

PROJECT
FOR STRENGTHENING THE FOOD INDUSTRIES
RESEARCH INSTITUTE

Result of Activities 1
 The Characteristics of quality of major processed food in Vietnam are classified

1.1. The characteristics of 5 processed foods are classified by analysis of the sample

| No. | Name of target foods | Characteristics |
|-----|-----------------------|---|
| 1 | INSTANT NOODLE | Sodium chloride, moisture and peroxide indices for instant noodle are not acceptable to TCVN. Salt indices for instant noodle is not very reasonable (TCVN allow very low concentration). Vermicelli (Bun rieu cua) seems to be unacceptable product as to TCVN. |

| | | |
|---|----------------------------------|---|
| 2 | MILK & DAIRY PRODUCTS | Almost kind of products are acceptable to TCVN, but coliform was founded in imported milk powder, that maybe conservation condition not good. TCVN omit some indices(Lactose, milk solid, acid value) |
| 3 | FRUIT JUICE | Some kinds of product (Peach nectar, Orange juice) were unacceptable to TCVN, JAS. Mould and yeast ware founded in Peach nectar, Orange that maybe bad pasteurization condition. |

| | | |
|---|----------------------|--|
| 4 | CONFECTIONARY | Almost quality indices of confectionary are acceptable to TCVN except Chocolate coating cake (Chocovina). Mould and yeast ware founded in this product. It is shown the possibility of sample hole is on package or contaminated with mould during cooling process. Should choose total sugar indices for screening items. |
|---|----------------------|--|

| | | |
|---|--------------|--|
| 5 | PLANT | |
| | OIL | <p>Moisture , acid value and unsaponified matter are higher than standard for food oil.</p> <p>Raw materials need refine.</p> <p>In fact, palm oil imported from Malaysia, Indonesia to Vietnam is Olein as semi-product for re-refining process, then mix with other oil to fulfill edible oil product delivering on market. The appearance indices which shows the characteristic of palm oil to be transparent at 50⁰C. This indices omit in TCVN, it should be present in standards for Palm oil for prove the origin of oil materials.</p> |

1.2.The number of analysed sample are 53

- Instant noodle: 5 samples
- Fruit juices: 8 samples
- Milk and Dairy products: 24 samples
- Confectionary: 9 samples
- Plant oil: 7 samples

1.3. The number of analytical items are 391

- Instant noodle: 5 kinds x 12 items/kind = 60 items
- Fruit juices: 13 kinds x 7 items/kind = 91 items
- Milk and Dairy products: 16 kinds x 13 items/kind = 208 items
- Confectionary: 6 kinds x 12 items/kind = 72 items
- Plant oil: 6 kinds x 8 items/kind = 48 items

1.4. The number of the research of the improved methods are 43 (target is 50)

- SMEs would like to improve their product quality
- SMEs (rice spirit, wine): how to preserve wine; bad odor; lack of knowledge of strain; precipitation, colling temperature is high
- SMEs (beer): bottling by hand, facilities is old, needs analysis techniques
- SMEs (Nem chua, spring roll, surimi): hygiene control
- ...

1-5 The Characteristics of the Project target

| | Target | Characteristics |
|---|-------------|--|
| 1 | Strain | <p>Traditionally a strain for rice spirit from northern, mountain area of Vietnam has been used for hundreds years. The taste has its specific aroma. The other method (solid) has been used at Hoa Binh Province.</p> <p>FIRI has been providing strains for beer, rice spirit and fruits wine to SMEs for several years. But recently the quality of other strains made in Vietnam has been developed. Those SMEs needs technology assistance to develop their products.</p> |
| 2 | Rice spirit | <p>Rice spirit is the traditional beverage for Vietnam. Vietnamese men drink it of more than 30% of ethanol in any occasions. Drinking alcohol together is necessary to make good human relations in the local areas. A few women drink.</p> <p>Most of the producers are farmers with simple distillation system. The rice spirit from the system contains components which affects health. We have Sake, sweet Sake, siro-zake in the local market.</p> <p>Some of the villages make cooperative for more profit. Some SMEs built towers for distillation.</p> |

