

Overview on Tropical Fruit in Japan

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Abstract

Currently varieties of fruits are distributed in Japan. In general Japanese consumers are more and more demanding and having keen eye on quality and safety of products. To meet this demand, Japanese suppliers are pretty much focused on customer satisfaction as well as providing competitive price. Under these circumstances, suppliers need significant effort to attract consumers in Japan by quality assurance and disclosure of the process. When we see Japanese tropical fruit market, it is inevitable to pursue high value, high quality and safe product. On the other hand, consumers pay more money if the products have more values compared to other products. It means suppliers can earn more money if they can supply value-added products. From distribution stand point, Japanese agricultural market has been affected by Japan Agricultural Coop (“JA” network) - national network. Farmers are supported by this organization in terms of distribution, quality management, funding, etc. for their various activities. In order to develop tropical fruit business in this matured market, exporters need to provide quality products with own distribution network. Given the fact that most of Japanese prefer domestic products, exporters may need to add more value on their products to be competitive to Japanese domestic products.

Key words: Clean, Distribution, Food safety, Good Agricultural Practice, High quality, Supply chain, Value-added

Introduction

In the past, mandarin orange was major fruit in Japanese market in 1960’s. After the economical growth, product range was varied and growers were producing more species based on the location. In terms of imported fruits, banana has been major product in Japan. This product used be a premium product, but currently banana is the most popular tropical fruit in Japanese market. In Japan, Okinawa is located in sub-tropical area, therefore, pineapple was produced in 1960’s. However, due to regulation change related to free trade, pineapple supply has been taken over by imported products. At this point in time, Okinawa is famous for domestic mango, papaya and other tropical fruits. Domestic mango is produced in Okinawa and southern part of Kyushu. Those products are high value and high quality. Tropical fruits are currently imported from various countries. For instance, avocado import has been increasing mainly from Mexico. Major location of imported mango is Brazil. In this report, current status of tropical fruits, distribution process, consumers preference, government focus, growers momentum are put together to better understand the market in Japan.

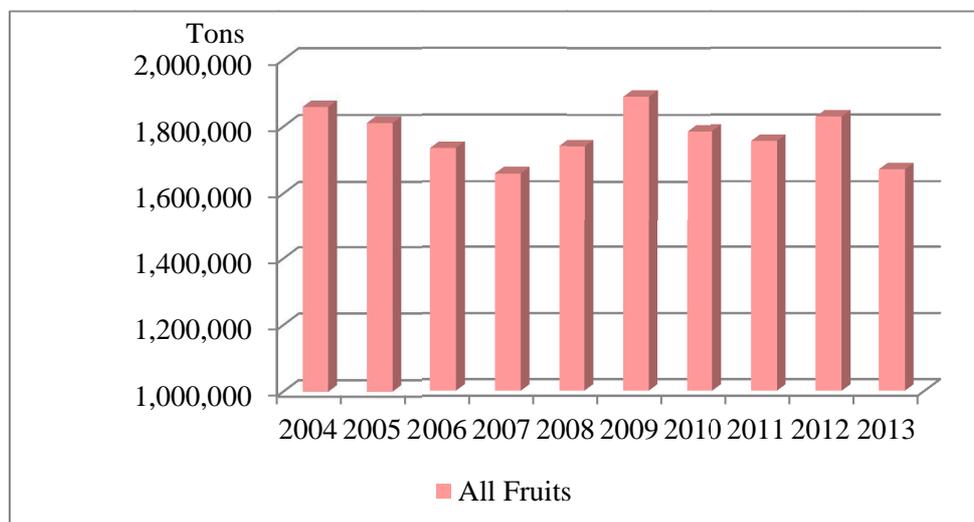
Materials and Methods

This survey was conducted by the research in the market place in Japan, literatures published in Japan and government database. In terms of financial data for imported fruit volume and/or value, the information was extracted from database as well as reports provided by government office and related organizations. With regard to agricultural market conditions, distribution channels etc. were referred to literature published in Japan. In this report, market survey was conducted to provide reality in the market place which will affect consumers' decision making.

