

Directorate General of Small and Medium
Industries, Ministry of Industry

Summary Report

Republic of Indonesia

Pilot Survey for Disseminating Small and
Medium Enterprises Technologies for
Retort Food Manufacturing

April, 2016

Japan International Cooperation Agency

Samson Co., Ltd

1. BACKGROUND

Japanese retort technologies are so advanced and improved that they can be applied to almost all food, and allow them to be kept longer at normal temperature. Retort food technologies can contribute to local economy invigoration by expanding potentials of processing food using agro-products in particular areas.

Indonesia recently experiences remarkable economic growth. However, there are still large economic gaps between urban and rural areas. Consumption patterns have changed greatly as the number of middle income groups have increased and their lifestyle have modernized in the urban area, while rural areas still face many development challenges such as insufficient infrastructure, resulting in difficulties in storage and distribution of food.

Furthermore, Indonesia continues to see strong dependency towards primary products for industrial and exported products. It is faced with the issues of breaking through dependency towards primary products that include resources with low processing levels. Also, in order to stabilize its macro-economy, measures such as diversifying export products, adding value, and encouraging exports of industrial products are required.

In line with these current situations, Samson Co., Ltd, a top retort food production machine manufacturer in Japan, found Indonesia as a potential market, because Indonesian retort food processing industry has not yet matured and retort food processing technology has a potential to contribute to improve food supply in rural areas as well as to activate local economy by encouraging agro-processing and distribution businesses in rural areas.

2. OUTLINE OF THE PILOT SURVEY (hereinafter referred to as the "Survey")FOR DISSEMINATING SME'S TECHNOLOGIES

(1) Purpose

- To see how retort foods can be adopted in Indonesia,
- To disseminate merits of retort food processing technologies in Indonesia
- Technical transfer for sustainable utilization of retort food processing technology in Indonesia

(2) Activities

The following four results were anticipated from the Survey:

- Development of food appropriate for retort processing
- Transfer of food manufacturing know-how to counterpart organizations
- Build the foundation for dissemination of retort food and its manufacturing, together with regional promotions
- Confirmation of business prospects for retort food manufacturing

Activities (1) through (4) below were conducted as specific actions for the Survey.

Activity (1): Review of foods to be retort-processed and establishment of Survey implementation structure

- a) Select around 50 items as prospective foods to be retort-processed
- b) Create retort food test products at the seller's prototype facility in Japan
- c) Installation of retort food manufacturing machine in Indonesia
- d) Selection of operators for food processing equipment

Activity (2): Manufacturing of retort food and confirmation of demands for retort food

- a) Manufacturing of retort food
- b) Hosting of sampling session in workshop style

Activity (3): Publicity and promotions

- e) Test sales through existing retail channels
- f) Participation in trade shows pertaining to food and SME technology

Activity (4): Analysis of demonstration results and preparation of full-scale business development plans after the Survey

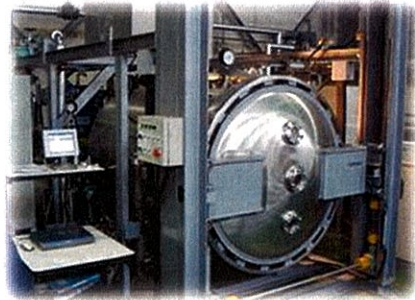
- a) Analysis and assessment of retort food and processing machines based on data acquired from demonstrations
- b) Preparation of full-scale business development plans after the Survey

(3) Information of Product/ Technology to be Provided

Retort food manufacturing machines consist of two devices which are retort machine and cooking processing device. The retort machine is a device to enable to cook and to sterilize at the same time, while the cooking processing device consists of two jackets steam cookers, vacuum pressure inclined shaft kneader, inclined shaft kneader and vacuum cooler. These devices are applicable to most of existing food in Indonesia. The processed retort food can be preserved at normal temperature with anti- food poisoning treatment. It contributes to an efficient use of food resource.

