi. (2) Establishing a Guideline of Grades of Seafood Freshness (3) Detecting <i>Clostridium perfringens</i> and Enterotoxin. (4) Study on Factors affecting Decomposition of Canned Shrimp (5) Process Control of Retort Pouch Seafood Products (Process Establishment and HACCP). (6) Identification and Isolation of Pathogenic Bacteria in Fermented and Salted Fish Products.		Ms. Suwimon	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	
		Ms. Krissana	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	
		Ms. Suchada/Passarapa	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	
		Ms. Krissana	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	
		Ms. Kingduan/Sirilak	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	
		Ms. Kanokphan	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	
<u>EIQL and EIQD Joint Project</u> (1) Establishing and Implementation of Standard Operating Procedure (SOP). <u>Conducted at EIDJ</u> (2) Quality Improvement of Lizard Fish Surimi. (3) Effects of Temperatures on Post-mortem chemical and Microbiological Changes in Sand Shrimp. (4) Establishing GMP Manual for Fish Sauce. (5) Establishing a Monitoring System for Harmful Heavy Metals in Fish and Fisheries Products. (6) Detecting Organochloride and Organophosphorous Pesticide Residues in Fish and Fisheries Products. (7) Survey and Monitoring on Toxicity of Horseshoe Crab.		Ms. Poonsap/Attaya Mr. Montri/Ms. Sirirak	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====		
		Ms. Orawan/Pantip	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====		
		Ms. Niracha/Mr. Sumate	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====		
		Ms. Varatip/Pantip	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====		
		Ms. Niracha/Mr. Sumate	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====		
		Ms. Sunee	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====		
		Ms. Attaya	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====		

FTDI

Title of Research Project	Fiscal Year	Counter part	1995/1996				1996/1997				1997/1998				1998/1999			
			4	7	10	1	4	7	10	1	4	7	10	1	4	7	10	1
Conducted at EIDI			-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(8) Survey and Monitoring on Toxic Freshwater Puffer Fish.		Ms. Attaya/Mr. Manoon	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(9) Storage Quality of Fish Sauce in Various Types of Packaging.		Ms. Varatip/Pantip	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(10) Study of Quality Indices Analysis Procedures Criteria of Fish Powder and Fish Meal.		Ms. Rerngrudee	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(11) Detecting Benzoic acid in Fishery Products.		Ms. Porathip	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(12) Establishing Fish Nutritional Composition.		All staff of FTDI	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(13) Preservative effect of chitosan on food.		Ms. Attaya/Mr. Bordin	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(14) Detection of Viruses in Shellfish.		Ms. Niracha	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(15) Application of Benzoic Acid and Sorbic Acid to Fish ball to determine Effective Contents.		Ms. Porathip	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(16) Development of Detection Method and Monitoring for Parasites.		Ms. Preeda	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(17) Survey and Monitoring of Boric Acid in Fishery Products.		Ms. Porathip	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(18) Shelf-Life Prediction by the Accelerated Shelf-Life Testing (ASLT) System for Fishery Products.		Ms. Varatip/Pantip	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(19) Study of Digestibility of Fish Powder and Fish Meal as a Quality Index as well as the other Quality Indices.		Ms. Rerngrudee	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
(20) Study on Fishery Products in Retort Pouched Packaging.		Ms. Vartip/Pantip	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	