| | | |
|---|------------|--|
| 3 | Fruit Wine | <p>Grape wine is grown at Da Lat area by the assistance of France. The price of Da Lat Wine is about 2USD/bottle (750ml). This is the only grape wine company in Vietnam. The grape grown around Hanoi is suitable for eating in raw but not for wine.</p> <p>The wine from Lychee, pineapple, apricot and mulberry or mixture of them have been used for special events such as wedding ceremony in northern Vietnam. The price of the fruit wine is about 1 USD/bottle. SMEs which produce wine need technology assistance to develop their products in keeping red color and avoiding oxidation.</p> <p>Recently people tend to consume imported wine. This means not only increasing the income but the shifting the taste of alcohol from higher ethanol content (30-50%) to lower ethanol content.</p> |
| 4 | LAB | <p>LAB is used traditionally in Vietnam. We have the products such as vegetable (eggplant, mustard vegetable, cabbage, chili, garlic etc) pickles, shrimp fermented products (Tom Chua, Mam Tom), fish fermented products (Nuoc Mam), meat fermented products (Nem chua). We have miso and soy sauce which are similar with Japanese ones but those are in the village level/</p> |

| | | |
|---|--------------------|---|
| 5 | CD | This is relatively new field for Vietnam. Some foreign companies are using CD to keep aroma longer. Pharmacy companies start to plan to use it. FIRI can produce alfa and beta CD from cassava starch. |
| 6 | Simple Analysis | Most food processing SMEs do not have analysis equipment. The reasons are that they are not interested in the analysis and that they request the analysis nearby analysis center. |
| 7 | Sensory Evaluation | This is relatively new field for Vietnam. It has just started using this method in several companies. Some universities also have just started to teach. At first we have to define/ create technical words of Vietnamese for this field. |

Thank you very much for your attention!

MINISTRY OF INDUSTRY
FOOD INDUSTRIES RESEARCH INSTITUTE

REPORT OF JICA PROJECT

STRENGTHENING OF FOOD INDUSTRIES RESEARCH INSTITUTE

Activity II: TRANSFER OF BASIC AND APPLIED TECHNOLOGY OF
MICROBIOLOGY AND ENZYMOLOGY

Reporter: Ass. Prof. Dr. Nguyen Thi Hoai Tram
Position: Vice-director of FIRI, Project Manager

HANOI, MAY 2007

ACTIVITY II

**Transfer basic and applied technology on the
microbiology and the enzymology**

Group of Participants

Period I (9/2002-11/2005) Period II (12/2005-3/2007)

| | |
|--|----------------|
| Strains | Strains |
| Enzyme synthesis | Rice spirit |
| CDs production | CDs production |
| Lactic acid fermentation and recovery | Lactic acid |
| Wine production | Fruits wine |

7 Departments: Microbiology, Fermentation, Enzyme & Protein, Beverage,
Starch & Sugar, Food & Nutrition, Plant Scientific & Co – Operation.

Conditions and equipment for activity

| Items | Project | Counter-Budget | Other |
|----------------------|---------|----------------|-------|
| Common Lab. | X | X | X |
| Working group | | | |
| Strains | X | X | X |
| Rice spirit | X | X | X |
| CDs | X | X | X |
| Lactic acid | X | X | X |
| Fruits wine | X | X | X |

List of Long-Term and Short-Term Experts

| | |
|---------------------------|----------------------------|
| Period I (9/2002-11/2005) | Period II (12/2005-3/2007) |
|---------------------------|----------------------------|

Long-Term Experts (2):

Dr. Isamu Takagahara,
Dr. Akiko Murayama.

Short-Term Experts (11 person/13 time):

| | |
|------------------------|------------------------|
| Dr. Yusaku Fujio (2) | Dr. Seiko Shigeta |
| Dr. Shinji Miyado, | Dr. Kunio Ohmija |
| Dr. Hisao Nakanishi, | Dr. Takumi Takayma (2) |
| Dr. Hitoshi Utsunomiya | Dr. Kihachiro Ogawa |
| Mr. Koji Suginami. | Mr. Nobuo Shinohara |
| | Dr. Yoshihiro Komiyama |

List of Counterparts training in Japan (21)

Period 1 (9/2002-11/2005) Period II (12/2005-3/2007)

| | |
|-------------------|------------------------|
| Nguyen Thuy Huong | Le Van Bac |
| Pham Thi Thu | Nguyen La Anh |
| Tran Minh Ha | Dang Hong Anh |
| Ngo Thi Van | Do Thi Thanh Huyen |
| Vu Nguyen Thanh | Tran Thi My Linh |
| Dinh Thi My Hang | Bui Bich Ngoc |
| Dang Thu Huong | Nguyen Thi Huong Giang |
| Truong Huong Lan | Dam Lam Thanh |
| Do Trong Hung | Vu Thi Thuan |
| Nguyen Minh Chau | Nguyen Thi Viet Anh |
| | Trinh Thanh Ha |