- Retort machine: this device can cook and sterilize a lot of food at the same time. It can minimize cooking time and save energy. The device can record max. 50 different operational conditions of products at once with easy one touch operation.
- Cooking processing device: it consists of two jackets steam cookers, vacuum pressure inclined shaft kneader, inclined shaft kneader and vacuum cooler. The device can deal

with various cooking process of "kneading", "steaming", "boiling", "mixing", and "cooling-down", and can cook a wide range of retort food.



Cooking and sterilization device of Samson Co., Ltd. It can cook and sterilize food stored inside packages.



Samples of retort food produced with the retort processing machine of Samson Co., Ltd.

(4) Counterpart Organization

Directorate General of Small and Medium Industries, Ministry of Industry

Indonesia's Directorate General of Small and Medium Industries, Ministry of Industry is a central government organization that proposes and implements policies on the promotion of SMEs. The Directorate General of Small and Medium Industries, Ministry of Industry possesses regional branches, which can serve as regional bases for retort food processing technology if expanded to those regions.

Unit of Handicraft Industry, Department of Industry and Energy, the Local Government of DKI Jakarta Province

DKI Jakarta is the local government that has jurisdiction over Jakarta, the capital city of Indonesia. The Unit of Handicraft Industry, Department of Industry and Energy that was established in 1971 is the unit that conducts promotion of local industries within DKI, and is scheduled to be responsible for the promotion of food processing as well.

(5) Target Area and Beneficiaries

The Survey was conducted in Jakarta while publicity and promotion activities were conducted in Jakarta and Surabaya. Direct beneficiaries of the Survey were those who engage in food industries.

(6) Duration

From February 2014 until September 2016, and lasted approximately two and a half years. Activities in Indonesia finished in March 2016.

(7) Progress Schedule

Progress schedule of the Survey is as shown in the figure below.

