1）第1回セミナー分

COLORIMETRY

1. Colorimetry is a sensitive and convenient method of analysis of inorganic and organic compounds. It is a simplified method of spectrophotometry for visible light. The difference of colorimetry and spectrophotometry is mainly the selection of the monochrometer.

When the transparent solvent is illuminated by light, light is not absorbed. So that the intensity of the incident light and the transmitted light are the same. But if a colored substance is disolved in the solvent, a part of light is absorbed. The energy of photos stroking the molecules (or ions) of colored substance is absorbed and to heat or chemical energy. So that the intensity of the light decreases. The transmitted light becomes darker than the incident light. If the incident light is monochromatic light, we recognize it as such. But if the incident light is white light, we recognize it, by naked eyes, as coloring. Because the rate of absorption is different according to the wave length. The transmitted light loose the balance of white light and color develops.

A solution which absorb shorter wave (blue) seems to be yellow. A solution which absorb green light seems red.

We can measure the concentration of a colored solution by comparing the intensity decrease of transmitted light with the incident light. More practically the incident light is replaced to the transmitted light of pure (non-color) solvent.

In the case of spectrophotometry, the incident light is the monochromatic light, dispersed by the prism or the refraction grating and selected by the slit. In the case of the colorimetry the incidnet light is white light or the rough monochromatic light made by the filter; gelatin filter or interference filter. The equipment for colorimeter is simple and cheap than spectrophotometer, but is enough for qualitative analysis.

（以下省略）

2）第２回セミナー分

SPECTROPHOTOMETRY

1. Various kinds of spectrophotometry

Avsorption Spectrophotometry

Spectrophotometry means various methods, including the optical system and the photoelectric system, which disperse the light into spectrum and measure the intensity of the spectrum. The light to be applied includs ultraviolet, visible and infra-red light. The most common technics among various sp. ph. met. is absorption sp. ph. met. of liquid and solution.

The designs of the instruments resemble each other for UV and visible light. But the construction is different with the instrument for IR light. In the present seminor we will concern mainly about absorption sp. ph. met. of UV and visible light. For IR sp. ph. met. we shall wait another chance.

Absorption sp. ph. met. of UV and visible light is available for organic substances for quantitative determination. It is helpful for structural study and for identification. But for structural study and identification of the substances, Ir sp. ph. met. is more helpful.

Colorimetry is the simplified method of absorp. sp. ph. met. of visible light as mentioned in the previous seminor, although historically they develop independently each other.

IR spectrophotometry is most useful method for the identification and structural study of purified organic substance. But it is not a available for quantative determination. Another limitation is that, this method is hardy applicable for aquenous solution. It is only applicable to the power of crystal or the solution inorganic solvents.

Fluorometry

Fluorometry is another kind of sp. ph. met.. There are organic and inorganic substances which emit visible light when they are irradiated under UV lump. That is, a part of energy which has been absorbed from the light, is re-emitted as the light of lower energy; the light of longer wave length. The fluorescence can be observed both in the solution and the solid state.

Fluorescence is not common nature of substances. So that the substance having fluorescence is easily recognized. The color of the fluorescence, or exactly, the fluorescence spectrum is the specific sign of the substance. Vitamin B_1 and Vitamin B_2 are the examples. They are easily detected and determined fluorometrically.

The instrument of fluorometry is different from the absorption sp. ph. met.. Because the fluorescence must be observed from rectangular direction of the light beam, in order

to avoid the disturbance of transmitted light. So that instrument must have 2 sets of monochrometers. One is to select the irradiation light. Another is to observe the fluorescence spectrum.

Emission Spectrophotometry and Flame Photometry

These methods are available to analyse inorganic elements, especially metal elements.. These elements are excited to brightness at high temperature. The emitted light consists of line spectrum, specific to that element. So that the detection of the element is possible by the inspection of the spectrum. The spectrum includes UV as well as visible regions.

Commonly, the methods are called as emission sp. ph. met. by which the solid sample is heated and evaporated on the carbon electrode by the heat of electric arc or of electric spark. The emitted light is dispersed into spectrum, which is photographed on the film. There are instruments which is equipped with photoelectric detecter and recorder. This is possible, but these instruments is expensive and is available for limitted applocation. Because it is difficult to the hold the exciting condition condition constant for a time. Especially in the case of the spark which is momentary. The emission sp. ph. met. is most widely used in the field of metal sciences. In the field of agricultural and biological sciences, this method have only limitted applicaton.

On the other hand, flame photometry is important in the field of agricultural science as well as food chemistry. Because the determination of Na and K entirely depends upon this method. Flame ph. met. is most useful for the determination of alkali metal elements and some of the alkali earth metal elements such as Ca and Si.

Flame photometry is a kind of emission sp. ph., which excite the element in the flame of gas burner. The temperature in the flame of gas is lower than the electric arc or spark. Only limitted numbers of elements are evaporated and excited to brightness. This is convenient for the analysis of these limitted numbers of elements; alkali metals and alkali earth metals. Because the mixed spectrum is simplified and is easy to select the line. The interference filter is enough for quantitative purpose.

By the determination of Ha, for example, the sample is dissolved into water. The aquenous solution is atomized as mist into the flame of gas continuously. The mist is dried up. The salt (NaCℓ etc.) degenerates.. The vapour of Na is excited to brightness. It emitt the yellow light, named D-line (two lines of 589.0 and 589.6 mm). The fuel gas may be propane gas, coal gas, H_2 or acetylene gas. It is burned with the blow of air or oxygen. Into the flame the mist of aquanous solution is blown in. The intensity of the light is measured photoelectrically and compared with detection curve made by the measuring of standard solutions.

(以下省略)

3）第３回セミナー分

PH METER AND MEASUREMENT OF PH

(1) Definition of PH

The origin of the word of pH derived from the capital letter of power and hydrogen. At first pH was a expression of molar concentration of hydrogen ion by its reciprocal powers of ten. For example, pH value of pure water is 700 at 23°C (not the water in equilibrium with CO_2 in the air). Because water contains 1,000 x 10^{-7} mol/ℓ of H^+ ion at 23°C.

It was srensen of Sweden who has proposed this expression (1909). Because biological reaction was seriously influenced by H^+ concentration, although it accured only in very dilute solution of H^+ concentration, near neutral, solution. The expression in molarity was inconvenient. He also decided to omit the symbol "minus". So that, in strong acid, pH value will exceed O(1M) and become minus. But expression of pH never used in such region.

Srensen studied enthusiastically the pH values of buffer solutions to provide stable and known pH conditions for biological experiments. Buffer solution is a combined solution of weak acid and alkali or the solution of weak base and acid. pH of the buffer solution is decided by its ratio of acid to base and do not depend upon concentration. Dilution do not change the pH value.

The method by which Srensen measured the buffer solutions is the method called hydrogen electrode method. I'll mention later. The pH values of buffer solutions he has decided are still used. But he later (1924) noticed that the values he had decided did not correct according to his original deffinition of pH, the reciprocal powers of ten of the molarity of hydrogen ion.

$$pH = -\log [H^+]$$

So he changed the deffinition of pH as follows to adapt the electrical method of measurement;

$$pH = -\log [H^+]$$

This is the present theoretical deffinition. α is called as "activity coefficient of hydrogen ion". It is the value within $0 < \alpha < 1$. It is not constant. In neutral solution value is neglisible, but in acid solution the value is not to be neglected. For example, pH values of hydrochloric acid are as follows:

Normality of acid	pH of the solution
0.1 N	1.076 < 1,000
0.01 N	2.035 < 2,000

Although hydrogen chloride is thought to completely, dissociated in the water, the reaction to take off eelectron from the surface of the electrode is somewhat weaker than the calculation.

Later on Srensen's values has been criticised. The discussion was around the method of determination. The electric method is exact to get comparative value between two solutions. But there are many rooms to criticise todecide absolute value.

At least it was agreed to be practical, that a operational definition is to be settled. In Japan it is settled by the law of government in Japan Industrial Standard (JIS). It follows to the international agreement.

The practical deffinition of pH starts from the primary standard solution. It is 0.05M potasium hydrogen phthanale C_6H_4 (COOH) (COOK). The pH values are decided as follows:

Temp.	pH	Temp.	pH	Temp.	pH
60°C	4.10	25°C	4.01	10°C	4.00
40°C	4.03	20°C	4.00	5°C	4.01
30°C	4.01	15°C	4.00	0°C	4.01

This was originally calculated by the equation based on the experiment.

$$pH(S) = 4.00 + 1/2(\frac{t - 15^{\circ}}{100})^2 \qquad \text{(between 0 - 60°C)}$$

The value 4.00 at 20°C was originally based on the measurement. But at present, this is the authorized stand point avoiding any critism. In U.S. this value is authorized as 3.999. But in Japan only the value down to 2 places of decimals is authorized, because the most precision type pH meter is authorized down to 2 places of decimals.

The authorized practical definition of pHis as follows:

$$pH\,(X) = pH\,(S_1) + \frac{[E_x - E_1]\,pH\,(S_2) - pH\,(S_1)}{E_{s1} - E_{s2}}$$

Where:
- X; Sample solution
- S_1; Primary standard (0.05M Phthalate)
- S_2; Secondary standard
- E; Electromotive force measured by the glass electrode pH meter.

Then secondary stndard and their authorized pH values are necessary. The authorized 3 kinds of solutions. The pH value at various temperatures are authorized. The values are, of course, originally the determined values.

Compositions and authorized pH values of the primary and the secondary standard are shown in following Table.

TABLE
COMPOSITION OF THE STANDARD SOLUTION

Phthalate	pH at 20°C 4.00	0.05H_6H_4 (COOH) (COOH)
Oxalate	1.60	0.05M KH_3 $(C_2O_4)_2 \cdot 2H_2O$
Phosphate	6.90	Mixture of equal volumes of 0.025M KH_2PO_4 and 0.025H Na_2HPO_4
Borate	9.27	0.01H $Na_2B_4O_7.10H_2O$
Carbonate	10.12	Mixture of equal volumes of 0.025M $NaHCO_3$ and 0.025M Na_2CO_3

TALBLE
AUTHORIZED PH VALUES

Temp.	Phthalate	Oxalate	Phosphate	Borate	Carbomate
0°C	4.01	1.67	6.98	9.46	10.32
5°C	4.01	1.67	6.95	9.39	10.25
10°C	4.00	1.67	6.92	9.33	10.18
15°C	4.00	1.67	6.90	9.27	10.12
20°C	4.00	1.60	6.88	9.22	10.07
25°C	4.01	1.68	6.86	9.10	10.02
30°C	4.01	1.69	6.85	9.14	9.97
35°C	4.02	1.69	6.84	9.10	9.93
40°C	4.03	1.70	6.84	9.07	9.91
45°C	4.04	1.70	6.83	9.04	-
50°C	4.06	1.71	6.83	9.01	-
55°C	4.08	1.72	6.84	8.99	-
60°C	4.10	1.73	6.84	8.96	-

（以下省略）

REPORT ON

UPGRADING OF AGRICULTURAL VOCATIONAL SCHOOL TEACHERS

IN

AGRICULTURAL MACHINERIES

AND

AGRICULTURAL PRODUCTS TECHNOLOGY

PREFACE

This report is made on the execution of an upgrading program for the Agricultural Vocational school teachers in the term of 1978/1979, carried out by the Directorate General of Elementary and Secondary Education, Department of Education and Culture in cooperation with the Faculty of Agricultural Engineering and Products Technology, Bogor Agricultural University.