1. Annual volume and value of importing fresh tropical fruit from 2008-2013 (or the latest available information)

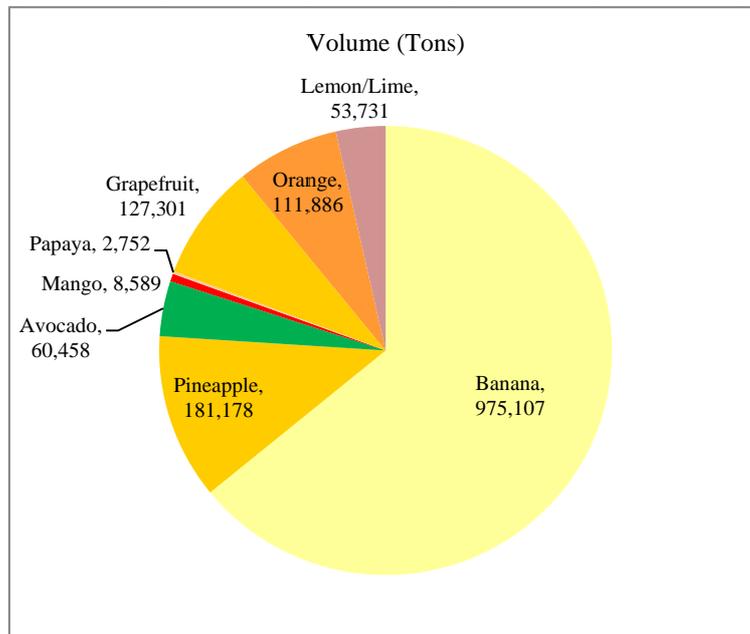
The below is the volume trend of imported fruits since 2004. All fruits imported volume has been fluctuating since 2004. Although current volume is lower level of last 10 years, the volume is still more than 1,600,000 metric tons. It represents significant volume of fruits are imported to Japan.

Fig. 1. All fruits import volume since 2004 in metric tons.



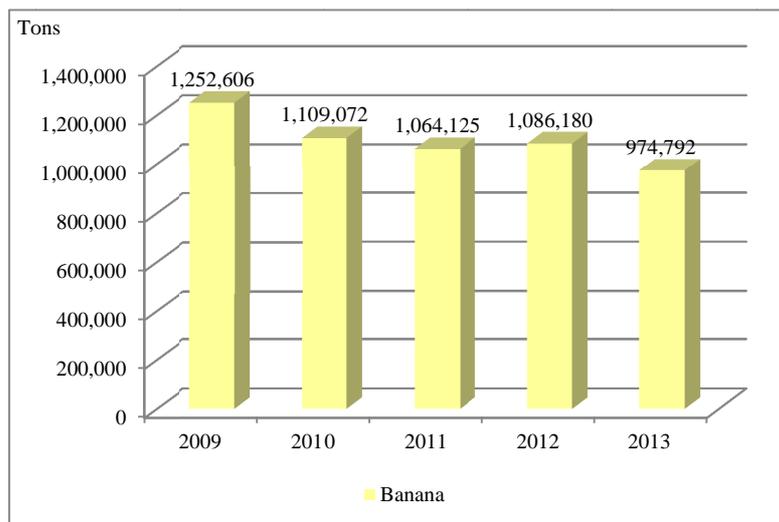
In the category of imported fruits, banana covers significant part of entire volume. If you focus on tropical fruit, banana has a significant part of the volume. This is due primarily to the fact that banana is available through the year, reasonable price, easy to eat, etc. The volume has been declining in recent years, but this is in line with the general trend of all imported fruits in Japan.

Fig. 2. Proportion of major imported fruits in 2013. Banana represents total volume of (1) plantain and (2) bananas (breakdown is shown in section 2.)



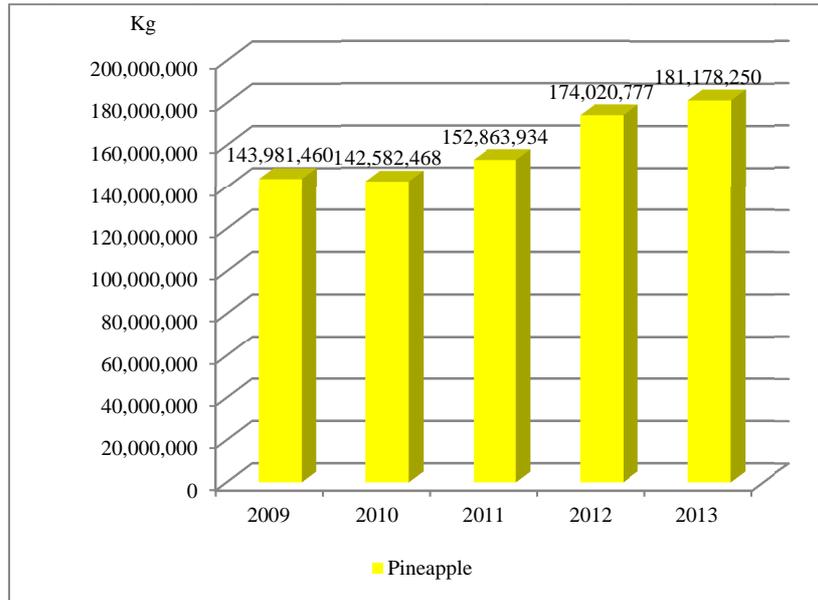
Pineapple is the second largest volume, but it is 19.6% of banana volume. Other major imported fruits are mainly citrus families.