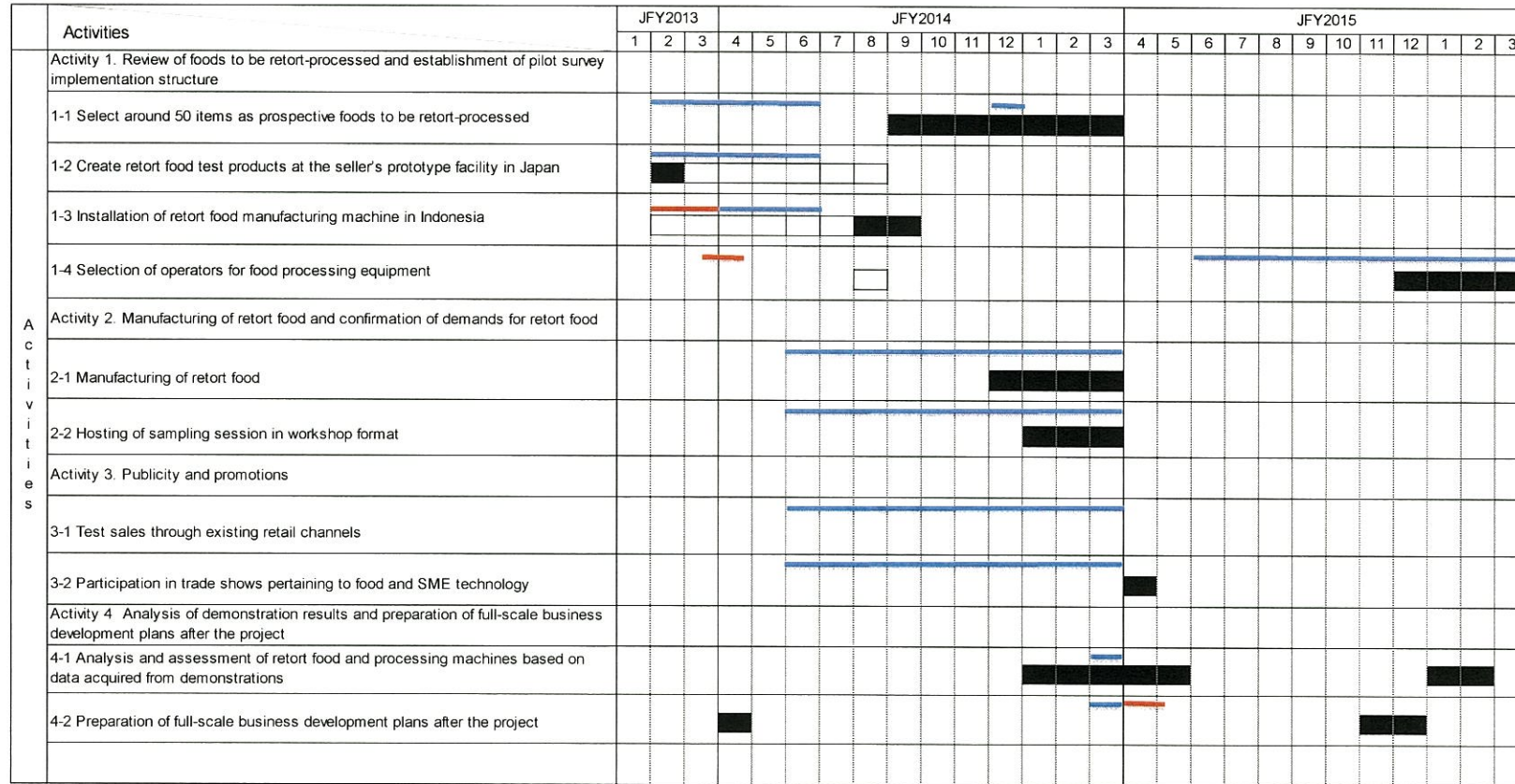


Figure 1: Progress Schedule

(8) Manning Schedule

Manning schedule of the Survey is as shown below.

Position	Name	Company		JFY 2013												JFY 2014												JFY 2015												M/M	
				9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	Indonesia	Japan					
Team Leader	Tadashi Komazetsu	Samson	Plan	[Gantt chart showing manning for Plan]																																				2.67	0.50
			Result	[Gantt chart showing manning for Result]																																				2.97	0.50
Retort Food Processing Machine (Installation)	Tomotaka Isono	Samson	Plan	[Gantt chart showing manning for Plan]																																				1.00	0.50
			Result	[Gantt chart showing manning for Result]																																				1.63	0.50
Retort Food Processing Machine (Maintenance)	Tetsuhisa Yamamoto	Samson	Plan	[Gantt chart showing manning for Plan]																																				2.00	0.50
			Result	[Gantt chart showing manning for Result]																																				0.57	0.50
Retort Food Processing Machine (Operation)	Hiroshi Muri	Samson	Plan	[Gantt chart showing manning for Plan]																																				2.00	0.00
			Result	[Gantt chart showing manning for Result]																																				2.77	0.00
Chief Advisor	Atsushi Saito	IDCJ	Plan	[Gantt chart showing manning for Plan]																																				1.80	0.00
			Result	[Gantt chart showing manning for Result]																																				1.70	0.25
Business Strategy	Maschiro Ito	Nomura Trading	Plan	[Gantt chart showing manning for Plan]																																				2.33	0.00
			Result	[Gantt chart showing manning for Result]																																				2.97	0.00
Project Monitoring and Evaluation	Yuji Sukekubara	IDCJ	Plan	[Gantt chart showing manning for Plan]																																				2.00	0.00
			Result	[Gantt chart showing manning for Result]																																				0.00	0.00
Project Monitoring and Evaluation 2	Yuriko Yoneda	IDCJ	Plan	[Gantt chart showing manning for Plan]																																				0.00	0.00
			Result	[Gantt chart showing manning for Result]																																				1.17	0.30
			Plan	[Gantt chart showing manning for Plan]																																				13.80	1.50
			Result	[Gantt chart showing manning for Result]																																				13.78	2.05

Indonesia
 Japan

Figure 2: Manning Schedule

(9) Implementation System

The Survey designates Samson Co., Ltd (“Samson”) as the contractor, with Nomura Trading Co., Ltd (“Nomura Trading”) and International Development Center of Japan (“IDCJ”) participating as external resources, with the Directorate General of Small and Medium Industries, Ministry of Industry and the local government of Jakarta as counterpart organizations.