The upgrading course was conducted from February 10 to April 21, 1979 with two major fields namely : Agriculture Machineries and Agricultural Products Processing, with 20 and 21 participants, respectively. They came from many places or areas.

I would like to thank all of the committee members for the excellent job and to those who had been helpful in making this project successful.

I am also indebted to the Faculty of Agricultural Engineering and Products Technology for the cooperation and understanding.

I hope this upgrading course will be useful for the development and progress of the Agricultural Vocational Schools.

Bogor, June 1979

Dean,

Ir. Soesarsono Wijandi, M.Sc.

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I. INTRODUCTION

The upgrading program for the Agricultural Vocational School Teachers had been conducted in cooperation between Faculty of Agricultural Engineering and Products Technology, Bogor Agricultural University and Directorate General of Elementary and Secondary Education, Department of Education and Culture.

The course was carried out from February 10 to April 21, 1979. There was two major fields of the course namely : Agriculture Machinaries (AM) coordinated by the Department of Agricultural Engineering and Agricultural Products Processing (APP), coordinated by the Department of Agricultural Products Technology.

The subjects offered to the AM group were Soil & Water Engineering, Agricultural Products Processing Machinaries, and Teaching Methods and Evaluation. Study tours, seminars and discussions on problem solving has also been conducted.

The subjects offered to the APP group were The Utilization of Agricultural By-products and Sensory Evaluation and Quality Control. The Laboratory Practicum and Study tours to research institutions had also been conducted to strengthen the learning process.

II. COMMITTEE AND TEACHING STAFF

The working committee consisted of a Central Committee and two Sub-committees carried out by the respective Departments offering the major subject matters.

1. Central Committee (Faculty Level)

Supervisor	Ir. Soesarsono Wijandi, M.Sc.
Chairman of the Working Committee	Ir. Soemijati
Secretary	Ir. P.A. Rangkuti
Treasurer	Ir. Darwin Kadarisman
Coordinator for the AM group	Prof. Siswadhi Soepardjo
Coordinator for the APP group	Ir. Hidayat Syarief, MS
Acomodation, Logistic and Documentation	Drh. R. Muljono Judoamidjojo

2. Sub-committee of the AM group

Coordinator	: Prof. Siswadhi Soepardjo
Secretary	: Ir. Bambang Pramudya
Treasurer	: Ir. Aceng Muchlis
Trips/Visits/Seminar	: Ir. Tuti Priyanto

Subjects :

- Soil and Water Engineering and Irigation Pumps	: Ir. Achmadi Partowijoto
- Agricultural Products Processing Machinaries	: Ir. Moedjijarto Pratomo, M.Sc.
- Teaching Methods and Evaluation	: Dr. Ir. Darwis A. Gani, MA Suhadi Hardjo, M.Sc.

3. Sub-committee of the APP group

Coordinator	: Ir. Hidayat Syarief, MS
Secretary/treasurer	: Ir. Yadi Haryadi Ir. Endang Gumbira
Curriculum	: Ir. Machfud Ir. Endang Gumbira
Practicum	: Ir. Tien R. Muchtadi Ir. Budiatman Tatit K. Bunasor, B.Sc.
Trips/Visits/Seminars	: Drh. R. Muljono Judoamidjojo Ir. Budiatman

Subjects :

- Utilization of Agricultural By-products	: Ir. Soesarsono Wijandi, M.Sc.
- Sensory Evaluation and Quality Control	: Dr. Soewarno T. Soekarto
- Teaching Methods and Evaluation	: Dr. Ir. Darwis A. Gani, MA

III. PARTICIPANTS

The participants were teachers of the Agricultural Vocational Schools. Twenty participants were in the AM field and 20 other participants were in the APP field. The minimum educational background of the participants were graduates from their respective vocational schools. Some of them have bachelor degrees and some graduated from the University of Agriculture. The following table shows the home towns of the participants.

Table 1. Home Town of participant of 1978/1979 Upgrading Program

No.	Home Town	Number of participant	
		AM Group	APP Group
1.	Takengon, Aceh	1	-
2.	Bukit Tinggi, Sumatera Barat	1	1
3.	Metro, Lampung	3	2
4.	Tangerang, Jawa Barat	2	3
5.	Kuningan, Jawa Barat	1	-
6.	Subang, Jawa Barat	1	-
7.	Purwokerto, Jawa Tengah	1	-
8.	Temanggung, Jawa Tengah	1	3
9.	Boyolali, Jawa Tengah	4	2
10.	Sragen, Jawa Tengah	1	-
11.	Delanggu, Jawa Tengah	2	-
12.	Jember, Jawa Timur	2	3
13.	Salatiga, Jawa Tengah	-	1
14.	Tegal, Jawa Tengah	-	1
15.	Cibadak, Jawa Barat	-	1
16.	Garut, Jawa Barat	-	1
17.	Bantul, Jawa Timur	-	1
18.	Lubuk Pakam	-	-
	Total	20	20

IV. SUBJECT MATTERS

1. The subject matter of the AM group

In this 1978/1979 upgrading course the subject matter of AM group consisted of lectures, laboratory work, study tours and seminars in three subjects namely :

1. Soil & Water Engineering and Irigation Pumps
2. Agricultural Products Processing Machineries
3. Teaching Methods and Evaluation

1.1. Lectures and Practicum

1.1.1. Soil & Water Engineering and Irigation Pumps

1). Lectures

Irigation systems, water supply techniques, water distribution and managements, pumping techniques, design and performance of several kinds of water pumps, the economical and technical analysis on pumps for irigation system in a certain area.

2). Practicum

The observation and study on soil conservation, characteristic test on irigation pumps, IRRI designed pumps, construction and flume making.

1.1.2. Agricultural Products Processing Machinaries

1). Lectures

Thoory on several kinds of Agricultural Products Processing Machinaries such as Hammer mill, Burr mill, Roller mill, Cleaning machines, and Grading machines. Handling and transportation equipment for solid and liquid materials and discussion on the flow of goods and controling system.

In general the discussion was emphasized on the classification, selection, operation, care, performance, repair and operational cost analysis.

2). Practicum

Observation and study on several kinds of rice milling units, motor power measuring methods, tool making for corn shelling and technical drawing.

2. The subject matter of the APP group

The materials offered in this period (1978/1979) consisted of lectures, practicum, study tour, and scientific writing in the following subjects :

1. Utilisation of Agricultural By-products
2. Sensory Evaluation and Quality Control
3. Teaching Methods and Evaluation

2.1. Lectures and practicum

2.1.1. The Utilization of Agricultural By-products

1). Lectures

The utilization of agricultural by-products from the stand point of technology and policy on the production of new products. The utilization of the by-products of coconut, banana, paddy, sorghum, sugar cane, pepper, coffee and hides & skins.

2). Practicum

To learn effectively on the subject matters, practical work in the laboratory and in industries had been conducted.

2.1.2. Sensory Evaluation & Quality Control

1). Lectures

Discussion on the principles of sensory evaluation, techniques of evaluation methods, and equipment of evaluation, Statistical analysis and calculation, discussion on the definition of quality, grading and standardization.

2). Practicum

In order to learn more of the subject matters, laboratory work, statistical analysis, and visits to industries had been conducted.

V. EXECUTION

The upgrading course consist of lectures and practicum and was performed from February 12 until April 18, 1979. The activities were lectures, quizes, examinations, practicum, and discussion.

1. The AH group

The subjects offered were Soil & Water Engineering and Irigation pumps, Agricultural Products Processing Machinaries and Teaching Methods & Evaluation. The following table shows the detailed distribution of hours.

Table 2. Amount and Distribution of Hours needed for the AH group

Subject matter		Amount of hours	
		Hours	Class hours
I. Theory	1. Lecture	76	101,3
	2. Quiz	16	21,3
	3. Exam	9	12
II. Practical Work	1. Study Tour	28	36,4
	2. Seminars	6	8
	3. Practicum	105	140
T o t a l		240	319

1.1. Lectures and Practicum

1). Soil & Water Engineering and Irigation Pumps

This subject was offered from February 12 until April 12, 1979 including some quiz periods. The examination was held on April 16, 1979. The lectures were given in 24 hours or 32 class hours, quiz 4 hours or 5,3 class hours, examination 3 hours or 4 class hours and practicum 48 hours or 64 class hours.

2). Agricultural Products Processing Machinaries

This subject was offered from February 12 until April 14, 1979 including quiz. Examination was held on April 18, 1979. The lectures were given in 24 hours or 32 class hours, quiz 6 hours or 8 class hours, examination 3 hours or 4 class hours, practicum 36 hours or 48 class hours.

3). Teaching Methods and Evaluation

This subject was offered from February 12 until April 12, 1979. The lectures were given in 28 hours or 37,8 class hours, quiz 6 hours or 8 class hours. examination 2 hours or 4 class hours, practidum took 21 class hours.

1.2. Study Tour

The study tour had been done in two days on April 3 and 4, 1979. The objects visited were Perum Sang Hyang Seri at Sukamandi and Perum Otorita Jatiluhur. The tour took place in 28 hours or 36,4 class hours.

From the questionaire filled out by the participants, conclusion could be drawn that 75 percent of the participants considered the trip as very useful and 25 percent as fair. Concerning the objects, 70 percent of the participants considered them very good and 30 percent interesting.

1.3. Seminar and Discussion

Seminar and discussion had been done on April 4, 7 and 9, 1979 and took place in 6 hours or 8 class hours all together.

Reaction of the participants concerning this sessions was observed and 70 percent of them considered this very useful while 30 percent as fair. Ten percent of the participant considered the subject matter as very interesting and 90 percent as interesting enough.

2. The APP group

2.1. Lectures and Practicum

Lectures at the early weeks was generally conducted at 08.00 until 12.30 while the practicum from 14.00 until 18.00. Both Utilization of Agricultural By-products and Sensory Evaluation and Quality Control were offered from 10.30 until 13.30 and Teaching Methods and Evaluation was offered from 08.00 until 13.30.

Practicum had been carried out from 14.00 until 17.00.

The first and second subjects was offered in room TM I at FATEMETA building during the first month but starting on March 15, 1979 these subjects were offered at the Department of Agricultural Products Technology.

The practicum for the subjects of Utilization of Agricultural By-products and Sensory Evaluation & Quality Control were carried out at the Laboratory of Agricultural Products Technology. Practicum for Teaching Methods and Evaluation was conducted in room TM I.

