HORTIN II Co Innovation Programme

Towards cost effective, high quality value chains

Extending shelf life and freshness of rambutan with modified atmosphere packaging and antifogging LDPE – Supermarket Trial and Workshop Report

HORTIN-II Mission Report nr. 35

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Wageningen, The Netherlands, Jakarta / Bogor, Indonesia, April 2010
The purpose of the HORTIN-II programme is to contribute to the development of cost effective high quality value chains for vegetables and fruits. Among others this can be achieved when technology development takes place in close collaboration between public institutions, farmers and private companies.

On the Indonesian side the programme is carried out by the Indonesian Centre for Horticultural Research and Development (ICHORD), Jakarta, with the Indonesian Vegetable Research Institute (IVEGRI), Lembang, and the Indonesian Centre for Agricultural Postharvest Research and Development (ICAPRD) in Bogor.

In the Netherlands the Agricultural Economics Research Institute (AEI), Den Haag, Wageningen UR Food & Biobased Research (FBR), Wageningen, Applied Plant Research (APR), Lelystad, and WUR-Greenhouse Horticulture (WUR-GH), Bleiswijk, all partners in Wageningen University and Research centre, are involved in the programme.

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CONTENTS

Executive summary ...........................................................................................................7

1. Introduction ..................................................................................................................9
   1.1. Background ...............................................................................................................9
   1.2. Objective supermarket trial ....................................................................................9
   1.3. Objective workshop .................................................................................................9

2. Results supermarket trial .............................................................................................11
   2.1. Methodology ............................................................................................................11
   2.2. MAP film description ..............................................................................................11
   2.3. Participant ................................................................................................................11
   2.4. Product ...................................................................................................................11
   2.5. Location ..................................................................................................................11
   2.6. Time .........................................................................................................................12
   2.7. Process ....................................................................................................................12
   2.8. Recommendations ..................................................................................................12

3. Workshop ......................................................................................................................13
   3.1. Participants ...............................................................................................................13
   3.2. Programme ...............................................................................................................13
   3.3. Conclusions ............................................................................................................14
   3.4. Recommendations ................................................................................................14

Annex I. Observation ........................................................................................................17
Annex II. Observation time ...............................................................................................19
Annex III. Questionnaire ..................................................................................................21
Annex IV. Pictures ..........................................................................................................23
Annex V. Invitation list by Horti Chain Centre ...............................................................27
Annex VI. Photos workshop ............................................................................................29
Executive summary

In strengthening Fruit Supply Chains in Indonesia, taking place in Bogor on 20th – 21st April 2010, Indonesian Center for Agricultural Postharvest Research and Development cooperated with Wageningen University and Research Center, supported by Horti Chain Centre has conducted a workshop of rambutan (Nephelium lappaceum) postharvest technology for accelerating its local and export marketing, attended by more than 100 participants representing Government, Research Institution, University, Farmer, Business Association, Chamber of Commerce, Retail, Fruit and Vegetable Exporter, Logistics Provider, Media, and Packaging Manufacturer. Research results were presented with main purpose to disseminate result of the research in extending the shelf life and freshness of rambutan with Modified Atmosphere Packaging and Antifogging LDPE.
1. Introduction

1.1. Background

Horticultural Research Cooperation between Indonesia and The Netherlands (HORTIN) II Program focus on supply chain innovation of horticultural products, fruits and vegetables. Indonesia is rich of tropical fruits resources, whose potency to earn high economical value. One of these tropical fruits is rambutan (Nephelium lappaceum). Comparatively, rambutan potency is quite big with production in year 2007 reached 705,823 tons within area of 86,741 ha. However, only around 396,093 kgs that was exported due to its low competitiveness and lack of knowledge faced by the players regarding the export potency and opportunity, and the low support showed by government policy.

The main problem in developing rambutan is in its low quality. The quality is not stable and easy to get damaged, while the good and proper handling and processing technology is not yet well known or used, especially technologies to lengthen storage period and prevent damage, also technologies in processing rambutan in form of juice, concentrate, canned rambutan, etc. By using the proper processing and handling technologies, it is expected that rambutan can compete within domestic and export markets, to bring wealth to farmers and other rambutan business players as consequence.