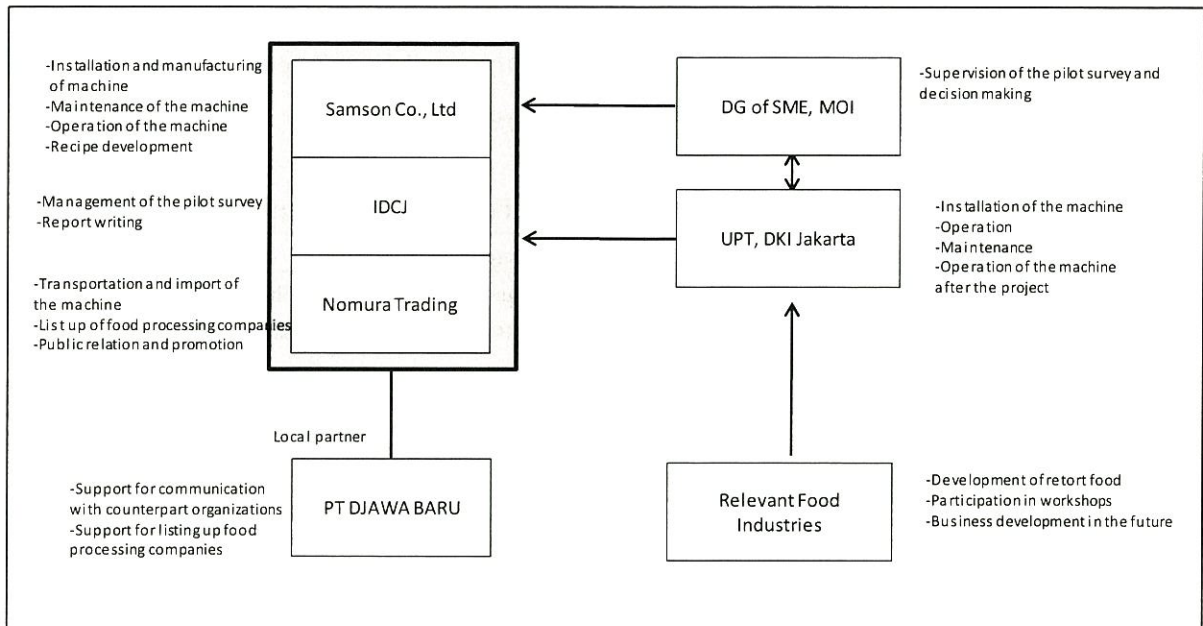


Figure 3: Survey Implementation Structure

3. ACHIEVEMENT OF THE SURVEY

(1) Outputs and Outcomes of the Survey

The activities carried out through the Survey are described below by item:

Activity (1) Review of foods to be retort-processed and establishment of Survey implementation structure

a) Select around 50 items as prospective foods to be retort-processed

Indonesia’s food processing market analysis was conducted by collecting existing data and references conducting on-site surveys as the first step to determine foods that can potentially be processed into retort food. Reviews on retort food prototype items were also conducted.

Existing processed food in Indonesia

The usage of processed foods is increasing in Indonesia in proportion to the country’s economic growth, particularly following the increase of middle to upper income households living in urban areas. Excluding beverages, its breakdown comprises frozen foods, dried noodles, together with canned and bottled fish and vegetables. Cans and bottles are popular for processed foods ideal for long-term storage, with some incorporating aluminum-processed pouches (flavor seasoning). These canned and bottled products for storage in addition to flavor seasonings using

pouches are already accepted among consumers, and can potentially be developed into retort food.