7. List of Provided Machinery and Equipment (FTDI)

No. 1

No.	F. Year	JICA.No.	Name	Model	Install. Yr.	Rm.No.	Inspector
1	1994	FTV-01	Gas Chromatography	FISON GC8160	1995. 8	209	Ms. Sunee
2	1994	FTV-02	Atomic Absorption Spectrophotometer	GB C932 AB	1995. 8	310	Mr. Sumate
3	1994	FTV-03	High Speed Refrigerated Centrifuge	TOMY RS205	1995. 8	209	Ms. Pantip
4	1994	FTV-04	Wagon Car (ISUZU)	TFR 54 HYBD	1995. 3	JICA	JICA
5	1994	FTV-05	Protein Content Analyzer	Tecator 1035/1038 kjeltec	1995. 9	208	Ms. Varatip
6	1994	FTV-06	Fiber Content Analyzer	Tecator Fiber system HT6	1995. 9	112	Ms. Porathip
7	1994	FTV-07	Spectrophotometer	GB C918 UV-VIS	1995. 9	316	Ms. Varatip
8	1994	FTV-08	Growth Chamber	Model TG520HD	1995. 9	107	Ms. Niracha
9	1994	FTV-09	Freeze Dryer	HETO FD-8-3	1996. 2	116	Ms. Attaya
10	1994	FTX-01	Automated Mercury Analyzer	LEEMAN LAB PS200	1995. 8	310	Ms. Niracha
11	1994	FTX-02	Automated High Speed Autoclave	TOMY Seiko vertical type	1995. 8	312	Mr. Bordin
12	1994	FTX-03	Low Temperature Incubator	HOTPACK Model 352602	1995. 8	313	Mr. Bordin
13	1994	FTX-04-1	Deep Freezer	REVOO ULT2050-5V	1995. 8	107	Ms. Niracha
14	1994	FTX-04-2	Deep Freezer	REVOO ULT2050-5V	1995. 8	112	Ms. Niracha
15	1994	FTX-05	Copy Printer	GESTETNER 5330	1995. 3	302	Ms. Somprasong
16	1994	FTX-06	Fat Content Analyzer	Tecator Soxtecsystem HT6	1995. 9	112	Ms. Porathip
17	1994	FTX-07	Moisture Analyzer	Tecator 6100 Sinar IR Balance	1995. 9	112	Ms. Sunee
18	1994	FTX-08	Sample Preparation	Tecator 1094 Homogenizer	1995. 9	112	Ms. Porathip
19	1994	FTX-09	Laptop Computer	Macintosh Power Book 180C	1994. 4	205	JICA
20	1994	FTX-10	Laptop Computer	Macintosh Power Book 520C	1994. 8	206	JICA

No.	F. Year	JICA.No.	Name	Model	Install. Yr.	Rm.No.	Inspector
21	1994	FTX-11	Word Processor	CANON α -85HL	1994. 9	205	JICA
22	1994	FTX-12	Copy Machine	Nashatec 8115	1995. 3	302	Ms. Somprasong
23	1994	FTX-13	Personal Computer	LASER 486D	1995. 3	205	JICA
24	1994	FTX-14	Laptop Computer	Veridata Notebook	1995. 1	303	Ms. Attaya
25	1994	FTX-15	Mini Chemical Pump	SP-D-2502U	1995. 3	316	Mr. Bordin
26	1994	FTX-16	Bath	RB-1200	1995. 3	316	Mr. Bordin
27	1995	FTV-10	Microscope	NIKON OPTSHOT-2	1996. 8	311	Ms. Supaporn
28	1995	FTV-11	K-Value Analyzer	Shin Nihon Musen NTZ1219	1996. 8	211	Ms. Pantip
29	1995	FTV-12	Deep Freezer	Snijders	1996. 8	211	Mr. Sumate
30	1995	FTV-13	Chromameter	MINOLTA CR-300	1996. 6	201	Ms. Pantip
31	1995	FTX-17	Freezer - 30°C	SELECTA	1995. 8	314	Ms. Attaya
32	1995	FTX-18	Water Circulation Bath	EYELA CA-1100	1995. 8	111	Ms. Suneee
33	1995	FTX-19	Fume Cup Board	OSKON	1995. 1	208	Ms. Pantip
34	1995	FTX-20	Bench top Centrifuge	HETTICH	1995. 1	314	Ms. Attaya
35	1995	FTX-21	Desk top Computer	Macintosh Performa 6200	1996. 4	205	JICA
36	1995	FTX-22	Electrophoresis	Biorad	1996. 5	211	Ms. Orawan
37	1995	FTX-23	Non-bubble homogenizer	EYELA CTR-1000	1996. 5	211	Ms. Orawan
38	1995	FTX-24	Shaker	Gerhardt R02,R05	1996. 6	111	Mr. Sumate
39	1995	FTX-25	Evaporator	EYELA N-1NW	1996. 6	111	Ms. Suneee
40	1995	FTX-26	Balance	ISHIDA MT-150W	1996. 4	P. Plant	Ms. Orawan