Table 3. Amount of hours used for the entire upgrading course of 1973/1979

	THEORY								PRACTICAL WORK							
	Lectures		Quiz		Exam		Total		Practicum		Study tour		Seminar		Total	
	H	CH	H	CH	H	CH	H	CH	H	CH	H	CH	H	CH	H	CH
1. Soil Water Engineering & Irigation Pumps	24	32	4	5.3	3	4	31	41.3	48	64	-	-	-	-	48	64
2. Agricultural Product Processing Machineries	24	32	6	8	3	4	33	44	36	48	-	-	-	-	36	48
3. Teaching Methods & Evaluation	28	37.3	6	8	3	4	37	49.3	21	28	-	-	-	-	21	28
4. Study tour	-	-	-	-	-	-	-	-	-	-	28	36.4	-	-	28	36.4
5. Seminar & Discussion	-	-	-	-	-	-	-	-	-	-	-	-	6	8	6	8
Total	76	101.3	16	21.3	9	12	101	134.6	105	140	28	36.4	6	8	139	184.4

Note : H = Hours
CH = Class hours

Study tour and visits had also been conducted to industries such as PT Sukajujur Leather Factory at Kedunghalang, Bogor, PT Fajar Taurus and PT Kembang Kuning at Cicurug and a Small Rubber Factory at Cibadak. At the PT Fajar Taurus, the participants were exposed on the biogas making process from cattle waste. At the PT Kembang Kuning the participants were demonstrated on how to run a rice milling and how to use the by-products for fish and poultry feeding. At the rubber factory, Cibadak the participants saw how to make rubber compound and rubber sheets as a raw material for tire industries and rubber goods industries.

Another visits were conducted to a central market of fruits and vegetables, fish market, and cold storage of PT Wirontono in Jakarta. At the central market of fruits and vegetables the participants could see the machanism of receiving, storing and marketing systems of fruits and vegetables. At the fish market the participants could see the mechanism of fish marketing and handling. At the cold storage of PT Wirontono the participants could see the handling and freezing of fish, shrimp and frog legs. They also have storage of imported fruit and vegetables.

For recreation, a trip to Taman Rekreasi Cimelati and Taman Impian Jaya Ancol had been conducted successfuly.

To broadened the participants knowledge, two expert guest had been invited to offer lectures to both major fields. The first topic was the General Policy of Food Supply by Dr. Ir. I.B. Teken, staff member of the Ministry of Food Affairs. The second topic was The Principles of Teaching Methods by Drs. Abdul Muthalib, a staff member of IKIP Jakarta.

The participants should also attend three seminars of senior students of FATEMETA to familiarize themselves with seminar activities.

2.2. Evaluation and Attendance

1). Evaluation was carried out on the three subjects every Saturday mornings. The detailed evaluation on the Utilization of Agricultural By-products are as follows :

a. Evaluation on the knowledge of the by-products of coconut and bananas.

b. Evaluation on the knowledge of the by-products of sugar cane, hides and skins, and paddy.

c. Evaluation on the knowledge of the by-products of cofffee and pepper.

The evaluation on practicum was carried out only once for the entire subject.

The evaluation on Sensory Evaluation & Quality Control was carried out three times as follows :

a. The first evaluation was on the first part of the lecture concerning the general idea of quality, quality factors, grading, and standardization.

b. The second evaluation was on the second part of the lecture concerning statistics in quality control.

c. The third evaluation was on the third part of the lecture concerning the general knowledge on sensory evaluation.

The evaluation on practicum was carried out only once for the entire subjects.

2). The attendance of the participants were checked for every activity such as at lectures, practicum, seminars, and discussions and also at study tours. Attendance would influence the passing grade of the participants. Discipline of the participants was considered high because they always reported to the committee in case of abcency, although there were some who did not report.

2.3. Guidance

In writing practice, the participants were given guidance from the teaching staff in this field. The topics were assigned by the teaching staff based on the interest of each participants. The topics should also be in the field concerning handling, save keeping and processing of agricultural products like, fruit and vegetables, grain, cereals, animal products, and fish.

Most of the teaching staff were members of the Department of Agricultural Products Technology and the rest were from other institutions.

3. Certificate

Each participants who accomplished the upgrading course get a certificate with their grades on it (see table 4 and 5).

Table 4. Final grades of the participants in the field of Agricultural Machineries 1978/1979

No.	Names	Subjects				
		SWE		APPH		TM
1.	Sarno	66	B	80	B	B
2.	Sumedi	81	B	82	B	A
3.	Jaka Jarwanta	64	C	85	B	B
4.	Haryono	65	B	78	C	A
5.	Amat	59	C	78	C	A-
6.	Badarudin S.	61	C	80	B	B+
7.	Basuki Rachmat	59	C	68	C	B
8.	Soepijan	62	C	80	B	B
9.	Rudy Sumiharsono	69	B	82	B	B
10.	M.H. Siswanto	72	B	90	A	B
11.	Sarwedi	65	B	82	B	B
12.	Djaka Sukiswa S.	67	B	78	C	A
13.	Untung Witjaksono	65	B	86	A	A
14.	A.A. Rodiman	58	C	72	C	B
15.	Udin Samsudin	59	C	78	C	A
16.	A. Latif Solihin	59	C	80	B	B
17.	Idris K.N.	71	B	86	A	A-
18.	Karel Kasmijanto	63	C	80	B	B
19.	Darmansyah	58	C	66	C	B
20.	A. Yain	66	B	90	A	A

Note :

SWE = Soil & Water Engineering

APPH = Agricultural Product Processing Machinaries

TM = Teaching Methods.

Table 5. Final grades of the participants in the field of Agricultural Products Processing

No.	Names	Grades		
		I	II	III
1.	Sugiran, B.Sc.	D	D	B
2.	Sukesi, B.Sc.	C	B	B
3.	Murdiyastuti A.D., B.Sc.	C	B	B+
4.	Buddy Agus Suparman	C	C	A
5.	P. Agus Sutarno, B.Sc.	A	A	A
6.	Subagio	D	C	B
7.	Soernam	C	B	B
8.	Imam Muchjat, B.Sc.	B	C	B
9.	Pardjono	D	C	A
10.	Sudarsono	A	A	B
11.	Munawar Amirin, B.Sc.	A	A	B
12.	Sukardjo, B.Sc.	B	D	A+
13.	Hary Purnama	B	B	A
14.	Wakimin	B	C	B
15.	Sudijono	C	C	A
16.	Darwini Darwis, B.Sc.	C	D	B
17.	Usup Achmad Supri, BBA	D	D	B
18.	Ade Zainal Mubaroq	B	C	B
19.	M. Sadjiman Sp., B.Sc.	A	B	B
20.	Lili Suarsih	C	C	B

Note : I = Utilization of Agricultural By-products

II = Sensory Evaluation and Quality Control

III = Teaching Methodology

VI. CONCLUSION AND RECOMMENDATION

1. Conclusion

The upgrading course of Agricultural Vocational School Teachers was conducted for 2½ months, from February 10 until April 21, 1979. The participants had enough time for reading, practicing in the laboratory and consultation because they were only tought three subjects. In general the result was considered good.

In order to familiarized themselves with seminar, the participants should attend seminars conducted for the senior students of the FATEMETA. They also got guidance to compile papers on several topics. As shown by their final grades, the participants was considered having the ability to follow the course. In fact, the grades was A, B, C, and D. Non of the AM group got a D, while some of the APP group got a D for the Utilization of Agricultural By-products and also for Sensory Evaluation & Quality Control. Almost all participants got grades around A^+, A, B^+ and B for Teaching Methods and Evaluation because they were all teachers with a good deal of teaching experience.

2. Recommendation

2.1. To avoid unused time during the program, the time scheduling should match to the subjects to be offered.

2.2. To strenghten the understanding and learning of the subject matters, more study tours to the related institutions should be conducted. But on the other hand a recreation trip should stand as it was in order to avoid boredom.

2.3. To stimulate the participants to do the course successfully, the contribution from the Directorate of Secondary and Vocational Educations through the Faculty of Agricultural Engineering and Products Technology should be done on time or in the right time.

2.4. Better presentation and higher load of subject matters and practical excercises should be given to the participants.

第6節　その他農産加工にかかる技術の改良及び開発に必要な活動

1. キャッサバの加工技術に関する調査研究

1）調査計画

1) 調 査 計 画

SURVEY PROTOCOL
CASSAVA PROCESSING IN BOGOR AND SUKABUMI REGENCIES
MAY-JULY 1979

Rationale

Cassava is the second important staple food in Indonesia after rice. The role of cassava for food diversification is very important today and in the future. However, the post harvest handling and storage for this particular commodity have less attention, than it should. The loss of cassava during and after harvest has been estimated at the amount of 20 - 40 percent, due to many factors mostly by insect, mold and mice.

The weather condition which is hot and humid help favourable condition and good environment for the growth of insect, mold and mice. Since the storage facilities for keeping, the product is very simple and does not serve in protecting the commodity against mice and other destructive agent. It will add the heavy loss of cassava during storage.

To improve the traditional cassava processing and storage base line data is needed. Since the Bogor and Sukabumi regencies are belongs to the most potential producers of cassava in West Java, the survey area was purposely selected to cover the base line data collection from that area.

Objective

The objective of the study is to collect the base line data to get overall picture of the traditional processing and storage so that the action programes for improvement could be conducted according to the need, which include (a) raw material, (b) manpower, (c) equipment. (d) marketing and (e) traditional practice and processing.

Methodology

Due to the budget and time constraint involve, Bogor and Sukabumi regencies will be selected as the survey location.

The study will be conducted as follows: (a) Preparation, (b) Secondary data collection, (c) field survey, (d) Compiling data and (e) Evaluation and reporting.

The report will be available in Indonesia, Japanese and English. The report is expected to answer as much as possible the objective of the survey.

Time Schedule

The survey will be conducted for the period of 3 months (12 weeks), starting May 5 ending August 5, 1979.