• **Existing retort food in Indonesia**

There are already four to five companies that manufacture retort food, and most of them produce desserts and pasta sauces for restaurants. One company started manufacturing Indonesian curry for Hajj (Islamic pilgrimage to Mecca). Furthermore, the Indonesian army has apparently adopted retort food. Although retort food in Indonesia may be limited in variety, launches targeting characteristic segments have just started.

Table 1: Examples of Retort Food Produced in Indonesia

Company	Retort Food	Target Segment	Others
Company A (Medium-sized food processing company)	Dessert (Red Bean Porridge)	Indonesian and Chinese restaurants	The company thinks about targeting consumers depending on volume of sales.
Company B (Large-sized food processing company)	Pasta Sauce	Medium to high income households living in cities	The company sells pasta sauce to encourage pasta sales.
Company C (Large-sized food processing company)	Indonesian curry	Hajj (pilgrimage to Mecca)	The company developed the products as preservable food during pilgrimage to Mecca. It sells for one dollar per package.

Source: Interview by the JICA Survey Team

• **Distinguishing local agricultural and fishery products**

The Widodo administration inaugurated in October 2014 features developments focused on “maritime” for its policies. As one measure to go in line with such policy, the administration plans to leverage agricultural and fishery products processing to top added value to regional produce, and regional specialties grown around Indonesia are thus speculated to be high in utility value. Marketing regional specialties to large cities such as Jakarta, Surabaya and abroad upon developing them into retort food and leveraging their preservative nature may further increase the value added to the specialties.

• **Price of existing food**

The processed food market is expanding in Indonesia in that the launch of retort food can be readily accepted. Prospective demands for retort food are anticipated as demands for processed food and the food service industry is expected to increase together with income particularly in urban areas.

Amid such conditions, pricing is a significant key to increase demand. In particular, when targeting the middle class that is expected to increase, casual shops called *warung*, mobile food stands called *kaki lima* and fast food restaurants in cities, together with frozen foods, cans and

bottled food sold in supermarkets are likely to rival retort food.

Since the cost of pouches used in retort products are about 3,000 Rp per pack and amortization, maintenance and electric/water usage costs are about 100 Rp per pack according to estimates by the Survey team, retort food to date appears to be not even close to meals sold in food stands in the city at least in terms of pricing when considering the ingredient and preparation costs, retort pouch costs and amortization and maintenance costs. Furthermore, products such as flavor seasoning are predicted to not easily offset costs for retort pouches and amortization when considering that their retail prices are cheaper than retort costs.

• **Potential food to be processed as retort food**

Retort food are therefore limited in competitiveness at present compared to existing restaurants and food stands when manufactured using traditional Indonesian cuisines and seasoning. When considering such aspect, the following three areas are anticipated to be potential targets for retort food in the short term:

- Non-Indonesian food targeting the middle and high income households in urban areas
- Food ingredients for restaurants, convenience stores, delivery restaurants and prepared food shops
- Halal food and ingredients for exporting

b) Create retort food test products at the seller's prototype facility in Japan

Recipes for retort food using food and ingredients selected were developed and tested. Although there were some challenges, including the formulation of *sambal* and other spices that differ from those used in Japanese cuisines, and procurement of gelatin not derived from pork, recipes were successfully adjusted to become acceptable in flavor in applying retort technology fostered in Japan to Indonesian cuisine as well.

c) Establishment of Survey implementation structure and installation of retort food manufacturing machine in Indonesia

The Survey team requested cooperation from the Directorate General of Small and Medium Industries, Ministry of Industry and Unit of Handicraft Industry, Department of Industry and Energy, the Local Government of DKI Jakarta Province (“UPT”) as the implementing organizations for the on-site survey conducted in February 2014. The team presented the Survey plan and requested the establishment of Survey implementation structure in which it was approved. In addition, the parties agreed on installing the retort food processing equipment within UPT, and completed installation of the equipment by the end of September.

d) Selection of operators for food processing equipment

Two employees from UPT were chosen as operators, and went through about one week of operation training in Japan at the end of August 2014. During the training, participants learned

through lectures on retort food equipment and manufacturing practices of prototypes. In addition, as a result of personnel changes in the counterpart organization that took place in January 2015, operator training was held for the two employees from January to February 2016 in Indonesia.