No.	F. Year	JICA.No.	Name	Model	Install.Yr.	Rm.No.	Inspector
41	1995	FTX-27	Analytical Balance	Sartorius AC211S	1996. 4	211	Ms. Pantip
42	1995	FTX-28	pH meter	Schott gerate CG840	1996. 7	111	Ms. Pantip
43	1995	FTX-29	Centrifuge	TOMY MRX-150	1996. 7	314	Ms. Attaya
44	1995	FTX-30	Salinity tester	SINAR NS-3P	1996. 8	302	Mr. Sumate
45	1995	FTX-31	Portable thermometer	Nihon keiryoki NKD-H-44	1996. 8	201	Ms. Pantip
46	1995	FTX-32	Overhead Projector (OHP)	ELMO HP-A380	1996. 3	301	Ms. Somprasong
47	1995	FTX-33	Photo taking set	MINOLTA MT1001 Dynax	1996. 6	304, 311	Ms. Preeda
48	1995	FTX-34	Water Circulation Bath	EYELA CTR-1000	1996. 6	208	Ms. Pantip
49	1995	FTX-35	Muffle furnace	Neytech 3-1750	1996. 6	210	Ms. Pantip
50	1995	FTX-36-1	Computer	MTEC 486 DX4-100	1996. 3	202	Ms. Somprasong
51	1995	FTX-36-2	Computer	MTEC 486 DX4-100	1996. 3	309	Ms. Somprasong
52	1995	FTX-37-1	Lazer Printer	HP Jet 5P	1996. 3	202	Ms. Somprasong
53	1996	FTV-14	HPLC for Biotoxin Analysis	SHIMADZU LC-10	1997. 7	316	Mr. Bordin
54	1996	FTV-15	HPLC for Vitamin Analysis	SHIMADZU LC-10	1997. 7	316	Ms. Pantip
55	1996	FTV-16	HPLC for Food Additive Analysis	SHIMADZU LC-10	1997. 7	316	Ms. Porathip
56	1996	FTV-17	C O ₂ Incubator	HERAEUS Model BB16	1997. 7	311	Ms. Supaporn
57	1996	FTX-38-1	Ultrasonic Cleaning Bath	BRANDSON B5210E-MTm	1997. 7	111	Ms. Porathip
58	1996	FTX-38-2	Ultrasonic Cleaning Bath	BRANDSON B5210E-MTm	1997. 7	211	Ms. Varatip
59	1996	FTX-38-3	Ultrasonic Cleaning Bath	BRANDSON B5210E-MTm	1997. 7	316	Ms. Attaya
60	1996	FTX-39-1	Ultrasonic Pipette Washing	EYELA AU-150CR	1997. 7	111	Ms. Sunee

No.	F. Year	JICA.No.	Name	Model	Install. Yr.	Rm.No.	Inspector
61	1996	FTX-39-2	Ultrasonic Pipette Washing	EYELA AU-150CR	1997. 7	211	Ms. Varatip
62	1996	FTX-39-3	Ultrasonic Pipette Washing	EYELA AU-150CR	1997. 7	312	Ms. Supaporn
63	1996	FTX-40-1	Low Speed Benchtop Centrifuge	TOMY LC100	1997. 7	111	Ms. Sunee
64	1996	FTX-40-2	Low Speed Benchtop Centrifuge	TOMY LC100	1997. 7	211	Mr. Sumate
65	1996	FTX-40-3	Low Speed Benchtop Centrifuge	TOMY LC100	1997. 7	211	Ms. Orawan
66	1996	FTX-41	Mixer and Cutter	STEPHAN UM05-33	1997. 7	P. Plant	Ms. Orawan
67	1996	FTX-42-1	Magnetic Stirrer	EYELA RCH-3L	1997. 7	314	Ms. Attaya
68	1996	FTX-42-2	Magnetic Stirrer	EYELA RCH-3L	1997. 7	314	Ms. Attaya
69	1996	FTX-43	Dry Thermo Bath	EYELA MG-2100	1997. 7	211	Ms. Attaya
70	1996	FTX-44	Autoclave	TOMY SS-325	1997. 7	312	Ms. Supaporn
71	1996	FTX-45	Incubator	HOTPACK 352602	1997. 7	313	Ms. Supaporn
72	1996	FTX-46	Rotor Mill	FRITSCH Pulverisette 14	1997. 7	211	Ms. Attaya
73	1996	FTX-47	Homogenizer	NIHONSEKI AM-11	1997. 7	211	Ms. Pantip
74	1996	FTX-48	Rotary Vacuum Evaporator	EYELA N-INW	1997. 7	111	Ms. Sunee
75	1996	FTX-49	Flame Photometric Detector	FISONS FPD-800	1997. 7	209	Ms. Sunee
76	1996	FTX-50	Audiovisual Set	TOA	1997. 7	301	Ms. Somprasong
77	1996	FTX-51	Module for pH titration	SCHOTT GERATE	1997. 7	210	Ms. Rerngrudee
78	1996	FTX-52-1	Desiccator	SANPLATEC SK0007	1997. 7	111	Ms. Sunee
79	1996	FTX-52-2	Desiccator	SANPLATEC SK0007	1997. 7	211	Ms. Varatip
80	1996	FTX-52-3	Desiccator	SANPLATEC SK0007	1997. 7	211	Mr. Sumate