To examine the advantages of this technology at real market condition, private sectors such as Indonesian Fruits Exporter, Importer from the Netherlands, Modern Market (Super Market) have participated in this research. To get access to the private sector, both parties, FBR and ICAPRD called on the assistance of Horti Chain Centre (HCC) to arrange research collaboration based on each role and responsibility.

To disseminate the results of processing and handling technologies of rambutan, the Indonesian Center of Agricultural Postharvest Research and Development, cooperated with Wageningen University and Research Center The Netherlands conducted Workshop, titled “Workshop on Postharvest Technology Application to Stimulate Domestics and Export Markets”. To spread the results of applied research on extending self life of fresh Rambutan during transporting for export and display in modern retail shelf using LDPE with micro perforation and antifogging that involve private sector,, Horti Chain Centre was assigned by both parties mentioned above to invite private sectors such as Modern Retail, Business Association, Chamber of Commerce, Fruit and Vegetable Exporter, Logistics Provider, Media, and Packaging Manufacturer to be involved in the workshop.

1.2. Objective supermarket trial

The objectives of this trial are:
1. To identify retail (supermarket) customer preference to fresh rambutan packed with MAP film comparing with conventional packaging.
2. To identify retail management response to MAP film technology.
3. To try rambutan with MAP film packaging in real condition of supermarket.

1.3. Objective workshop

The objectives of this workshop are:
1. To explore the potency and opportunity if rambutan in domestic and export markets.
2. To disseminate processing and handling technology of rambutan as result of the research from Indonesian Center of Agricultural Postharvest Research and Development, cooperated with Wageningen University and Research Center The Netherlands.
3. To initiate partnership and cooperation in agribusiness.
4. To gain feedback from this cooperation in research and development of rambutan.
2. Results supermarket trial

2.1. Methodology

In this trial, two types of packaging (MAP with antifogging LDPE and Net Packaging) and two varieties of Rambutan (Lebak Bulus and Rapiah) are used. Each variety is packed into 0.5 kg/pack using MAP+Antifogging technology and Net Packaging. All of pack display in the Super Market in Jakarta under room temperature condition. To get feedback from buyer, questioner form is spread out to the visitor of super market. Observation to the rambutan’s appearance during trial is carried out at first day, fourth day and seventh day by taking picture.

2.2. MAP film description

The MAP film description as follow:
- Film is made from LDPE (thickness of 0.04 mm) with some laser perforation and antifog layer.
- Its function is to create modified atmosphere inside the packaging.

2.3. Participant

This trial is conducted by:
- As Research Institute: Balai Besar Pasca Panen Bogor and Wageningen UR Food & Biobased Research The Netherlands.
- As Retail/Super market: Matahari Group
- Facilitator: Horti Chain Centre

2.4. Product

The varieties that are being displayed are: Lebak Bulus & Rapiah with quantity totally of 100 kg/outlet with details as follow:
- 25 kg Lebak Bulus with MAP Film (gross weight, including the film weight)
- 25 kg Lebak Bulus with net (gross weight, including the net & twig weight)
- 25 kg Rapiah with MAP Film (gross weight, including the film weight)
- 25 kg Rapiah with net (gross weight, including the net & twig weight)

The price is the same as the current's supplier price and is decided by Matahari. There is one package of each variety that isn’t sold, as a comparation control. The sticker attached on the MAP Film packaging is prepared by Balai Besar Pasca Panen.

2.5. Location

The location is chosen in Jakarta due to assumption consideration that Jakarta residents usually shops more often at the supermarket (and not to traditional market) comparing to Bogor residents. There are 3 outlets available for this experiments, they are: 2 outlets whose high end segment (Food Mart) and 1 outlet whose medium-low segment (Hypermart).

For Food Mart, the locations are:
For Hypermart, the locations are:

2.6. Time

The experiment is conducted from Thursday 18th February until Wednesday 24th February 2010. Rambutan is distributed to outlets between 10.00 – 14.00 AM. It is displayed for 5 working days and 2 weekend days. The first day of display is the same day as the Matahari’s current supplier sending their own rambutan.