Activity (2) Manufacturing of retort food and confirmation of demands for retort food

a) Manufacturing of retort food

- **Procurement of materials in Indonesia**

The Survey team studied whether or not pouches used for packaging retort food were available for procurement in Indonesia and confirmed that two Japanese printing companies can supply pouches that can be used for retort food processing.

- **Manufacturing of retort food in Indonesia**

Retort food manufacturing started on-site from December 2014. The manufacturing was conducted mainly to conduct demonstrations, deal with prototype requests from private companies and estimate costs for retort food processing.

- **Calculation of cost for retort food manufacturing**

Because information on costs such as equipment cost and amortization expenses are requisites in order to pitch retort food processing equipment to Indonesian food processing companies and relevant organizations in the future, the estimate costs for retort food processing were calculated based on actual figures from retort food processing in Japan upon taking into account prototype data acquired in Indonesia. The estimate cost for retort food processing in Indonesia was about 3,300 Rp per pack. The ratio of equipment amortization expenses was low within the costs required for retort food manufacturing, and it was evident that the cost for pouches accounted for most of the total cost.

Table 2: Approximate Cost for Retort Food Manufacturing in Indonesia

(Unit: Indonesian Rupiah)

Item	Samson's cost	Chinese cost	Others
Running cost	150	250	Utilities
Depreciation cost of the machine	130 *Machine cost is 2,500,000,000 Rp	50 *Machine cost is 800,000,000 Rp	Depreciation period is 7 years and production volume is 10,000 sets per day.
Pouch cost	3,000	3,000	For 300 gr

Source: Survey Team

• **Specification comparison with Chinese retort food manufacturing machine**

Retort machines are already being imported in Indonesia, with manufacturing and sales of retort food already taking place. Interview surveys conducted by the Survey team revealed that there were about five companies that manufacture retort food, and all five of them used retort food processing equipment made in China. The Chinese-made retort equipment is the heated water storage type for sterilizing, which is not equipped with the latest methods such as the heated jet water type (Samson method), heated water spray type and heated water injection type that are currently mainstream in Japan.

Although the heated water storage type is superior in terms of price when compared with the heated jet water type, the latter is significantly ahead in performance, since it is compatible with many ingredients and requires little water. Japan has shifted from the heated water storage type to heated jet water type in its history of retort manufacturing equipment development. Rather than being a competitor, heated water storage types can be thought of as substitute products that possess different sterilizing performance.

b) Hosting of sampling session in workshop style

Private food processing companies were invited to a workshop held at UPT’s equipment installation location. Table below shows an example of the workshop.

Table 3: Overview of a workshop

Date	January 21, 2015
Location	DKI Jakarta Unit of Handicraft Laboratory
Names of companies that participated	Hasan Sriwijaya Pempek, Anna Cookies, Bandeng Presto, Tasayu Nasi Uduk, Aneka Kue Basah, Aneka Kue, Diamond fish, Kue Pie, Lavidia, Rumah Kreatif Bina Mandiri, Waroeng-Qu, Cahaya Kerupuk
Participants	12
Workshop schedule (agenda)	13:30 Start 13:30-13:45 Introduction of companies and the Survey 13:45-14:15 Introduction of the retort food processing equipment 14:30-15:30 Demonstration (<i>Bubur, nasi goreng, soto ayam</i>) 15:30-16:00 Sampling of prototypes, Q&A
Comments from workshop participants	<ul style="list-style-type: none"> • It’s probably not suited for household industries. • I don’t think the equipment is good for small companies in terms of space and cost. • I would expect equipment with lower pricing. • It would be great if about one small company per city can own this equipment, but would there be support from the government? • Companies can’t afford to purchase the equipment. • The flavors don’t change and are good even after processing. • It would be better if I could see the processes before ingredients are placed into the retort kettle. • I want to see all the cooking processes (or know about the times required for processing).