Activities	Weeks											
	1	2	3	4	5	6	7	8	9	10	11	12
Preparation												
Secondary data collection												
Field survey												
Compiling data												
Evaluation and reporting												

Research Personnel

The principal of investigator will be AF-4 experts and Indonesia counterparts, most of they are FATEMETA staff members, as follows:

Principal Investigator:	Prof. Dr. Tsujimura
Vice Principal Investigator:	Dr. F. G. Winarno
Investigator:	Ir. Betty S.L. Jenie MS Ir. Machfud Ir. Endang Gumbira 3 STM Technician

Budget

A. Survey Expenses

1. Bogor
   - Transportation to and from Bogor
     3 x Rp. 1000.- Rp. 3.000,-
   - Local transportation
     Supervisor: 3 x 4 x Rp. 1000,- Rp. 12.000,-
     Enumerator: 3 x 7 x Rp. 1000,- Rp. 21.000,-
   - Per diem for supervisor
     3 x 4 x Rp. 7000,- Rp. 84.000,-
   - Per diem for enumerator
     3 x 7 x Rp. 5000,- Rp. 105.000,-

2. Sukabumi
   - Transportation to and from Sukabumi
     6 x Rp.1000,- Rp. 6.000,-
   - Local transportation
     Supervisor: 3 x 5 x Rp. 1.500,- Rp. 22.500,-
     Enumerator: 3 x 7 x Rp. 1.500,- Rp. 31.500,-
   - Per diem for supervisor
     3 x 5 x Rp. 7000,- Rp. 105.000,-
   - Per diem for enumerator
     3 x 7 x Rp. 5000,- Rp. 105.000,-

B. Reporting, compiling editing, translating, etc. Rp. 100.000,-

C. Honorarium technician: 3 x Rp. 10.000,- x 3 Rp. 90.000,-

Total: Rp. 685.000,-

(Six hundred and eightyfive thousand rupiahs)

D. Honorarium Investigator
   - Vice principal investigator
     3 x Rp. 30.000,- Rp. 90.000,-
   - Investigator: 3 x 3 x Rp. 20.000,- Rp. 180.000,-

Rp. 270.000,-

(Two hundred and seventy thousand rupiahs)

2) 調 査 結 果

インドネシアにおけるキャッサバの生産とその加工技術に関する中間報告(三浦喜美男)

はじめに

ジャカルタの南端からボゴールに至るまで約25㎞ジャゴラウィーハイウェイが有る。この附近の一帯はインドネシアを代表する小規模な農業経営をみることが出来る。農家の水田は1～3aの小さいものから5～7aの比較的大きく区画された水田もある。また農家の庭先にはキャッサバ，バナナ，パパイヤ，大豆等に多種にわたり人の手を煩わせない自然栽培により実をならしている。

インドネシアの農業の特徴は，大農園による集中栽培が少く，小規模でしかも多種にわたって作物を自宅の周辺に栽培する，いわゆる自家消費用栽培が多い。

1. 食用作物としてキャッサバの位置

パラウジャ（Plawija）……主要作物

1972年のインドネシアでの大干ばつを契機として，農業省はパラウジャ（米に次ぐSecondary Cropsの意）の重要性を再検討してきた。

1969年に開始された米の生産性向上のための政府の政策は，（1.収穫面積の拡大，2.高収量品種の導入による新優良品種の改良，3.農民金融，生産資金の流通）1972年の初めまで順調にのび目標を達したものの，1972年の後半に入って，5～6年ぶりの干ばつによる影響で大打撃をうけ，政府が考えついたような目標に達することが出来なかった。そのためインドネシア各地では米価の急騰をさけられず，1㎏当り70RP，あるいは100 RPに近い高値がつづいた。政府はアメリカ，タイ，ビルマ，中国とそれに日本から多量の米の輸入を行い，物価の高騰を抑える努力を行った。

以後，インドネシア政府は米の生産を高める技術的な改良をはかると共に，米に対するSecondary Cropの重要性を再検討することになった。Secondary Cropとはインドネシア語でPlawija(プラウジャ）と呼ばれ，主要作物を意味するものである。このプラウジャの生産を伸ばすことによって，現在までの米不足による栄養源を豆，キャッサバ，ソルガム等に頼ろうとするものである。

1976年次主要作物の生産

作物名	生産量(トン)
米	30,211,944
メイズ	2,511,779
キャッサバ	12,467,512
甘しょ	2,417,847
ピーナツ	332,030
大豆	481,981

(Statistical yearbook of Indonesia)

インドネシアの農業は米作中心であることは上述の表からみても明らかである。水田の収穫面積は年率で1.3～1.4%程度拡大をみており，またそれによる生産性も(1975年次に比べ1976年次には約100万トンの)増加をみている。これは年率で3～4%に値する。

水稲の中心となる所はJawa，Maduraでインドネシアの総生産の半数以上の56%にも及んでいる。また地域による陸稲の依存度が高い所はSumatera，Kalimantanの外島での作付が主として行われている。

インドネシアの第2のクロップとしてはメイズである。米に次ぐものとして重要視され，食卓で利用されている。メイズの生産の特徴は1973年をピークとして，1975年，1976年と生産の伸びがない。これはしかし政府の政策が疎かにした訳ではなく，天候による影響が大きかったと言われている。

生産地は主としてJawaが全生産の55%にあたり，他のSulawesiの10%，Sumatera 5.5%，Kalimantan 3.3%となっている。

第3のクロップとしてはキャッサバを挙げることが出来る。キャッサバは全農産物の生産割合をみると少いが(米の4/1，大豆の2/1と言われている)，消費用としては非常に重要な作物である。

一般には，澱粉用として加工されるか乾燥用(root)として農民に供される。タピオカの澱粉は国内消費され，また海外への輸出も行っている。

2. キャッサバ生産の動向

地域別にみた生産量

Province / Year	1973	1974	1975	1976
Jawa, Madura	8,102,906トン	9,648,390トン	9,309,449トン	9,152,148トン
Sumatera	1,326,111	1,227,525	1,282,400	1,371,938
Kalimantan	286,246	326,446	278,180	273,159
Sulawesi	659,945	680,763	652,408	693,871
Maluku, Irian Jaya	152,598	155,169	155,027	188,991
Bali, Nusa Tenggara	660,386	992,381	868,080	787,405
Indonesia	11,185,592	13,030,674	12,545,544	12,467,512

地域別にみたキャッサバの栽培面積

Province / Year	1973	1974	1975	1976
Jawa, Madura	1,055,823ha	1,158,128ha	1,064,739ha	1,003,040ha
Sumatera	129,411	113,783	124,012	130,182
Kalimantan	33,629	32,752	30,880	30,981
Sulawesi	84,816	78,534	71,084	72,916
Maluku, Irian Jaya	18,078	17,793	17,739	21,555
Bali, Nusa Tenggara	107,056	108,450	101,571	97,512
Indonesia	1,468,412	1,509,440	1,410,025	1,356,186

(Statistical Yearbook of Indonesia)

キャッサバの収穫面積は年次別に比較してみると，1971年～1973年まで約130万haとほぼ横ばい傾向にあったものが1974年にはピークとなり，生産面でも増加を示している。1975年以降キャッサバの生産が75%を占めていたJawa, Madura が開発が進むにつれて，住宅の増大と半比例するように減少傾向を示している。

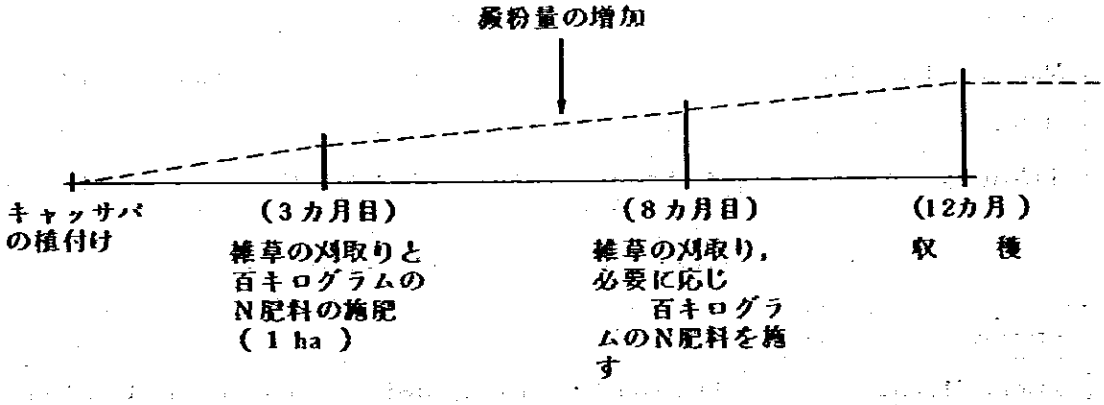
Sumatera においては，生産面積を1975年と1976年を比べた場合約6,000haが増大しており，生産面でもかなりの増加をみている。これは他の地域においての横ばい減少地域ある所とは比較できない。

3. キャッサバの将来について

1) キャッサバは自家（用）消費栽培として容易に栽培できるものの，小農経営中心の農民にはその栽培面積の拡大は困難な点が多い。また窒素肥料が多量に消費すること

から，インドネシア農民としては肥料・資材を購入するだけの財源が無く，そのために単位面積当りの収穫が上らず，逆に年々下がる一方である。

2) キャッサバはJawa，Maduraを中心とした栽培が進められて来たが，住宅事情による開発が進むにつれて当地域における面積の減少しつつあるが，Jawa 以外の外島での開墾による作付面積の拡大がない限り，その伸びが困難となってくる。



3) 澱粉生産量が他の作物と比し豊富であることにより見直され，その輸出がヨーロッパを中心として海外に順調な伸びを示している。しかし1972年の干ばつにより，一時大巾に減少しキャッサバの輸出はストックせざるを得なかった。

キャッサバは地域によってはかなり増大している所もあり，引続き海外向け生産が進められ，外貨獲得に大きな役割を持ち重要な作物である。

4. キャッサバの伝統的加工技術

① タピオカ

Tapioca fluor

a. Crude fluor processing :

- peeling
- washing
- shredding
- watering
- mixing
- pressing
- settling
- separating
- drying

b. Purification (Object in Ciluar)

- fluor collecting
- milling
- sieving
- packing

∴ marketing

キャッサバ及びタピオカ加工工業はボゴール市には個人経営として3～4軒は点在している。工業の支配人は中国系インドネシア人であり，インドネシア人農民の栽培したキャッサバを購入し fluor として販売している。

1) 剝皮作業

Setia Pabric Tapiocaの工業の裏側に位置している所，農家の旦那が鉈のようなもので剝皮作業を行っていた。剝皮は1日1人で約400㎏相当できると言われ，農家ではCyanide Content の少ない品種はこのまま食用として利用される。

また食用として利用できないキャッサバはタピオカ澱粉として加工用になり，1㎏当り10RP程度で契約し，タピオカ澱粉工業に売られる。剝皮後の皮自身は動物用と農家の牛，豚に供される。

2) 水洗い

1. 水洗い

剝皮後に籠の中に適当な量を入れて足で踏みつけたり，手で掻き混ぜる方法である。この方法は約10～15分間水の中に入れ十分水洗いする。写真にある水の色が乳白になっているのはキャッサバのExtractによるものではなく，川の上部から流れてくる濁った水のおかげである。

3) Shredding（摺砕）

この方法は次の写真でみると理解できるが，モーターによるShreddingである。剝皮されたキャッサバは水洗した後，Shredding機を用いてキャッサバをShreddingする方法である。1日当りの能力は1トンである。