We allocate our observers based on Matahari customer’s peak-time as follow:
   • For working days: 11.00 – 14.00 AM and 15.00 – 18.00 AM
   • For weekend days: 14.00 – 17.00 AM

2.7. Process

To be able to supply to Matahari, we should be registered as supplier. As the experiment is short-term one, we use their current supplier registration (UD Berkah Jaya). During the experiment, questionnaires are distributed to the customers. The observer is 1 -2 students (from IPB) with working time is 3 hours/day. Observation / photos taken are conducted on Day 1, 4, and 7. These students are equipped with an Assignment Letter, agreed by Matahari management. The observer briefing is conducted by HCC on Wednesday 17th February 2010.

2.8. Recommendations

There are some recommendation suggestion arose from the trial as follow:
   • Usually research is only conducted in short term, not continued with applicable result. It is hoped that this research could be applied in real business. The customers already saw and bought it, and if there is future demand from them to buy the same package (with MAP Film), the supplier can provide it.
   • Retail is interested in possibility of trying it with fresh vegetables product, which is expected to be kept fresh within 7-8 days.
   • In the future we should pay more attention to the quality of the rambutan itself. By packing the fresher rambutan, it’s hoped that it can be sold easily, too. So it can reduce the cost of research.
   • There should be more information on the packaging such as harvested form selected fruit, pre wash etc.
   • The temperature at the shelf is +/- 27-28 degree in Celcius so it is not suitable for map film packaging, while the temperature should be 10-12 degree in Celcius. Rapiah is more suitable with map comparing to Lebak Bulus.
3. Workshop

3.1. Participants

The participants were coming from various backgrounds as follow:

- Indonesian Ministry of Agriculture
- Indonesian Agency for Agricultural Research and Development
- Indonesian Center of Agricultural Postharvest Research and Development
- PT Matahari Putra Prima, Tbk (Retail)
- CV Sumber Buah (Fruit Exporter)
- Study Centre of Tropical Fruit Institut Pertanian Bogor
- Indonesian Tropical Fruit Research Institute
- Assessment Institute Agricultural Technology of Subang, Ciamis, Banjar (West Java), Bogor, Tangerang, Lebak, Semarang, Biltar, Banjar (South Kalimantan), Langkat, Sambas, Batanghari
- Indonesian Small Business Exporters Consortium
- Indonesian Vegetable and Fruit Exporter Association
- Indonesian Fresh Fruit and Vegetable Exporter and Importer Association
- Indonesian Cold Chain Association
- Indonesian Netherlands Chamber of Commerce
- PT Agung Mustika Selaras (Fruit Exporter)
- CV Surya Alam Sejahtera (Fruit Exporter)
- CV Arsam Pratama (Fruit Exporter)
- Bina Usaha Al Ikhsan (Farmer Cooperative)
- PT Hokomega Transportama (Logistics/Freight Forwarder)
- AGRINA (Biweekly Agribusiness Tabloid)
- PT Century Mitra Sukses Sejati (Packaging Manufacturer)
- PT Poros Nusantara Utama (Exporter)
- PT Mulia Raya (Fruit Trader)

Participants that coming from private sector were invited by Horti Chain Centre as requested by Indonesian Center of Agricultural Postharvest Research and Development

3.2. Programme

The 1st Day
Venue: Auditorium of Indonesian Center of Agricultural Postharvest Research and Development, Bogor.
Time: 08.00 – 17.00 AM
Participant: All
Activity: Paper presentation, Discussion

Paper presented:

- Policy Direction and Development Program of Rambutan (Directorate of Horticulture, Ministry of Agriculture)
- Potency of Resource and Research Development of Rambutan (Study Centre of Tropical Fruit Institut Pertanian Bogor)
- Market Opportunity of Rambutan in Europe and Potential New Processing Technology for Rambutan (Wageningen University and Research Center The Netherlands)
- Domestic Market Opportunity of Rambutan at Supermarket Segmen (PT Matahari Putra Prima, Tbk)
- Application of MAP and CA Technology for Rambutan (Wageningen University and Research Center The Netherlands)
- Handling and Processing Technologies and Market Trial of Rambutan at Supermarket (Indonesian Center of Agricultural Postharvest Research and Development)
• Good Agricultural Practices Application to produce Fruit with Export Quality (Indonesian Tropical Fruit Research Institute)
• Rambutan Flower Stimulation Technical (Study Centre of Tropical Fruit Institutt Pertanian Bogor)
• Prospect and Experience in Exporting Rambutan (CV Sumber Buah)
• Fresh Rambutan Handling Technology (Indonesian Center of Agricultural Postharvest Research and Development)