No.	F. Year	JICA.No.	Name	Model	Install. Yr.	Rm.No.	Inspector
81	1996	FTX-52-4	Desiccator	SANPLATEC SK0007	1997. 7	314	Ms. Attaya
82	1997	FTV-18	Refrigerated Showcase	EYELA RC-M 100C	1998. 6	312	Ms. Supaporn
83	1997	FTV-19	Rheo Meter	Daiichi Kagaku RT2020, TR801	1998. 6	102	Ms. Pantip
84	1997	FTV-20	Hydraulic Press Machine	KAWANISHI TK-5	1998. 6	113	Ms. Orawan
85	1997	FTV-21	LCD Projector with Computer	SHARP / COMPAQ	1998. 6	301	Ms. Somprasong
86	1997	FTX-53	Copy machine	CANON COPIER NP3020	1997.10	205	JICA
87	1997	FTX-54	Lazer Printer	HP Lazer Jet 6MP	1997.11	205	JICA
88	1997	FTX-55	Bench Top Autoclave	ALP Model KY-23	1998. 6	312	Ms. Supaporn
89	1997	FTX-56-1	Refrigerated Showcase	EYELA RC-M 152MC	1998. 6	111	Ms. Porathip
90	1997	FTX-56-2	Refrigerated Showcase	EYELA RC-M 152MC	1998. 6	211	Ms. Supaporn
91	1997	FTX-56-3	Refrigerated Showcase	EYELA RC-M 152MC	1998. 6	211	Ms. Pantip
92	1997	FTX-56-4	Refrigerated Showcase	EYELA RC-M 152MC	1998. 6	315	Mr. Bordin
93	1997	FTX-57-1	Safety Cabinet	EYELA RCB-30	1998. 6	111	Ms. Porathip
94	1997	FTX-57-2	Safety Cabinet	EYELA RCB-30	1998. 6	211	Ms. Supaporn
95	1997	FTX-57-3	Safety Cabinet	EYELA RCB-30	1998. 6	211	Ms. Pantip
96	1997	FTX-57-4	Safety Cabinet	EYELA RCB-30	1998. 6	211	Mr. Bordin
97	1997	FTX-58	Rotary Evaporator with Cooling Unit	EYELA Model N-1NW-29	1998. 6	111	Ms. Porathip
98	1997	FTX-59	Capillary Column	DB-23	1998. 6	209	Ms. Sunee
99	1997	FTX-60	Rotary Tube for Centrifuge	TOMY Angle Rotor TA-13	1998. 6	209	Ms. Sunee
100	1997	FTX-61	Shaker, Vertical	IWAKI, Model V-DX	1998. 6	211	Ms. Pantip

No.	F. Year	JICA.No.	Name	Model	Install. Yr.	Rm.No.	Inspector
101	1997	FTX-62	Electric Analytical Balance	Sartorius BP211D	1998. 6	315	Mr. Bordin
102	1997	FTX-63	Magnetic Stirrer	EYELA MCS-401	1998. 6	208	Ms. Pantip
103	1997	FTX-64	Homogenizer	YSTRAL X10/25	1998. 6	314	Mr. Bordin
104	1997	FTX-65-1	Water Bath	EYELA NTT-1300	1998. 6	111	Ms. Porathip
105	1997	FTX-65-2	Water Bath	EYELA NTT-1300	1998. 6	111	Ms. Porathip
106	1997	FTX-65-3	Water Bath	EYELA NTT-1300	1998. 6	111	Ms. Porathip
107	1997	FTX-65-4	Water Bath	EYELA NTT-1300	1998. 6	111	Ms. Porathip
108	1997	FTX-66	Water Bath	Techne 18/TU-20D	1998. 6	315	Mr. Bordin
109	1997	FTX-67	Water Bath	Techne 48/TU-20D	1998. 6	315	Mr. Bordin
110	1997	FTX-68	Water Distillation Apparatus	EYELA SA-5000E	1998. 6	210	Ms. Pantip
111	1997	FTX-69	Spectrophotometer	JASCO 530UV/VIS	1998. 6	316	Mr. Bordin
112	1997	FTX-70	Ultrasonic Processor	EYELA VC501	1998. 6	315	Mr. Bordin
113	1997	FTX-71	Vacuum Pump	KNF AT18IP20	1998. 6	314	Mr. Bordin
114	1997	FTX-72-1	Low Temp. Circulator	EYELA CA1110	1998. 6	111	Ms. Porathip
115	1997	FTX-72-2	Low Temp. Circulator	EYELA CA1110	1998. 6	211	Ms. Pantip
116	1997	FTX-73	Microwave Oven	NN-8955	1998. 6	315	Mr. Bordin
117	1997	FTX-74	Video Camera	CANON Video UC-100	1998. 6	304	Ms. Preeda
118	1997	FTX-75	Video Player	SR-SD220AM	1998. 6	304	Ms. Preeda
119	1998	FTV-21	Gas Chromatography	SHIMADZU GC-17A	1998.10	209	Ms. Sunee
120							