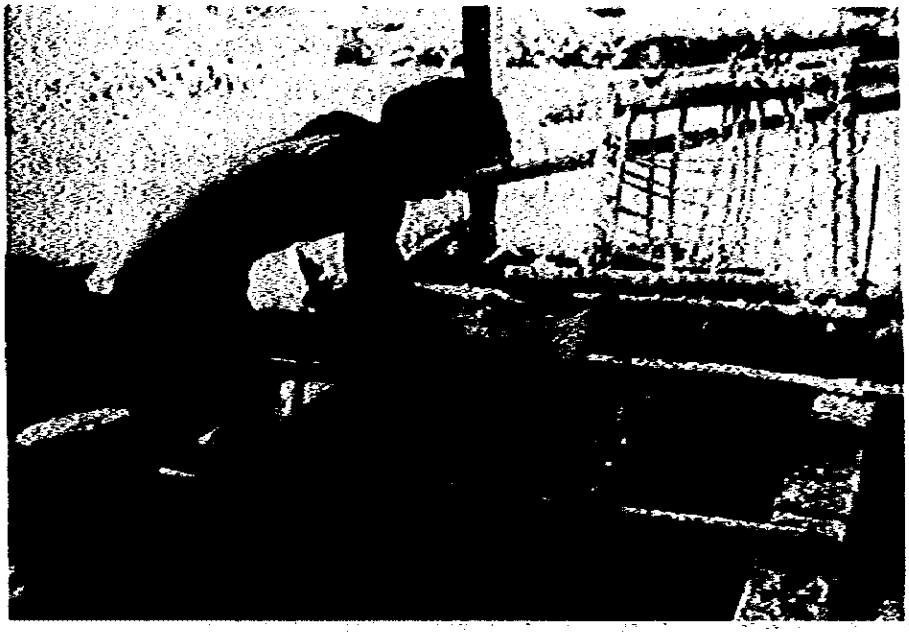
2. Shredding方法

4) 抽出作業（Extraction）

Extractionの作業は水が透明になるまで続けられる。籠の中に青い布を敷き，その上にShreddingを終えたキャッサバをのせる。残った粕は食用として（もう一度）乾燥するか，Extractionをするためとっておく。この粕をAmpasと言いシンガポールへ輸出し，澱粉の抽出と現地でもう一度行っている。

Extractionを完了したキャッサバ（粉）は農民の手により契約しているタピオカ澱粉工業へ運ばれる。会社では乾燥後Seavingした澱粉をRemiling ↔ Seavingの計4回続けて行い，タピオカに製々される。タピオカの価格はその出来ぐあいによって違うが，質の良くないものは70RP／1㎏良質のものは120～130RP/㎏とバラエティー

に富んでいる。



3. タピオカ澱粉の抽出方法

タピオカ工業

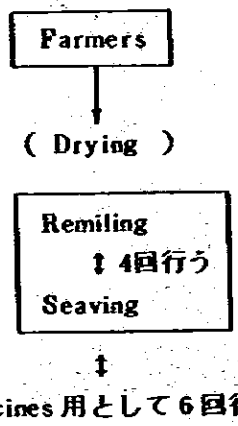
4. Setia Pabric Tapioca 工業

タピオカ澱粉の質の基準となるものは，

① 漂白であること。

② 澱粉が十分乾燥していること。

③ 粒がきめ細かいこと。



農家で抽出した物を
工場で乾燥する。

① タピオカは生産の質により，6 gradeに分類することが出来る。
(1kg 120～130 RP → 60～70 RP)

② 1日の生産量は人夫機械にもよるが，Setia Pabric Tapioca工業では10トンである。

③ この工業での大きな問題として挙げていたのは雨季による品質の低下，つまり白色のものが雨の作用により黄色を呈することがある。このため品質が一段と落ちてしまう恐れがある。

② ガプリック (Gaplek) の加工技術

Dried Cassava

ガプリックは人工的或いは天然による太陽熱を利用して乾燥した加工食品である。ガプリックの色は白褐色であり，水分を14%含んでいる。長年の間キャッサバ工業の原料として利用され，また牛の食物としても利用価値が高かった。

ガプリックの品質は水分の含有量，色彩，雑菌の発生の有無と汚物の混入等で一般には決定されている。

5) 調 整 方 法

キャッサバは12カ月の栽培期間を経過したものが一般にはガプリックの生産に適していると言われている。

剝皮後川で洗ったキャッサバは適当な大きさに切り，またキャッサバ内からのCyanide（シアン化物）を減らす理由で一昼夜水の中に浸して置く。水をきった後キャッサバを５日間天日乾燥する。

乾燥過程にキャッサバの芯の硬さをなくすため表面から棒のようなものでパタパタとたたいてやる。

ガプリックが十分に乾燥し得ない場合，粘液により交互につきやすい状態になる。乾燥が十分かどうかの目安となるものは，①色彩，②ひびが入って割れやすい，③手で折った場合音をたてて割れる等である。

Cassava root
↓
washed
↓
peeled　皮むき
↓
sliced　チップ
↓
soaked in water（one night）
↓
sun dried（5 days）天日乾燥
↓
Gaplek

6）ガプリックの調整する場合の問題点

ガプリックは多量の水分を含有することにより雑菌の繁殖が著しく，例えばAspergillus，Rhizopus，またはPenicillium等である。また他のケースとして，乾燥中にGaplekの全体が黒褐色を呈することがある。色が変るのはキャッサバの表面にEnzym Polyphonolase があらわれ，粘液が表面を覆うからである。Polyphenolが発生し空気にその表面をさらした場合，Enzymの活動が盛んとなり，黒褐色のガプリックを生産することとなる。こういうことからさけるためには乾燥中に粘液，乳液等には十分注意を払う必要がある。

7）栄養価値

ガプリックは蛋白質，脂肪の含有量が非常に少い。しかし炭水化物の含有が比較的高い。ケーキ，クラッカーの加工用として特に利用されている。

Chemical composition of cassava, gaplek and tapioca

Composition	Cassava	Gaplek	Tapioca
Protein (%)	1.2	1.5	1.1
Lipid (〃)	0.3	0.7	0.5
Carbohidrate	34.7	81.3	88.2
Water	62.5	14.5	9.1
Calcium (㎎/100g)	33.0	80.0	84.0
Phosphor (〃)	40.0	60.0	125.0
Ferrum (〃)	0.7	1.9	1.0
Vitamin B1 (〃)	0.06	0.04	0.04
Vitamin C (〃)	30.0	0	0

Anonymous (1967)

③ タペの加工技術(醗酵食品)

1. Fermented cassava (Tape)

a. Processing step : − peeling
− washing
− cooking
− cooling
− sorting
− inoculating 菌うえつけ
− wraping
− aging

marketing

b. − Nutritional value changed by processing estetical values

c. Economical aspect

d. Constrains for product development.

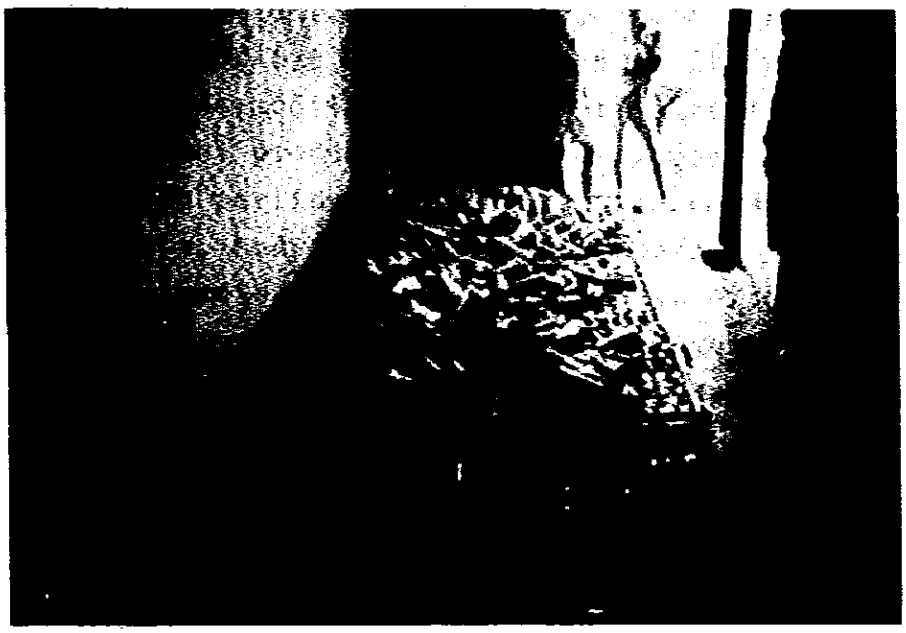
タペは商店で安価に購入できる。香りとやわらかさ，タピオカ特有の澱粉質等から市民に喜ばれている醗酵食品である。

ボゴール市の中心部から約0.5時間の所に家内工業がある。キャッサバの生産から伝統的な加工技術をみることができた。

8) Cooking

キャッサバを水で完全に洗った後ドラム管の中に入れ，約1時間にわたって煮込む。キャッサバの芯まで煮こまったらドラム管からとりだして外気に曝し，竹で編んだ台に乗せる。ドラム管の中で煮込み作業は一度に400㎏程できる。

5. 煮込み作業



6. Cooling

9) Cooling

Cooling の方法は写真にある通り，竹で編んだ台の上に乗せ約４～５時間放置する。また作業によっては一昼夜放置しておくこともある。

菌 の 接 種

Cooling が完了すると暗室に移動し，菌の接種である。用いられる菌は Rhizops oryzae か Saccharomyces ceraniae のいずれかである。暗室ではキャッサバに菌を散布する。散布後20～30時間程で菌の発育がわかり，表面が小さい粉のように白色のものが生育してくる。

Tapeの値はバッサールで60RP／㎏で購入できる。

2. ボゴール農産物市場における食品の微生物含有量に関する調査研究

この調査研究は品質管理／食品分析（醗酵食品を含む）専門家として派遣された馬場徹氏を中心に行われるものである。54年9月から約6カ月間の調査研究期間が設定されているので，ここでは計画についてのみ述べておくことにする。

STUDY ON MICROBIOLOGICAL COUNT OF FOOD COMMODITIES IN BOGOR MARKET

I. RATIONALE

The microbiological aspects on agricultural food have significant impact on the problem of spoilage of the food materials and to the safety and health of the consumers. The collected data which related to the microbiological aspects from commodities sold in the markets in Indonesia are still lacking and have been reported yet. For that reason there are some emergency need to conduct a study and collect the data and related information on the total count of microorganism which consist of bacteria, mold and yeast from various agricultural commodities, such as : a) traditional food; b) animal products particularly meat and egg; c) fresh fish particularly from salted water and some fish products, and d) cereals and tubers.

The collected data will contribute significantly to the further research and serve as invaluable materials in determining the policy on hygienic and environment sanitation.

II. RESEARCH METHODOLOGY

A. Commodity Sample

The sample which will be collected can be

grouped as follows :

1. Traditional food : tempe, tauco, soft and hard tofu, tape (white and black glutinous rice and cassava), and oncom (white and red).

2. Meat and eggs : cow, buffalo, goat, chicken, chicken egg, duck egg.

3. Fish and fish product :

4. Cereals and tubers : Rice (cere and bulu), corn shell, soybean and dried cassava (gaplek).

B. SAMPLING METHODOLOGY

All of the samples will be collected from two local markets i.e. Pasar Anyar and Pasar Bogor. For each commodity samples will be taken from 3 groceries which have been selected randomly. The method of sampling will be adjusted according to each particular commodity. Each commodity will be sampled as much as one kg from each groceries.

C. ANALYSIS

All the samples will be analyzed on the total count , however due to the various condition of each commodity, the specific microbes will also be analyzed. For example, coliform (meat and fresh fish), Salmonella (eggs), lactic acid bacteria (traditional food), mold and yeast (cereals and tubers).

list of equipments, media and procedures of analysis which will be used are shown in attachment.