The 2nd Day
Venue: Hall of Indonesian Center of Agricultural Postharvest Research and Development, Bogor.
Time: 08.00 – 13.00 AM
Participant: Farmer, Researcher, Fruit Exporter, Facilitator
Activity: Paper presentation, Fruit processing demonstration, Discussion

Paper presented:
• Rambutan Juice Processing Technology (Indonesian Center of Agricultural Postharvest Research and Development)
• Rambutan Processing Technology / in Heavy Syrup (Indonesian Center of Agricultural Postharvest Research and Development)

3.3. Conclusions

The workshop has been successfully attended by more than 100 participants representing relevant stakeholders in rambutan marketing: Government, Research Institution, University, Farmer, Business Association, Chamber of Commerce, Retail, Fruit and Vegetable Exporter, Logistics Provider, Media, and Packaging Manufacturer. They are very much interested in having the MAP film available, so that they can use is for their export/trading activities. A request from retail regarding this film utilization possibility for vegetables was also identified.

Our team also conclude:
1. Indeed the continuous availability of relatively cheap and high quality plastic films in Indonesia is crucial. Apart from Peak Fresh (Australia) Stepac from Israel and Amcor (France) are potential suppliers. Most films can also be used for topsealing which is another promising development.
2. It seems to us that cold chain management is the key for improving quality and extending shelf life of rambutan. MAP plastic films are developed for optimal results with a constant temperature regime of 10°C (as an example). Fluctuating temperature conditions or a constant too high temperature are detrimental for the rambutan quality, regardless MAP packaging. MAP films can never compensate for lack of pre cooling and poor cold chain management.
3. MAP packaging for export markets. Best results were obtained with the MAP bag in a box and repacking in the Netherlands after arrival. This is however a sub optimal and expensive solution and is only compensating – according to us - for poor cold chain management during the export process. In this experiment 500 gram pre packed Rambutan in MAP bags was sub optimal in terms of quality but this was likely to be caused by the fluctuating temperature conditions in the supply chain.
4. Obviously sea transport of rambutan is not an option, because none of the treatments (CA nor MAP) results in longer shelf life than 14 – 18 days (depending on the variety).
5. The so called sea-air bridge is also no option because the distance from Jakarta to Dubai by sea transport is too distant.

3.4. Recommendations

We suggest;
1. We consider that instead of focussing on the optimization of MAP plastic films only we should simultaneously focus on cold chain management. Once Indonesian traders and exporters control the conditions during transport we could combine this with the best MAP option. We can try export / trade
Indonesian rambutan with the Thai way, by doing a cold chain audit first and decide whether to use pre cooling facilities close to the farms; whether to use foam boxes and dry ice or gel packs; whether to use insulating blankets; cooling facilities at the airport etc and combine these measures with the application of MAP films. The Thai are quite successful in keeping their products (such as asparagus, baby corn and fruits) cool all the way to the UK or Australia. Their methods are well documented and HCC could support this.

2. MAP films for domestic markets. To date there are no benefits using MAP film for the domestic market in Indonesia when rambutan is of poor quality and not pre cooled and kept under cold transport conditions. This was illustrated in the Matahari experiment. In the same experiment it was also learnt that MAP packed rambutan should be displayed under chilled conditions for optimum performance and extended shelf life. Apart from the (non) availability of plastic film is a major problem the discontinual supply of high quality rambutan to the supermarket.

3. MAP packaging for other vegetables in Indonesia. When films are available in the market in Indonesia it can be calculated which product should be packed in which film. The OTR of most products at a particular temperature is known and can be found on the internet. Some verification experiments can be conducted to fine tune the technology for Indonesian products and circumstances. However the key for a solution is good cold chain management and how to avoid temperature fluctuations. Only then it can be beneficial to deploy MA films and CA technology.
Annex I. Observation

CIBUBUR JUNCTION

Day 1: Thursday 18th Feb 2010
Rambutan appearance is not so fresh, already with the fog. The temperature inside the retail is quite warm. The package is priced per 1 kg/package, while the actual weight/package is around 600 gr (MAP) and 750 gr (conventional).