List of Counterparts training in Viet Nam (18)

Period 1 (9/2002-11/2005) Period II (12/2005-3/2007)

| | |
|-------------------|----------------------|
| Duong Anh Tuan | Khuat Thi Thuy |
| Dao Anh Hai | Nguyen Thanh Thuy |
| Trinh Thi Kim Van | Nguyen Thuy Linh |
| Do Thi Thuy Le | Le Thi Mai Huong |
| Nguyen Thanh Ha | Nguyen Thi Minh Hanh |
| Pham Duc Toan | Lai Quoc Phong |
| | Nguyen Anh Tuan |
| | Thai Thi Hao |
| | Nguyen Thanh Hung |
| | Nguyen Thi Hong Tu |
| | Nguyen Thu Van |

| Results | | |
|---|----------------|------------------------------|
| Indicator | Results | Comparison with total |
| 6 Patent/ utility solutions | 6 | 6/6 |
| 40 Proceedings | 32 | 32/40 |
| 35 technical guidance | 15 | 15/26/35 |
| 150 strains isolated | 156 | 156/150 |
| 90 identified strains | 93 | 93/90 |
| 66 characterized strains | 67 | 67/66 |
| 10 specified useful strains | 10 | 10/10 |
| 1 specified enzyme | 1 | 1/1 |
| 6 methods of screening developed | 6 | 6/6 |
| 8 FIRI researchers obtained the methods | 9 | 9/8 |
| 25 manuals | 25 | 25/25 |
| 16 seminars/ workshops | 14 | 14/17/16 |
| 20 on job training | 10 | 10/11/20 |

Conclusions

For Activity II

Conclusions

1. Activity II was carried out with high efficiency and was closed with the plan of project.
2. FIRI's researchers improved their ability of application for the utilization of microorganisms and enzymes; improved their style of study works and ability of technical guidance and technological transferring consulting to/for SMEs.
3. Working conditions and equipment for study were developed.
4. FIRI's Counterparts and JICA's Experts were cooperated and worked together effectively

Problems

1. Incomplete the number of technical guidance to SMEs and consulting (on job training) for SMEs.
2. Transferred technologies were incomplete in content.
3. Investment for genetic engineering was insufficient in order to produce recombinant strains.
4. Enzyme production by wild type strains were so low, difficult to be applied for production.
5. Insufficient investment for pilot production facilities.
6. Difficult to interact with SMEs.

Comment

1. Complete the the number of technical guidance to SMEs and consulting (on job training) for SMEs.
2. Receive the completed technologies in need.
3. More investment for genetic engineering.
4. Recombinant strains and technology for enzyme production is needed.
5. More investment for pilot production facilities.
6. Complete technology is in need.

For Project

Project was carried out with high efficiency. Investment fits to the purposes. Equipments were utilized efficiently, technology transfer by JICA experts and during training in Japan ensure long term research capacity of FIRI.

Positive factor:

1. Most of JICA experts were well prepared, active and work efficiently
2. FIRI CPs were active and motivated
3. High demands from SMEs
4. Flexible coordination by project manager board

Negative factor:

1. Some JICA experts were not well prepared.
2. Working motive of many FIRIs CPs need to be improved.
3. Difficulties during interaction with SMEs.
4. Transferred technologies were incomplete in content.
5. Insufficient investment for pilot production facilities.



REPORT OF ACTIVITY III

TRANSFER THE BASIS AND PRACTICAL TECHNOLOGY OF ANALYSIS OF FOOD COMPONENTS AND FOOD QUALITIES

3.1 ANALYTICAL METHODS ARE TRANSFERRED TO FIRI'S RESEARCHERS (*Total 41 methods*)

| No | Date of transferred | Number of analytical method | Name of expert |
|----|---------------------|-----------------------------|---|
| 1 | 2003 | 21 | Mr. Saito |
| 2 | 2004 | 10 | Mr. Saito; Mr. Asanuma; Mr. Nozawa |
| 3 | 2005 | 6 | Mr. Nozawa Mr. Utsunomya Mr. Mizuno |
| 4 | 2006 | 4 | Mr. Kodama Mr. Takase |