III. BAR CHART

Activities	Sept.	Oct.	Nov.	Des.	Jan.	Febr.
Preparation	———					
Sampling and analysis of cereals, tubers		———				
Sampling and analysis of fish			———			
Sampling and analysis of meat and eggs				———		
Sampling and analysis of traditional food					———	
Reporting I						———
Reporting II						———

IV. INVESTIGATOR

Principle investigator : Dr. Toru Baba
Vice Principle Invest. : Dr. F.G. Winarno
Investigators : Drh. Djundjung Daulay MSc.
(Meat and Eggs)
Ir. B. Sri Laksmi Jenie MS
(Traditional Food)
Drh. Slamet Ma'oen
(Fish and Fish Products)
Ir. Budiatman
(Cereals and Tubers)

V. BUDGET

1.	Preparation	Rp. 100.000,-
2.	Raw Materials :	
	a. Meat : 30 kgs @ Rp.2.000,-	60.000,-
	b. Eggs : 18 kgs @ Rp. 800,-	14.400,-
	c. Cereals :30 kgs @ Rp.300,-	9.000,-
	d. Traditional Food : 48.kgs.@.Rp.1.000,-..	48.000,-
	e. Fish and fish products : 36 kgs @ Rp.2000,-	72.000,-
3.	Unspecified item	150.000,-
4.	Transport : 27 commodities @ Rp.10.000,- ...	27.000,-
5.	Data Tabulation	50.000,-
6.	Reporting	150.000,-
7.	Honorarium technician : 4 x 6 x Rp.10.000,-	240.000,-
	Total : Rp.	920.400,-

Equipments

1. Autoclave
2. Hot air sterilizing oven
3. Incubator (Temperature range 32°C - 35°C)
4. Balance (Sensitive to 0.1 g with 500 g load)
5. Mechanical blender (8000 rpm)
6. Blender jar (Stainless steel)
7. Mechanical shaker
8. Colony counter
9. Tally counter
10. Forceps, scalpels, knives, spoons, spatules (Stainless steel)
11. Scalpel blades (Stainless steel)
12. Alcohol lamps
13. Dilution bottles (Capacity about 150 ml)
14. Test tube (screw-cup; 20 x 150 mm)
15. Test tube (reguler; 20 x 150 mm)
16. Pipettes (Calibrated 0.01 ml; vol. 1 ml)
17. Petri dishes (15 x 100 mm)
18. Petri dish container
19. Pipet container
20. Durham tube (10 x 75 mm)
21. Glass filter
22. Test tube racks
23. Water bath.

Procedure

1. Preparation of Sample

a. Liquid Products

For nonviscous liquid products, an eleven-milliliter portion of the products will be measured volumetrically using a sterile pipet into a sterile 99 ml dilution blank (0.1% peptone water or buffer phosphate solution).

For viscous liquid products, an eleven-gram (11 ± 0.1) of the products will be aseptically weighed into a sterile 99 ml dilution blank (0.1% peptone water or buffer phosphate solution).

After sufficient shaking (optionally, using a mechanical shaker), a series of dilutions will then be prepared using dilution blank.

b. Solid or Semisolid Products

Fifty gram (50 ± 0.1) of a representative test portion of solid or semisolid products will be weighed aseptically (using sterile forceps, scalpels, knives or spoons) into a tared sterile blender cup and homogenized in 450 ml dilution blank (0.1% peptone water or buffer phosphate solution) for 2 minutes at low speed (approximately 8000 rpm).

After homogenizing, a series of dilutions will then be prepared using dilution blek.

2. Plating and Counting

One ml portion of the appropriate dilutions will be plated in duplicate. Methods of plating, media and incubation temperatures and periods are shown in Table 1.

Table 1. Methods of plating, media and incubation temperatures and periods used for enumeration of microbial group counts

Determinations	Plating Methods	Media Used	Incubation
1. Total Count of Bacteria	Pour Plate	Standard Method Agar	32°C/ 2 days
2. Total Count of Acid Producer Bacteria	Pour Plate	Standard Method Agar + Bromcresol Purple	32°C/ 2 days
3. Total Count of Yeasts and Molds	Pour Plate	Potato Dextrose Agar[1)]	32°C/ 4 days

[1)] Acidified with 10% tartaric acid to pH 3.5

Plates containing 30 to 300 colonies will be considered for counting. All colonies on the selected plate, including those of pinpoint size will be counted following the procedures suggested by Gilliland et al (1976) for total count of bacteria and Koburger (1976) for total count of yeasts and molds. All colonies with yellow halo on the selected plate will be counted for total count of acid producer bacteria (Sandine et al, 1976).

The results will be recorded as log count of organisms per gram of sample.

3. Most Probable Number (MPN)

Three replicate tubes of Lauryl Sulfate Broth (LST) with inverted Durham tube will be inoculated with 1 ml of the previously prepared 1 : 10, 1 : 100 and 1 : 1000 dilutions and will then be incubated at $32^{\circ}C \pm 0.5^{\circ}C$ for 24 and 48 hours $\pm$ 2 hours. All LST tubes showing gas production within 48 hours $\pm$ 2 hours will be recorded and by referring to MPN table for the 3 tube dilutions, the results will be reported as presumptive MPN of coliform bacteria per g (or per ml, if liquid product).

For confirmation, all positive LST tubes showing gas production within 48 hours $\pm$ 2 hours will be subcultured into 3 replicate tubes of Brilliant Green Lactose Bile Broth (BGLB) by means of the 3 mm loop and incubated at $35^{\circ}C \pm 0.5^{\circ}C$ for 48 hours $\pm$ 2 hours. All BGLB tubes showing gas production will be recorded and by referring to MPN table for the 3 tube dilutions, the results will be reported as confirmed MPN of coliform bacteria per g (or per ml, if liquid product).

$$\text{MPN/g or ml} = \frac{\text{MPN from Table}}{100} \times \text{dilution factor of the middle tube}$$

Table 2. Most Probable Number (MPN) per a gram Sample and 95% Confidence Limits

Using Three Tubes with 0.1, 0.01 and 0.001 g Portions					
Number of Positive Tubes			MPN	95% Confidence Limit MPN	
0.1	0.01	0.001	1 g	Lower	Upper
0	0	0	3		
0	0	1	3	0.5	9
0	1	0	3	0.5	13
1	0	0	4	0.5	20
1	0	1	7	1	21
1	1	0	7	1	23
1	1	1	11	3	36
1	2	0	11	3	36
2	0	0	9	1	36
2	0	1	14	3	37
2	1	0	15	3	44
2	1	1	20	7	89
2	2	0	21	4	47
2	2	1	28	10	150
3	0	0	23	4	120
3	0	1	39	7	130
3	0	2	64	15	380
3	1	0	43	7	210
3	1	1	75	14	230
3	1	2	120	30	380
3	2	0	93	15	380
3	2	1	150	30	440
3	2	2	210	35	470
3	3	0	240	36	1,300
3	3	1	460	71	2,400
3	3	2	1,100	150	4,800
3	3	3	2,400		

4. Detection of Salmonella

A 25 g sample will be weighed out asseptically into a sterile, wide mouth container with cap or suitable closure and homogenized in 225 ml Lactose Broth in a sterile blender cup for 2 minutes. After homogenizing, the lid will be loosen and incubated at 32°C to 35°C for 18 to 24 hours.

A 1 ml portion of the material will then be transferred into 6 tubes each of Selenite Cystine and Selenite F Broth and incubated at 32°C to 35°C for 7 hours.

Material from each Selenite Cystine tube will be streaked to Brilliant Green Agar plates and incubated at 32°C to 35°C for 24 hours to obtain isolated colonies of Salmonella.

Similarly, material from each Selenite F Broth tube will be streaked to Eosin Methylene Blue Agar plates and incubated at 32°C to 35°C for 24 hours to obtain isolated colonies of Shigella.

Six typical colonies (representative of each tube) from Brilliant Green Agar plates will be transferred to Triple Sugar Iron Agar and Lysin Iron Agar (streak slant and stab butt) and incubated at 32°C to 35°C for 24 hours.

Likewise, 6 typical colonies (representative of each tube) from Eosin Methylene Blue Agar Plates (colorless or pink to fuschia, translucent to opaque with surrounding medium pink to red) will be transferred to Triple Sugar Iron Agar and Lysin Iron Agar (streak slant and stab butt) and incubated at 32°C to 35°C for 24 hours.

Salmonella positive cultures show alkaline (red) slants and acid (yellow) butts, with or without H_2S (blackening of the agar) in Triple Sugar Iron Agar, and alkaline (purple) reaction throughout the medium in Lysin Iron Agar.

From each Triple Sugar Iron Agar slants showing reactions typical of Salmonella and Shigella will be inoculated to Urea agar medium and incubated at 32°C to335°C for 24 to 48 hours. Salmonella and Shigella cultures do not decompose urea medium.

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第Ⅳ章　供与機械の利用状況

1. 昭和５２年度供与機械は既存の実験室・研究室の機能・設備の改善を目的とした実験機器（ガラス器具含む）類，プロジェクトの活動に基本的に必要な車両類，事務機器類，視聴覚機器類が供与されたわけであるが別添調査結果にみられるとおり，利用管理状況は良好である。特に実験機器類の導入は実験・研究棟全体の電力upを誘発し既存の機器を含め有効利用されつつあり実験実習及び研究開発の質の向上に貢献しつつある。

2. 昭和５３年度機器はパイロットプラント用の機械が中心であるが，前述のようにパイロットプラントの建設完了が遅れていることもあり，十分な利用がなされていないのは残念であるが，IPB側もパイロットプラントの建物に直接かかわる工事を優先すると表明しており今後２－３カ月のうちには稼働状態に入れると期待される。

3. 供与機材利用状況等調査結果－(1)

1) 管理状況について

(1) 貴プロジェクトにおける実質的な機材管理者（Stock Keeper）氏名

（専門家氏名）　辻村克良（チームリーダー）

（カウンターパート氏名）　Drn. Slamet Ma on (Senion Lecturer)

Drn. Moelyono (Senion Lecturer)

(2) 機材の備品（管理）台帳の有無

○印を記入

①なし　②日本語　③英語　④現地語

日本語，英語の台帳作成中

(3) メーカーの現地代理店を通じるアフターケアーはどの程度なされているか。又現地代理店がない場合アフターケアーはどうしているか。

研究機器の現地代理店は全んどアフターサービスの能力がない。定期的（毎年１回）日本の技術者が巡回する会社もあると聞いているが，実質的にはアフターサービスを実施していない。日本の理化学機器を売込むについてこれが最大の課題であろう。