Day 3: Saturday 20th Feb 2010
Rambutan is replaced by Lebak Bulus only, with the fresher ones.

Day 4: Sunday 21st Feb 2010
Consumers have impression that packaging of Rambutan in conventional way (including leaves) looks fresh because the leaves are still exist. Other customers assume that Rambutan in plastic bag is ready to eat because it has been washed and never touched by other visitors.

Day 7: Wednesday 24th Feb 2010
The condition of fruits is very bad, both in the map and net. In the map packaging, the fruit becomes juicy while in the net packaging the fruit becomes too dry already.

CILANDAK TOWN SQUARE

Day 1: Thursday 18th Feb 2010
Rambutan appearance is not so fresh, already with the fog. It arrives late (around 16.30 AM). The package is priced correctly or per actual weight as Matahari regulation. We get the best display-location. It’s in the front and together with import and hot item-fruits. Other fresh rambutan from other Matahari supplier that came also that morning looks fresher than ours and customers prefer to buy it instead.

Day 3: Saturday 20th Feb 2010
Rambutan that is being replaced only Lebak Bulus.

Day 7: Wednesday 24th Feb 2010
Only Rapiah in MAP left at display. Condition: varies, some still can be eaten, some in bad condition already. Likely all will be taken out that day by Matahari.

ATRIUM PLAZA SENEN

Day 1: Thursday 18th Feb 2010
Rambutan appearance is not so fresh, already with the fog. It arrives late (around 16.30 AM). The package is priced correctly or per actual weight as Matahari regulation. Other fresh rambutan from other Matahari supplier that came also that morning looks fresher than ours and customers prefer to buy it instead.

Day 3: Saturday 20th Feb 2010
Rambutan is not replaced at all, because there were many packages that are already sold.

Day 4: Sunday 21st Feb 2010
Rambutan is already in a very bad condition, dry, and gathered by flies. Balai Besar Pasca Panen confirms that they will not send any more replacements, so by that day the experiment at that location is finished.
Annex II. Observation time

Table 1. Oxygen and carbon dioxide concentrations applied to the 3 varieties of rambutans during the control atmosphere experiment (at 10°C)

<table>
<thead>
<tr>
<th>No.</th>
<th>Day</th>
<th>Date</th>
<th>Cibubur junction</th>
<th>Cilandak Town Square</th>
<th>Atrium Plaza Senen</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Thursday</td>
<td>18-02-2010</td>
<td>11:00 – 14:00</td>
<td>11:00 – 14:00</td>
<td>15:00 – 18:00</td>
</tr>
<tr>
<td>2</td>
<td>Friday</td>
<td>19-02-2010</td>
<td>15:00 – 18:00</td>
<td>15:00 – 18:00</td>
<td>15:00 – 18:00</td>
</tr>
<tr>
<td>3</td>
<td>Saturday</td>
<td>20-02-2010</td>
<td>14:00 – 17:00</td>
<td>14:00 – 17:00</td>
<td>14:00 – 17:00</td>
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<td>4</td>
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<td>14:00 – 17:00</td>
<td>14:00 – 17:00</td>
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<td>11:00 – 14:00</td>
<td>11:00 – 14:00</td>
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<td>15:00 – 18:00</td>
<td>15:00 – 18:00</td>
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<td>24-02-2010</td>
<td>15:00 – 18:00</td>
<td>15:00 – 18:00</td>
<td>11:00 – 14:00</td>
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Annex III. Questionaire

Isian Petugas
Tanggal :
Nama Petugas :
Rambutan yang dibeli : a. Rapiah = kg b. Lebak Bulus = kg
Jenis kelamin : a. Pria b. Wanita

Isian Konsumen
Umur:
   a. < 19 tahun   b. 19 – 39 tahun   c. > 39 tahun
Pendidikan:
   a. SD        b. SMP        c. SMU        d. Sarjana e. Lainnya .......
Aktivitas:
Pengeluaran per bulan:
   a. < 1 juta b. 1-3 jt c. > 3 jt
Transportasi ke Supermarket:
   a. Umum b. Motor pribadi c. Mobil pribadi
Pertimbangan keputusan pembelian:
Alasan membeli rambutan :
Dalam 1 bulan berapa kali anda membeli rambutan :
   a. 1-2 Kali b. 3-4 Kali c. 5 Kali keatas
Dari mana anda mengenal rambutan dan jenisnya:
   a. Keluarga b. Teman c. media
Kualitas ideal untuk buah rambutan :
Warna Kulit :
Warna Rambut :
Warna Daging
Rasa:
Ukuran kemasan:
   a. seperti sekarang b. Lainnya........................................ (misal: berapa buah per kg)
Parameter yang tidak disukai :
Warna Kulit :
Warna Rambut :
Warna daging :
Rasa:
Ukuran :
Harga ideal buah rambutan:
- a. seperti sekarang
- b. Kemahalan
- c. bisa lebih mahal untuk produk ekslusif