3.2 THE NUMBER OF ANALYTICAL ITEMS IMPLEMENTED AT TECHNOLOGY TRASFER (*Total 105*)

| No | Date of analysis | Name of Items | Result of analysis |
|----|-------------------|--|--------------------------------------|
| 1 | 4/ 2003 - 8/2003 | General food components | 18 sample 110 tests |
| 2 | 5/2004 - 6/2004 | Total amino acid form Nitrogen; Na; Ca; K; Fe; Pb; P | 58 sample 380 tests |
| 3 | 1/2004 - 8/2004 | Vitamin A; B1; B2; C; E; β-Carotene | 16 sample 52 tests |
| 4 | 2/2005 - 3/2005 | Esters and higher alcohol in Wine | 20 sample 40 tests |
| 5 | 10/2003 - 12/2003 | Food additives, Colors | 24 sample 57 tests |
| 6 | 11/2004 -12/2004 | Aflatoxin B1; B2; G1; G2 | 11 sample 30 tests |
| 7 | 10/2004- 11/2004 | Pyrethroids (7 Items) Organo-chlorines (13 Items) | 11 sample 30 tests |
| 8 | 26/7/05 – 18/9/05 | Methyl-Hg; Total Hg; As | 15 sample 30 tests |
| 9 | 19/12/05- 19/1/06 | Chloramphenicol, tetracyclines, Synthetic antibacterial (6 Items) | 11 sample 33 tests |
| 10 | 11/2006 | Flavor; Total count; Coliforms. Simple analysis (3 Items) | Training course in HaiDuong Prov. |
| 11 | 2004-2006 | Organic acids (6Items) Mono and di- saccharides (5 Items) | 150 sample 300 tests |

3.3 NUMBER OF IMPROVED QUALITY EVALUATION OF PROCESSED FOODS

| No | Name of improved quality evaluation | Name of processed food |
|----|---------------------------------------|------------------------------|
| 1 | Analytical method of maltose by HPLC | Malto. oligo- saccarid; wine |
| 2 | Analytical method of glucose by HPLC | -- |
| 3 | Analytical method of fructose by HPLC | -- |
| 4 | Analytical method of sucrose by HPLC | -- |
| 5 | Analytical method of lactose by HPLC | -- |

3.4 THE NUMBER OF DEVELOPED MANUALS
(Total 10 manuals)

| No | Name of manual | Remarks |
|----|-------------------------------------|---------------------|
| 1 | Analytical method of alcohol | Transferred to SMEs |
| 2 | Analytical method of total acid | -- |
| 3 | Analytical method of aldehyt | -- |
| 4 | Analytical method of furfural | -- |
| 5 | Analytical method of ester | -- |
| 6 | Analytical method of calcium | -- |
| 7 | Analytical method of magnesium | -- |
| 8 | Analytical method of iron | -- |
| 9 | Analytical method of chloride | -- |
| 10 | Analytical method of total hardness | -- |

3.5 THE FREQUENCY OF USING DEVELOPED MANUALS
(Total 10 manuals)

| No | Name of manual | Remarks |
|----|-------------------------------------|---------|
| 1 | Analytical method of alcohol | Used |
| 2 | Analytical method of total acid | -- |
| 3 | Analytical method of aldehyt | -- |
| 4 | Analytical method of furfural | -- |
| 5 | Analytical method of ester | -- |
| 6 | Analytical method of calcium | -- |
| 7 | Analytical method of magnesium | -- |
| 8 | Analytical method of iron | -- |
| 9 | Analytical method of chloride | -- |
| 10 | Analytical method of total hardness | -- |

ACHIEVEMENTS

| No | Indicators | Target of activities | Achievements | Note |
|----|---------------------|----------------------|--------------|-----------|
| 1 | Analytical method | 41 | 41 | Annex 3-1 |
| 2 | Analytical items | 100 | 105 | Annex 3-2 |
| 3 | Development manuals | 10 | 10 | Annex 3-3 |
| 4 | SOPs | 60 | 63 | |

OTHERS

1. Analyzed samples for activity I, II & IV.
 - 56 samples
 - 200 Items
2. Analytical samples increased year by year: About 30 - 50 percent per year.
3. Food Analysis and Assessment Department became an official member of the VILAS (Accredited ISO/IEC- 17025) on 23th march, 2007.

SOME ACTIVITIES OF ANALYSIS GROUP.