2) 輸送について

(1) 到着時点の梱包状況と望ましい梱包について

梱包があまり大きいと積降しの場合，及び倉庫への搬入にトラブルを生じることも考えられます。フォークリフトでハンドリングが容易に出来るように工

夫していただきたい。

(2) 輸送の保険期間あるいは保険求償の方法に問題点はないか。

１９７７年の供与機材は破損，紛失の物がなく保険会社との関連はなかった。

１９７８年の供与機材は開梱し検査中であり破損，紛失している物は保険求償を行う必要があろう。

3) 現地調達について

(1) 今後機材の現地調達を実施する意向があるかどうか。又どの様な機材について希望されるか。

試薬類について輸送困難な品の現地調達について研究中である。全て輸入品であるが現地の購入も可能な品もある。（主にドイツ製品）

(2) 現地調達を実施する際の実行上（手続・規定も含む）の問題点は？（別添現行通達(写)を参照のこと）

事務の円滑な運行を望みたい。研究用資材の場合少額多種類があり，宜つ正確な手規ができないので概算で資金前渡しがなされることを希望する。

4) 現在実施中の機材要請リスト・Ａ４フォームの作成とその手順（フローチャート）及び所要期間

(1) フローチャート

Ａ４フォームの作成に当つては，それ以前に相手国プロジェクト関係者を十分協議する必要がある。大学という特殊事情を考慮すると１ケ月以上はかかる。大学からイ国政府関係者に提出されたものも約２ケ月程度はかかるので日本国に着くまでは少くても２～３ケ月はかかるものと計算できる。

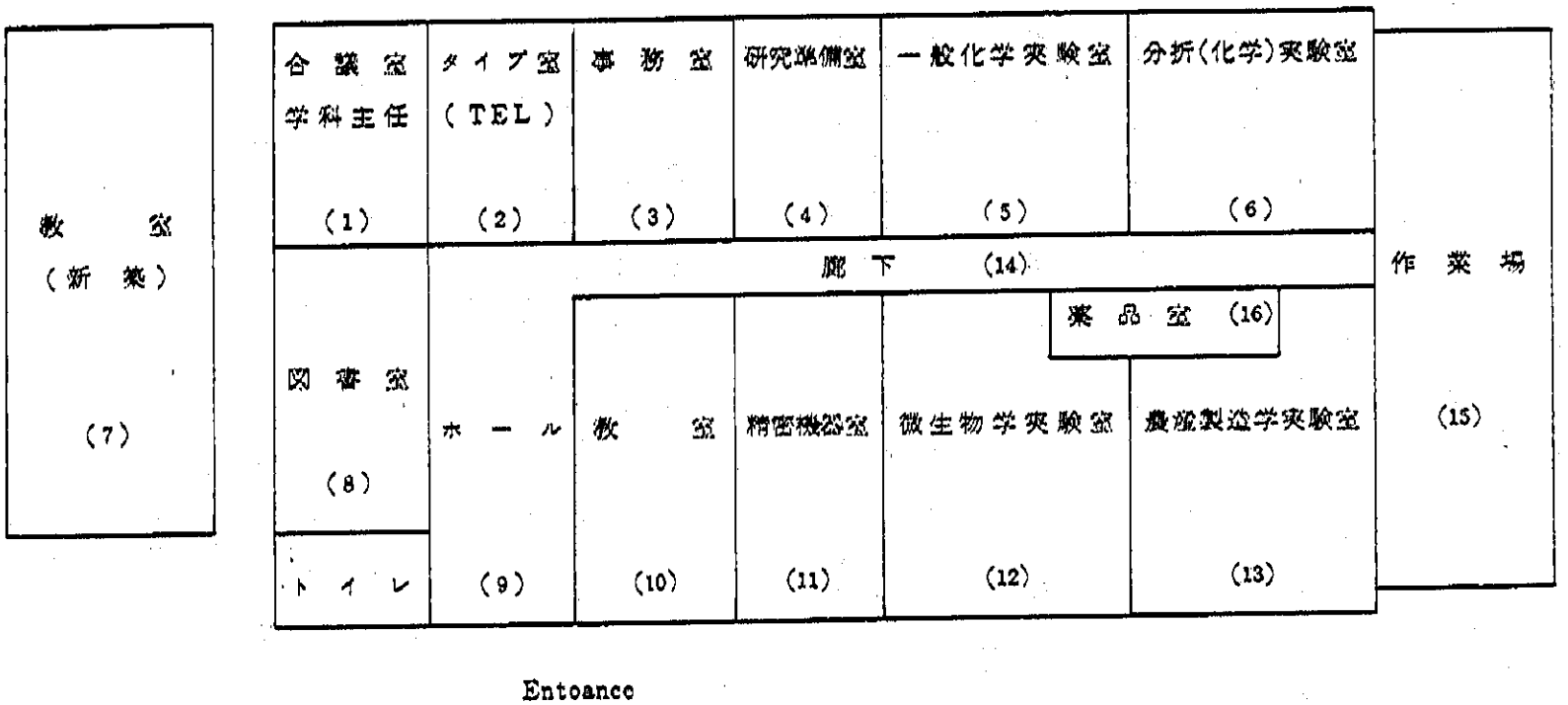
(2) 機種選定及び数量決定に際し，日本国と相手国で意見の相異があつたかどうか。あつたとすればどんな点か。又それをどのように解決したか。

相手国にとつては機種，機材のカタログが全んどない現状である。必要とするカタログは日本国で整える必要がある。

機械の価格の資料も全んどなく，現地専門家も必ずしも必要な資料をもつていない現状である。

①専門分野により　→②Working Committee →③ＩＰＢ大学(学長)
カウンターパートとの協議　で最終決定
→④教育文化省→⑤教育文化省→⑥セグネック　→⑦日本大使館
高等教育総局　(海外)協力局　技術協力調整委員会

農産加工科の実験室（概要見取図）



4　供与機械利用状況調査結果（1977年度）

A. 年間よく活用している
B. 時々活用している
C. 殆んど活用していない

番号	順位	資機材名	資機材の仕様，参考銘柄，型式又は使用目的		（利用状況） A. B. C.	保管場所 Roou No	数量	単位
1	1	コロナ　1600	RT116−KRF	トヨタ	A（調査等利用）	IPB付近	1	台
	2	コースター	BB10R−QQR	トヨタ	A（学生の工場見学）	〃	1	〃
	3	ダイナ	BU20R−QRB	トヨタ	A（パイロットプラント等）	〃	1	〃
2	（実験機器）							
	1	乾燥機	SS−1050デジタルオーブン	池田理化	AA	(5) (13)	2	式
	2	高圧滅菌器	SD−30N	トミー精工	A	(12)	1	式
	3	電気炉	TMF−120	トーマス	A	(6)	1	式
	4	蒸留水製造装置	4BD	興和商事	A	(5)	1	〃
	5	フリーザー	C−25	米国	A	(14)	1	〃
	6	生物顕微鏡	BHO−313	オリンパス光学	A	(12)	2	〃
	7	実体　〃	X−Tr	オリンパス光学	A	(12)	2	式
	8	色流計	ND504DE	日本電色工業	A	(11)	1	〃
	9	ミクロトーム	O−2605A−3	エルマ光学	A	(12)	1	式
	10	ホモゲナイザー	AM−11	日本精機	A	(11)	2	〃
	11	真空ポンプ	150VP−D	日立製作所	A	(13)	2	〃
	12	水分計	FO−IA	ケット科学研究所	A	(11)	2	〃
	13	恒温器	10−62	ヤマト科学	A	(12)	2	〃
	14	薬品棚	KO−102	入江製作所	A	(16)	2	〃
	15	深浦比重計	16本組，16 cm	日本計量器工業	A	(11)	1	〃
	16	NOYSグリーンベンチ	POV−130IBN	日立製作所	A	(12)	1	〃
	17	製氷器	FIN−13	星崎	A	(13)	1	〃
	18	遠心分離器	R90H−22	池田理化	A	(6)	1	〃
	19	分光光度計	UV100	島津製作所	A	(11)	1	〃
	20	サーモミキサー	S−5N	太洋科学	A	(6)	1	〃
	21	デシケーター	クローズレB	池田理化	A	(5)	1	〃

（利用状況）

番号	順位	資機材名	資機材の仕様，参考銘柄，型式又は使用目的	A. B. C.	保管場所	数量	単位
	22	RHメーター	F-7AD 池田理化	A	(11)	1	式
	23	ピペット箱	ピペックス6 〃	A	(6)	5	〃
	24	水質分析器	水質検査器No.8052-01他 紫田化学	A or B	(11)	1	式
	25	水分活性測定器	5803 日本商事	A	(11)	1	〃
	26	屈折糖度計	HoNoy 500	A	(11)	2	〃
	27	施光度計	PoCaX アタゴ	A	(11)	2	〃
	28	手押式ワゴン	SuS-Z 井内盛栄堂	A	(6)	2	〃
	29	〃	ST-3 〃	A	(5)	〃	〃
	30	〃	ミルズール 〃	A	(13)	〃	〃
	31	〃	スリートラック 〃	A	(12)	1	〃
	32	ゴム手袋	エプテロングローブ型 〃	B	(3)	10	ペア
	33	〃	ホームグローブ型 〃	B	(3)	20	ペア
	34	耐熱手袋	アルミナイズ加工 〃	B	(3)	10	ペア
	35	ゴム長靴	耐薬品製 〃	B	(3)	20	足
	36	消化器	SP-4 〃	A	(13)	2	式
	37	空調器	RA-218501 日立家電	A	(12)	2	〃
	38	除湿機	OD341P 松下電器	A	(11)	2	〃
	39	冷蔵庫	R480T 日立家電	A 微生物保存	(12)	1	〃
	40	〃	R231H 〃	A	(11)	1	〃
3	（ガラス器具類）		(注) 別添				
4	1	アルコール蒸留器	古沢商店	A	(6) (8)	2	式
5	（事務用機器他）						
	1	乾式複写機	112-PT-510 リコー	A	(7)	2	式
	2	映写機	IE-AA エルモ社	A		1	〃
	3	スライドプロジェクター	AS3000A 〃	A		1	〃
	4	変圧機	TO-1010 松永製作所	A 各実験室で使用		4	〃
	5	〃	TO-1020 〃	A	(3)	1	〃
	6	自動電圧調整機	SVO-2210 〃	A	(5) (6)	3	〃