Activity (3) Public Relation and Promotion

a) Test sales through existing retail channels

Several test manufacturing were conducted for retort food in Indonesia. The prototypes were based on assumptions for clients and purchasers already made by the supplying companies, and are products that have started review for commercialization by having clients and purchasers sample them.

The initial plan was to conduct test sales of the prototypes to check consumer responses. It was determined through the Survey, however, that the significance of observing responses towards retort food through test sales was not as high as initially expected since there were already processed food products that use aluminum-coated plastic pouches with the same shape in the Indonesian market.

Moreover, the selling of prototypes was given up upon discussion with JICA because approval from the National Agency for Drug and Food Control (“NADFC”) together with registration as a food marketing company in Indonesia will be required if retort food was to be manufactured and sold in the country, which was deemed to be difficult to accomplish within the Survey period.

b) Participation in trade shows pertaining to food and SME technology

The Survey team exhibited at FOOD & HOTEL INDONESIA 2015 held from April 15 to 18, 2015, and 92 persons visited the booth. Each visitor asked questions on the potential of developing retort food from their company’s products together with technical questions, and was thus meaningful in that visitors further recognized “retort” food and technology.

Survey team members interviewed exhibit visitors after hearing explanations and observing the booth on their opinions in seeing the exhibitions of retort food and equipment.

c) Others

- **Collaboration with university**

The Southeast Asian Food and Agricultural Science and Technology Center, or SEAFAST, operates in the Department of Agriculture at Bogor Agricultural University. SEAFAST hosts food processing workshops for food processing companies from all over Indonesia twice a year (held in May and September for 2014).

The Survey team proposed a lecture introducing retort food processing technology in the workshop held by Bogor Agricultural University’s SEAFAST as a means to disseminate retort processing technology to local regions.

- **Promotion toward other ministries**

Disseminating retort food processing as a technology for agricultural and/or fishery product processing through central government agencies that have branches in local regions is one way to

expand retort food equipment to the regions. Following this, the Survey team visited the following four government agencies and research institutions to introduce retort food processing technology and hold discussions on joint promotions to be held:

- Agricultural Product Processing and Marketing Department, Ministry of Agriculture
- Cooperatives, Cooperative for the Ministry of Small and Medium Industry, Industrial Energy Department
- Fishery Product Processing and Marketing Department, Ministry of Marine Affairs and Fisheries
- Indonesian Center for Agricultural Postharvest Research and Development

Activity (4) Analysis of demonstration results and preparation of full-scale business development plans after the survey

a) Analysis and assessment of retort food and processing machines based on data acquired from demonstrations

• Production of retort food in Indonesia

The trials proved that Indonesian food can be processed into retort food through recipe development and sampling of Indonesian dishes. Additionally, it was proven that the manufacturing of retort food was feasible using Indonesian ingredients, seasoning and pouches procured from Japanese companies in Indonesia through the retort equipment set up in UPT.

Other findings

Furthermore, the following insights effective in preparing business plans were achieved through interacting with companies during the demonstration process:

- I want to learn more about retort food's shelf life and changes in flavor over time, as well as what kind of food can be made into retort products. In terms of equipment, I also want to know about the manuals pertaining to operation methods, the operation process, costs, maintenance, etc.
- I'll consult Samson for advice and information on maintenance methods, prototype development, combination methods of food and recent trends in the food industry if I purchase the equipment.
- I want a more affordable version of the retort equipment for Indonesian companies because the equipment made in Japan is too expensive.
- There is information that retort equipment made in China imitates German-made machinery and breaks down in about half a year, while the German editions are extremely high-quality but also are expensive (3-4 times the price of equipment made in Japan).

b) Preparation of full-scale business development plans after the Survey

A business development plan after the Survey was prepared while using insights and findings acquired through the demonstration activities above as reference.