Apakah Anda akan membeli kemasan baru kami dengan kenaikan Rp. 1,000/kg?
- a. Ya
- b. Tidak

Pertimbangan pemilihan kemasan:
- a. Tampilan
- b. Tahan lama
- c. Harga
- d. Isi sesuai kebutuhan (sebutkan).............. kg

Apakah ada daerah pilihan untuk rambutan: sebutkan....

Bila rambutan diolah apakah anda tertarik membeli :
- a. Ya
- b. Tidak

Jenis olahan apa yang disuka :
- a. Jus
- b. Rambutan kering
- c. Dalam sirop
- d. Beku
- e. Lainnya....

Apakah ada hal menarik / komentar/ perbaikan yang ingin diung
Annex IV. Pictures

Figure 1. Rapiah Variety with net packing (day-1).

Figure 2. Rapiah Variety with MAP and Antifogging LDPE (day-1).

Figure 3. Lebak Bulus Variety with net packing (day-1).
Figure 4. Lebak Bulus Variety with MAP and Antifogging LDPE (day-1).

Figure 5. Lebak Bulus Variety with net packing (day-4).

Figure 6. Lebak Bulus Variety with MAP and Antifogging LDPE (day-4).
Figure 7. Rapiah Variety with net packing (day-4).

Figure 8. Rapiah Variety with MAP and Antifogging LDPE (day-4).

Figure 9. Rapiah Variety with MAP and Antifogging LDPE (day-7).
Figure 10. Lebak Bulus Variety with MAP and Antifogging LDPE (day-7).
### Annex V. Invitation list by Horti Chain Centre