No.	F. Year	JICA.No.	Name	Model	Install.Yr.	Rm.No.	Inspector
1	1994	FQV-01	HPLC	WATERS UV-FL	1995. 7	2F, HPLC	Ms. Supapun
2	1994	FQV-02	Refrigerated Truck	TOYOTA Mighty Type x extra CAB	1995. 7	FIQD	Ms. Wanwipa
3	1994	FQX-01	Automated Mercury Analyzer	LEEMAN LAB PS200	1995. 8	2F, Hg	Ms. Supapun
4	1995	FQV-03	Vitex	Biomerieux Vitex JuniorP0001	1996. 6	1F	Ms. Kanokphan
5	1995	FQV-04	Colony counter	Spiral Biotec CASBA(TM)2	1996. 6	Micro. Lab	Ms. Kanokphan
6	1995	FQV-05	Photodiode Array Detector	WATERS PN 57002	1996. 7	2F, HPLC	Ms. Supapun
7	1995	FQX-02	Pinhole tester	Densoku seiko	1996. 8	4F	Ms. Krissana
8	1995	FQX-03	Thermocouple	Ecklund-harrison	1996. 5	S. Sakorn	Ms. Suwimon
9	1995	FQX-04	Laptop computer	TOSHIBA T2110 CS/350	1996. 7	4F	Ms. Wanwipa
10	1995	FQX-05	Analytical balance	Sartorius	1996. 6	1F	Ms. Kanokphan
11	1995	FQX-06	pH meter	Schott Gerate CG840	1996. 7	2F	Ms. Supapun
12	1995	FQX-07	Salinity Tester	Sinar handy type NS-3P	1996. 8	2F	Ms. Wanwipa
13	1995	FQX-08	Portable Thermometer	Nihon Keiryoki NKD-H-44	1996. 8	2F	Ms. Wanwipa
14	1995	FQX-09	Spiral Plate Count	Spiral Biotec Autoplate TM4000	1996. 6	Micro. Lab	Ms. Kanokphan
15	1995	FQX-10	Water Circulation Bath	EYELA CA-1100	1996. 6	1F	Ms. Kanokphan
16	1995	FQX-11-1	Desktop Computer	MTEC 486 DX4-100	1996. 3	1F	Ms. Krissana
17	1995	FQX-11-2	Desktop Computer	MTEC 486 DX4-100	1996. 3	4F	Ms. Wanwipa
18	1995	FQX-12	Laser Printer	HP JET 5P	1996. 3	4F	Ms. Wanwipa
19	1996	FQV-06	Bactrac Analyzer for 40 tubes	BACTRAC Model 4000S	1997. 7	1F	Ms. Kanokphan
20	1996	FQV-07	Automated Mercury System	LEEMAN AP 200II	1997. 7	2F, Hg	Ms. Supapun

5th JOINT COMMITTEE MEETING
THE RESEARCH PROJECT
ON THE QUALITY DEVELOPMENT OF FISHERY PRODUCTS

Bangkok, October 14, 1998
at
Chulaporn Building, 2nd Floor
Department of Fisheries

AGENDA

Welcome Address	Moderator, Chief of Biotech. Unit, FTDI Dr. Attaya Kungsuwan
Opening Remark	Deputy Director-General, DOF Dr. Sidhi Boonyaratpalin
Keynote Address	Resident Representative, JICA Mr. Kenji Iwaguchi
Report by JICA Evaluation Team	Team Leader Mr. Akira Niwa
Closing Remark	Senior Fisheries Development Specialist Mr. Sompong Hiranwat
Signing on Minutes of Meeting	
Lunch (12:00 ~ 13:00)	at Dynasty Chinese Restaurant, Central Plaza Hotel