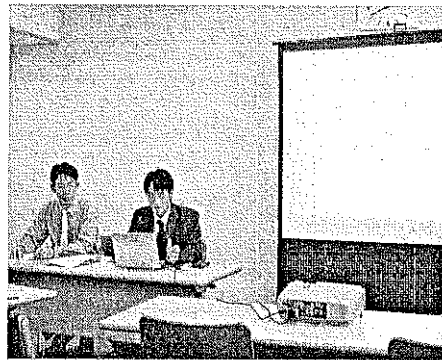
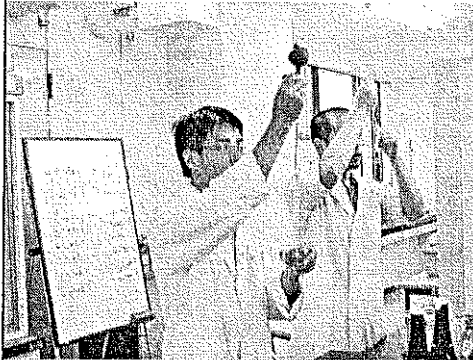


JICA's expert transfers analytical technique to FIRI's researchers

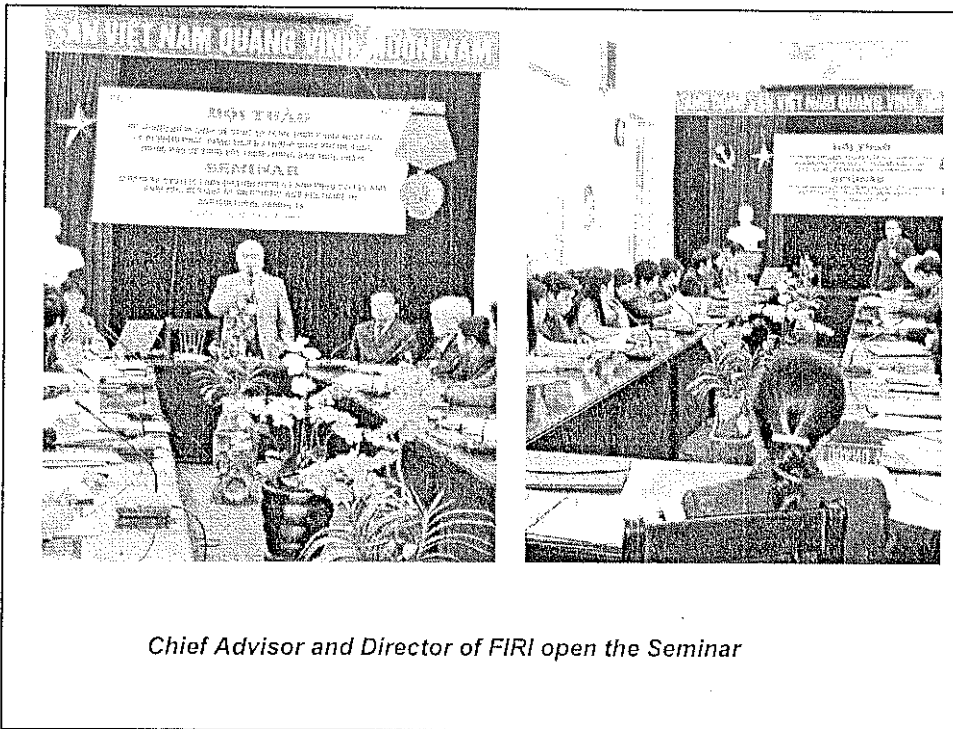


FIRI's Researchers discuss the result of tests

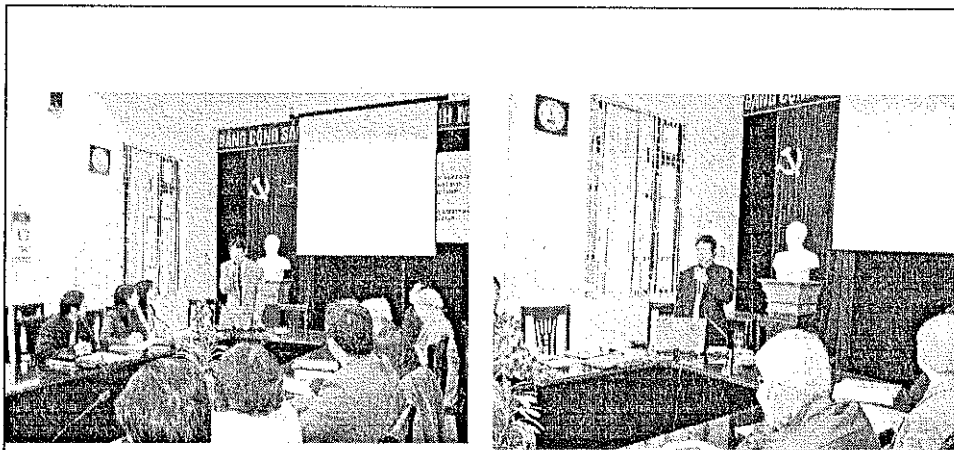
(To be continue.....)