<table>
<thead>
<tr>
<th>NO</th>
<th>GROUP</th>
<th>COMPANY</th>
<th>CONTACT PERSON</th>
<th>POSITION</th>
<th>Fax</th>
<th>Phone</th>
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<tbody>
<tr>
<td>1</td>
<td>Association</td>
<td>Indonesia Small Business Exporters Consortium</td>
<td>Mr. Lily Yuliani MBA</td>
<td>President</td>
<td>021 7541 212</td>
<td>021 754 1221</td>
</tr>
<tr>
<td>2</td>
<td>Association</td>
<td>Indonesia Small Business Exporters Consortium</td>
<td>Mr. Erwin Elias MSc, PhD</td>
<td>Founder</td>
<td>021 7541 222</td>
<td>021 754 1221</td>
</tr>
<tr>
<td>3</td>
<td>Association</td>
<td>AEBBI (Asosiasi Ekspor Sayur dan Buah Indonesia)</td>
<td>Mr. Rachman Ginting</td>
<td>Member, PT Momenta Agrikultura</td>
<td>62 21 7588 1953-4</td>
<td>62 21 7588 1950</td>
</tr>
<tr>
<td>4</td>
<td>Association</td>
<td>AEBBI (Asosiasi Ekspor Sayur dan Buah Indonesia)</td>
<td>Mr. Martinus Dwika Cahyanto</td>
<td>Member, PT Momenta Agrikultura</td>
<td>62 21 7588 1953-4</td>
<td>62 21 7588 1950</td>
</tr>
<tr>
<td>5</td>
<td>Association</td>
<td>ASSIBSINDO (Asosiasi Ekspor Sayur dan Buah Indonesia)</td>
<td>Ms. Penny Fransisca</td>
<td>Representative</td>
<td>62 21 721 1357</td>
<td>62 21 721 1358</td>
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<tr>
<td>6</td>
<td>Association</td>
<td>Aksi Rantai Peningin Indonesia</td>
<td>Mr. Hasanuddin Yusuf</td>
<td>Executive Director</td>
<td>6221-8506705</td>
<td>021 850 6609</td>
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<tr>
<td>7</td>
<td>Association</td>
<td>Aksi Rantai Peningin Indonesia</td>
<td>Mr. Sunanda Kertajaya</td>
<td>Member, PT Royal Sun Fruit</td>
<td>62 260 470 638</td>
<td>62 260 470 638</td>
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<tr>
<td>8</td>
<td>Chamber of Commerce</td>
<td>Horti Chain Centre</td>
<td>Mr. M. Haryadi Setawian</td>
<td>Executive Director</td>
<td>62 21 5290 2178</td>
<td>62 21 5290 2177</td>
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<td>9</td>
<td>Chamber of Commerce</td>
<td>Horti Chain Centre</td>
<td>Mr. Kuswanto Zulkarnain</td>
<td>Applied Technology Manager</td>
<td>62 21 5290 2178</td>
<td>62 21 5290 2177</td>
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<td>10</td>
<td>Chamber of Commerce</td>
<td>Horti Chain Centre</td>
<td>Ms. Rara Dewiayanti</td>
<td>Marketing &amp; Business Development Manager</td>
<td>62 21 5290 2178</td>
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<tr>
<td>11</td>
<td>Exporter</td>
<td>PT. Agung Mustika Selaera</td>
<td>Mr. Budi Wibowo</td>
<td>Operational Manager</td>
<td>021 690 7311</td>
<td>021 690 4140</td>
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<tr>
<td>12</td>
<td>Exporter</td>
<td>CV Surya Alam Sejahtera Indomaret</td>
<td>Mr. Surya Agung, ST</td>
<td>Director</td>
<td>62 274 446 1617</td>
<td>62 274 820 7992</td>
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<td>13</td>
<td>Exporter</td>
<td>CV Arsya Pratama</td>
<td>Mr. Ariw Samsul, S.Sos</td>
<td>Director</td>
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<td>62 274 820 7992</td>
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<td>14</td>
<td>Farmer</td>
<td>Koperasi Bina Usaha Al Ihsan</td>
<td>Mr. Naneq Koswara</td>
<td>Manager</td>
<td>62-251-710-8845/642-799</td>
<td>0817 9036 730</td>
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<td>15</td>
<td>Logistics</td>
<td>PT Holomega Transportma</td>
<td>Mr. Hendra Ue</td>
<td>Sales Executive</td>
<td>021 6530 2848</td>
<td>021 6530 2856</td>
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<td>16</td>
<td>Media</td>
<td>AGRINA Tabloid Agribisnis Dwinggian</td>
<td>Mrs. Brenda Andriania</td>
<td>Manager</td>
<td>021 7883 8584</td>
<td>021 7883 7175</td>
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<td>17</td>
<td>Plastics</td>
<td>PT Century Mitra Sakti Sejati</td>
<td>Mr. Budi Sempurno</td>
<td>General Manager</td>
<td>62 21 596 2299</td>
<td>62 21 596 3399</td>
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<tr>
<td>18</td>
<td>Trader</td>
<td>PT Poros Nusantara Utama</td>
<td>Mrs. Rine Aghasima</td>
<td>Manager</td>
<td>62 251-8590246</td>
<td>021 3593245</td>
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<tr>
<td>19</td>
<td>Trader</td>
<td>Mulia Raya</td>
<td>Mr. Ruffy H.</td>
<td>Form Manager (Local Fruit)</td>
<td>021 619 8316 / 545 5464</td>
<td>021 5436 7571</td>
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<tr>
<td>20</td>
<td>Trader</td>
<td>Mulia Raya</td>
<td>Mrs. Henry</td>
<td>Export Manager</td>
<td>021 619 8316 / 545 5464</td>
<td>021 5436 7571</td>
</tr>
</tbody>
</table>
Annex VI. Photos workshop

L to R:
Moshiara Karjaya (PT Matahari Putra Prima, Tbk),
Susanti (Ministry of Agriculture), Wisnu Broto (IAARD),
Dr. Soebir (Tropical Fruit Research Centre),
Dr. Sri Yuliani (IAARD)

Participants

Example of rambutan product development: in heavy syrup and juice

2nd day of workshop, enthusiastic participants are trained to make rambutan juice and heavy syrup-fruit