(2) Self-reliant and Continual Activities to be Conducted by Counterpart Organization

The set of retort food machinery installed at UPT requires counterpart organizations to be capable of independent management and operations. The Survey team thus discussed the re-selection of operators and securing of budgets with the Directorate General of Small and Medium Industries, Ministry of Industry and the Department of Industry and Energy, the Local Government of DKI Jakarta Province in May 2015. As a result, the ownership and operation of retort machinery after the survey were decided as the following:

- The set of retort machinery installed at UPT will be transferred to the Directorate General of Small and Medium Industries, Ministry of Industry by JICA after the Survey. Procedures will then be taken to transfer the set to the Department of Industry and Energy, the Local Government of DKI Jakarta Province from the Directorate General of Small and Medium Industries, Ministry of Industry.
- The management and operation of the retort machines will be conducted by the Unit of Handicraft Industry, Department of Industry and Energy, the Local Government of DKI Jakarta Province.
- As the budget for 2016, MOI secured about 60 million Rp for spreading and disseminating retort food and processing technologies. This budget is equivalent to holding workshops twice a year.
- The budgets for 2017 and onward will be secured by the Department of Industry and Energy, the Local Government of DKI Jakarta Province.

The Department of Industry and Energy, the Local Government of DKI Jakarta Province prepared an operational plan for the retort machinery transferred as a work plan. The work plan plans to have MOI and DKI Jakarta Province select 150 small and medium food and beverage companies near Jakarta to use the machinery installed in UPT from January to December 2017 for them to experience retort food and technologies.

4. FUTURE PROSPECTS

(1) Impact and Effect on the Concerned Development Issues through Business

Development of the Product/ Technology in the Surveyed Country

Indonesia's issues in development from the socioeconomic perspective are to grow out of its economy dependent on primary products and energy resources such as petroleum and gas, together with the correction of economic disparities between urban and rural areas. The country is

also in need of fostering domestic industries following its participation in AEC and other multilateral economic partnership agreements. To respond to the development issues pertaining to socioeconomic development, the Widodo administration plans to place focus on agricultural and fishery processing which aims to enhance value added to regional agricultural and fishery products, improve income of agricultural and fishery workers and increase employment opportunities in the non-agricultural sector by promoting the processing industry.

Through introducing retort food and its processing technologies to food processing companies and conducting development support for prototypes, the Survey provided opportunities for respective companies to develop new businesses so that the agricultural and fishery industries can expand their possibilities for new product usage and high values added.

Furthermore, if the awareness level of retort food increases in major cities, local regions may be able to develop agricultural processing businesses in the medium to long-term. For example, retort products using niche regional specialties can be developed. Higher values can be added in the long run if regional cooperatives and farmer groups can conduct retort food processing.

(2) Lessons Learned and Recommendation through the Survey

Ministry of Industry and DKI Jakarta gave the Survey team generous support in exporting retort machine to Indonesia. Thanks to the cooperation, JICA Survey team could export the machine free of tax. Following two are lessons learned throughout the survey.

Installation and demonstration of machine are effective tools for sales activities

Over 20 Indonesian food processing companies manufactured prototypes using the retort machine installed in UPT during the survey period. The companies have pointed out benefits, including deepened understanding for retort machines and products by actually using the equipment, and the convenience of being able to create prototypes without having to travel internationally. It was made clear that the incorporation of actual machines upon leveraging the Survey scheme became an effective and important tool in terms of promoting Indonesian company's understanding of the technology as well as developing business plans and carrying out sales activities for the Japanese company.

Collaboration with private sectors might be necessary to promote agricultural food processing in rural areas

Farmer groups in Indonesia are small in scale and thus face difficulty in creating expenses necessary for investment. Although some agricultural groups manufacture agricultural processed products, many have issues such as having low added value of lacking retail routes for processed agricultural products because they can only afford rudimentary processing. It is thus unlikely that the groups can resolve the issues by themselves in short periods of time. Productions of crops that meet the needs of private sectors are becoming feasible recently, however, following the

penetration of contract farming led by private firms. Collaborations with private companies involved in both the market and distribution, therefore, may lead to the shortest path to generate added value to agricultural products of regional farmer groups.

ATTACHMENT: OUTLINE OF THE SURVEY