（利用状況）

番号	順位	資機材名	資機材の仕様，参考銘柄，型式又は使用目的	A. B. C.	保管場所	数量	単位
	7	自動電圧調整機	SVO−2215　松水製作所	A	(12)(13)	3	式
	8	〃	SVO−2225　〃	A	(3)(5)(3)(4)	7	〃
	9	ファイリングキャビネット	プラス 05−584　プラス	A	FATEMEa	2	〃
			A4−4段	A	(4)		
	10	スチールロッカー	プラス 07−285　プラス	A	(14)	5	式
	11	スチール書庫	〃 08−206　〃	A	(14)	2	〃
	12	〃	〃 306−G　〃	A	(5)	2	〃
	13	〃	〃 503−S　〃	A	(12)	2	〃
	14	〃	〃 503−G　〃	A	(14)	2	〃
	15	スチールキャビネット	プラス 08−419　プラス	A	(3)	1	〃
	16	レターケース	〃 09−210　〃	A	(4)(3)	2	〃
	17	耐火金庫	〃 06−254　〃	A	(1)	1	〃
	18	雑誌架	〃 09−776　〃	A	(16)	1	式
	19	グリーンボード	〃 RW−36−C　〃	A	(9)(10)	2	〃
	20	中量ラック	プラス 2467−M　プラス	A	(4)	2	〃
	21	物品棚	〃 6315　〃	A	(8)	4	〃
	22	工具セット	〃 39−594　〃	A	(6)	2	〃
	23	スチープラー	〃 PS−10　〃	A	(3)	6	〃
	24	スチープル	〃 10　〃	A	〃	12	〃
	25	スチープラー	プラス PS3−U　プラス	A	〃	2	〃
	26	スチープル	〃 PS3−U　〃	A	〃	6	式
	27	ペーパーパンチ	〃 320　〃	A	〃	4	〃
	28	ドリルパンチ	プラス 30−414　プラス	A	〃	1	〃
	29	ペン	ウナダマジック 700　ウナダマジック	A	〃	6	〃
	30	マーカーペン	プラス 31−194,208　プラス 216	A	(4)	1	〃
	31	鉛筆けずり	プラス P−7　プラス	A	(5)(3)	2	式
	32	消ゴム	プラス 1501　〃 （白・砂ゴム両用）	FATEMEA		2	箱

（利用状況）

番号	順位	資機材名	資機材の仕様，参考銘柄，型式又は使用目的	A. B. C.	保管場所	数量	単位
	33	テープカッター	プラス 37-966 プラス	本館及び実験室で		2	式
			〃	利用			
	24	ステンレスはさみ	〃 200 〃	〃		2	式
	25	ダブルクリップ	35-440 〃	〃		100	個
			35-459 〃	〃		100	〃
			35-407 〃	〃		200	〃
			35-475 〃	〃		200	〃
			35-483 〃	〃		200	〃
	26	目玉クリップ	35-491 〃	〃		100	〃
			35-505 〃	〃		100	〃
			35-513 〃	〃		200	〃
			35-521 〃	〃		200	〃
	27	ゼムクリップ	35-645 〃	〃		20	箱
			35-661 〃	〃		20	〃
			38-210 〃	〃		10	〃
	28	コンベックスルール	48-186 〃	〃		2	個
			48-194 〃	〃		2	〃
			48-208 〃	〃		1	〃
	29	ファイル	プラス 460-A プラス	〃		15	冊
			〃 560-A 〃	〃		10	〃
	30	集計用紙	〃 SK-11 〃	〃		40	〃
			〃 SK-12 〃	〃		40	〃
			〃 SK-13 〃	〃		30	〃
	31	方眼紙	B5コクヨ-15 コクヨ	A，FATEMETA	本館及	10	冊
			44 〃 -19 〃	び実験室で利用		10	〃
			B4 〃 -14 〃	A 〃		10	〃
			B3 〃 -13 〃	〃		100	枚
			B2 〃 -12 〃	〃		100	〃
			B1 〃 -11 〃	〃		50	〃

（利用状況）

番号	順位	資機材名	資機材の仕様，参考銘柄，型式又は使用目的	A. B. C.	保管場所	数量	単位
	32	ノート	縦型40枚(コクヨ1-201-A)	本館及び実験室で		20	冊
			〃（コクヨ1-5-A）コクヨ	利用		30	〃
	33	レポート用紙	A4縦型60枚目盛付 〃	〃		10	〃
			B5 〃 50枚 〃 〃	〃		20	〃
	34	タイプライター	プラスPW-93(電) プラス	A，FATEMETA 本館		1	式
	35	タイプライター	アドラーガブリエル アドラー 5000（電）	A	（2）	1	式
	36	タイプライター	アドラーティッパ アドラー	A	（2）	2	式
	37	タイプライティングリボン	ペリカン，ITリボン ペリカン ポリティ	A	（2）	12	〃
	38	裁断機	プラスG-100 プラス	A	（4）	1	式
	39	〃	プラス12-D 〃	A，FATEMETA	（4）	1	〃
	40	計算機	キャノンパームF-61 キャノン	A	（3）	2	〃
	41	〃	キャノンL-1612 〃	A	（3）	1	〃
	42	鉛筆	トンボ8900(赤) トンボ	FATEMETA		4	ダース
			〃 （黒HB） 〃	A 〃		4	〃
			〃 （2H） 〃	A 〃		4	〃
	43	巻尺	セキスイエスロン 積水樹脂	A 〃		2	式

5. ガラス器具類及び薬品について

ガラス器具類，ゴム栓，濾紙，ブラシ，二連球など小器具は分析（化学）実験室内にある，戸棚に整理保管し，学生実験及び教員の研究等必用に応じとりだすことになっている。

また，シアン化カリウム（Potassium Cyavide）等の化学薬品は微生物学実験室内並びに薬品室に整理し，使用している。

第V章　研修員受入れ

第1節　研修修了者に対するインタビュー結果について

プロジェクト発足以来，８名の研修員受入れが行われた。研修期間についてはIPB側の事情により３週間～１カ月が５名もあり，視察（１名）は別として技術研修が１カ月というのはいずれにしても短期間すぎる。これについては５５年度以上は３カ月以上受講できるようIPBも約束した。

７名（研修修了者は８名であるが１名（Mr. Zein Nasution）はフィリピン大学でDocterコースに留学した）に対するアンケート及びインタビュー結果は次のとおりである。

問３～問７については集計の結果を表に記入した如く，滞在中の待遇に対する不満は全く聞かれなかった。

問８の現在の担当授業課目に関しては全員が研修内容と一致していた。

しかし，問９の研究分野と研修内容との関連は，４名が一致していたが，他の３名は全く関連のない研究課題であった。

問１０で研修の効果について質問をしたところ，全員がその結果がよかったことを認めており，特に研修内容と担当授業課目が一致していることから，学生の教育に非常に役に立っていることがうかがわれた。

自身の研究にどのように役立っているかについては，一応役立っていると述べられていたが，反面日常の教育その他の業務のため，研究に費やす時間がほとんど得られないのが現実のようであった。事実，我々が度々研究室へ訪ねた際も，彼等はほとんど不在であり，実験を行なっているのが見られなかったことからもうなずけることであった。

しかし，研修で得た成果を何らかの形で研究活動に生かしたいという意欲は充十に感じられ，本プロジェクトの主旨からは多少はづれる恐れはあろうが，研究面における指導者の派遣による援助も，プロジェクトに対する意欲を持たせる意味では良い方法であると考えられる。

問１１の研修スケジュール（プログラム）に対しては，凡そ賛成の意見であったが，中には少し忙しすぎたという者も居た。

また，問５の研修期間に対する意見でも半数が短か過ぎると述べており，インタビューの結果でも，もう一度研修に行きたいという意見が多かった。これは研修を受け入れた我々も１～２ケ月というのは中途半ばであり，もっと期間を長く，ゆっくりとしたスケジュールの方が良いのではないかという考えと一致している。

しかし，これはあくまでも研究に関しての研修を目的としており，前述の如く，本プロジェ

クトの主旨とは多少異なる恐れは充分に感じられる。

最後に，彼等の本（AP4）実習場に対する心構えは，自身の担当するラインに関連する研究については興味を持っているが，実際に自分自身で機械を動かして実習の指導を行おうという意欲はあまり感じられず，国状の差異から仕方のない面もあるが，実習教育のあり方についての研修生に対する教育，説明の必要性が強く感じられた。

表－１４　研修員アンケート調査結果一覧表

1. Name:	Soesarsono Wijandi	Slamet Ma'oen	Jenny D. Saono	Ansori Rahman	Darwin Kadarisman	K. Semangat Ketaren	Goutara
2. Study subject in Japan:	Educational Institusions in Agricultural Field	Pilot Plant Management	Food Microbiology	Food Fermentation	Food Packaging	Agricultural Product Processing (Edible fat and oil)	Agriculture Products Processing (Sugar)
3. Duration of study in Japan:	20 days	1 month	2 months	1 month	1 month (Jan. '78 - Feb. '79)	2 months	30 days
4. Facilities & conditions:	Good	Excellent	Good	Good	Good	Good	Good
5. Duration of study was:	Appropriate	Too short	Appropriate	Too short	Appropriate	Too short	Too short
6. Allowance for living while you stayed in Japan:	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate
7. Accommodation for living in Japan:	Good	Excellent	Good	Good	Excellent	Good	Good
8. Teaching subject at present at Bogor:	1. Quality Control 2. Storage	Food Science - of animal food stuff Food Processing - of animal food stuff Principle of Food Preservation, and Sea-food Quality Control	Food & Industrial Micro-biology	1. Food Fermentation 2. Food Chemistry	Fiber Properties	Agricultural Product Processing (Edible fat and oil)	Sugar and Rubber Processing
9. Research title at present at Bogor:	(1) Sago Utilization	(1) Traditional Milk Processing (Handling)	(1) Yeast for Industry (2) Microorganism in Taoco	(1) Making an Grinding Equipment for Tea Leaf	(1) Mix Pulping at Hard Wood and Bamboo	(1) Fractionation of Turpentive Oil (2) Nehaisation of Crude Coconut Oil (3) Extraction of Oleo-resin and Volatile Oil of from Red Pepper	(1) To make high fuctose syrup from cassiva and cane
10. Do you find your study/training useful for your present teaching/research?	Yes, particularly for teaching and management	Yes, all information of the processing technic and the improvement of traditionally processed product is truly useful for Indonesia.	Very usefull, because I was yearning to know/ to practice "identification of yeast" which I have not got at the univ. Wisconsin USA during study, nor in Holland during training.	Useful became the subject of the training us appropriate with my field of teaching. But to develop my field into pilot scale it's still difficult, because, I have not been the pilot plant of for fermentation during my training.	In future the training in Japan are useful for my present teaching/research (banboo preservation), because in Japan I have learned how to preserve bamboo with caustic soda (NaOH).	It is useful for teaching and research.	Many kind of study is useful for teaching and research especially in sugar technology.
11. Comment suggestion on the program on the whole:	1) Most of the program are well organized. 2) Follow-up of the training program e.g. between Japanese institutions and private campanies and Indonesian participants should be encouraged on mutual cooperation.	The program was very set up, very well arranged, and comprised the subjects that is supposed to presented as stipulated in the A_3 and A_3 form.	1) More subjects of study should be scheduled, so that all the participants are kept busy. Not only few are tightly scheduled and other very loosely. 2) Because of shortage of of time, I was only able to get identification of yeasts, while my goal was also identification of molds & lactics.	During my training I visited "Culture Seed Factory" in Kobe. I suppose that the Culture Seed Factory could be developed in Indonesia because many culture for fermentation should be made and standarized in Indonesia.	During my training in Japan, I have visited many packaging factories in Tokyo, Nagoya and Kyushu. Now I had know about packaging in general. But I want to learn more detail so that I want to stay (training) in Japan again.	In the next training, I suggested that field training activity, more intensive.	It is better when I can see there whole processing of sugar (beet, cane), and can sale some books about sugar technology. And also I shall need to see and study about rubber technology.