C/P studies and reports the result of the training course at Lab. in Japan



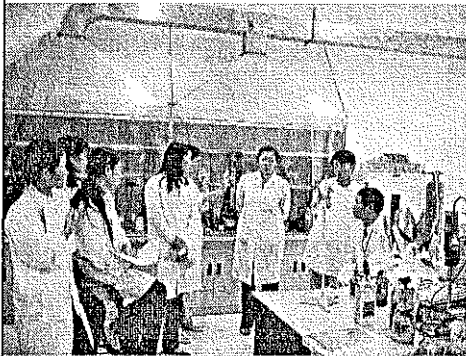
Chief Advisor and Director of FIRI open the Seminar



JICA' short-term Expert and FIRI's researcher are giving a lecture on Seminar



FIRI Leader and Chief Advisor open the training course for SMEs



FIRI's Researcher lecture on analytical techniques for SMEs's participants



FIRI's Researcher and Participants discuss analytical results



Participants receive the Certificate from JICA' Experts

Thank you for your attention!

Result of Activities 4

FIRI researchers improve their capability for the technical guidance in the food processing used microorganisms and enzymes and in foods analysis to small and medium scale food processing processing firms

4.1. The number of manuals for technical guidance of microorganisms and enzymes for SMEs are 25

- Strain Group: 8
- Rice spirit Group: 4
- Fruit Wine Group: 3
- CD Group: 5
- LAB Group: 5

4.2. The number of manuals for technical guidance of the food analysis for SMEs are 17

- Simple Analysis: 10 manuals
- Sensory Evaluation: 7 manuals

4.3. The number of Seminars and Workshops organized for SMEs are 17 (target: 16)

- Number of Companies: 175
- Number of participants: 795

4.4. The number of on the job training (consulting) organized for SMEs are 11 (target:20)

| No | Date | Title | Venue | No of part. |
|----|----------------------|---|---|-------------|
| 1 | 15 Feb. – 15 Apr. 06 | Red rice wine technology | Hai Long Co. Ltd., Hai Phong City | 8 |
| 2 | 15-19 May 06 | Set up and control Sensory Evaluation laboratory in Beer Company | Saigon – Phu Yen Beer, Tuy Hoa City, Phu Yen Province | 15 |
| 3 | 8 Sep. 06 | Simple analysis for microbiology | My Thai Co. Ltd. Hai Duong Province | 4 |
| 4 | 6-7 Nov. 06 | Some technical methods to improve quality and food hygiene and safety of fermented shrimp paste (Tom Chua) production (Linked with UNIDO) | Community center, Quang Xuan Village, Quang Binh Province | 29 |
| 5 | 28 Nov. 06 | Nem Chua technology to improve quality and hygiene for Nem Chua farmers (Linked with JOCV) | Community Center, Tao Xuen Town, Thanh Hoa Province | 30 |

| No | Date | Title | Venue | No of participants |
|----|------------------|--|--|--------------------|
| 6 | 21-24 Jan. 07 | Technology of utilization of wine yeast strain having stable aroma production | Hoang Giang Co. Company | 2 |
| 7 | 19-20 Mar. 07 | Improvement of manufacturing technology of rice spirit (Linked with UNIDO) | 3 Rice companies in Quang Binh and Ha Tinh Provinces | 3 |
| 8 | 16, 19 Apr. 07 | Improvement of manufacturing technology of rice spirit (Koji etc) | Uc Company | 4 |
| 9 | 17 Mar. 4 May 07 | Improvement of Lychee Wine. Analyzing methods of Lychee Wine and application of Lychee Wine (Brandy) | Kim Bien Cooperative | 3 |
| 10 | May 07 (sched) | Some technical methods to improve quality and food hygiene eggplant pickles production (Linked with UNIDO) | Quang Binh Province | |
| 11 | June 07 (sched) | Some technical methods to improve quality and food hygiene fermented shrimp production (Linked with UNIDO) | Quang Binh Province | |

*Thank you very much
for your attention!*