Fig. 3. Import volume of banana since 2009 in metric tons.



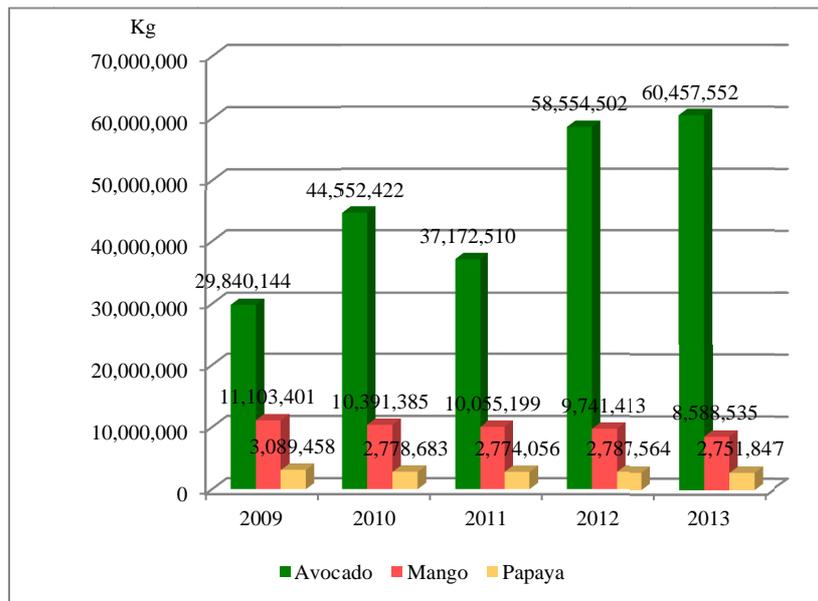
Second major imported tropical fruit is pineapple, although the volume is much lower than banana.

Fig. 4. Import volume of pineapple since 2009 in kg.



The following chart represents three typical tropical fruits in Japan. Avocado is increasing due to the variety of recipe. It appears the volume reduction in 2011 was related to disaster (earthquake).

Fig. 5. Import volume of avocado since 2009 in kg.



2. Major species and varieties, along with their countries of origin, of fresh tropical fruit imported to the country

The following is the imported volume of banana by country of origin. Although the banana is imported from various countries, more than 90% is coming from Philippines. The above chart is the sum of two types of categories – regular banana and banana plantain. The breakdown of the category is shown below.

Table 1. Import volume of bananas by country in kg with proportion in 2013.

(Kg)						
Country of Origin	2009	2010	2011	2012	2013	Proportion ('13)
China	698,541	640,548	709,425	658,678	548,464	0.1%
Taiwan	8,750,745	9,499,714	8,430,440	8,424,944	6,787,279	0.7%
Vietnam	0	0	0	0	34,160	0.0%
Thailand	2,317,358	2,159,848	1,988,736	1,787,872	1,409,861	0.1%
Malaysia	0	0	15,600	18,720	0	0.0%
Philippines	1,159,127,561	1,035,234,339	1,004,098,469	1,026,519,158	908,992,043	93.2%
India	0	0	0	47,840	0	0.0%
USA	18,590	0	0	0	0	0.0%
Mexico	4,809,922	3,730,878	3,062,500	2,930,400	2,991,450	0.3%
Guatemala	0	0	487,200	844,200	4,074,703	0.4%
Dominica	512,465	890,660	218,898	0	0	0.0%
Colombia	4,010,500	3,095,883	2,073,630	2,296,239	2,731,339	0.3%
Ecuador	61,677,375	46,060,256	34,282,390	35,864,015	40,951,302	4.2%
Peru	10,682,746	7,760,058	8,757,597	6,787,651	6,230,103	0.6%
Mozambique	0	0	0	0	41,091	0.0%
Total	1,252,605,803	1,109,072,184	1,064,124,885	1,086,179,717	974,791,795	100.0%

Table 2. Import volume of plantain by country since 2009 with proportion in 2013.

(Kg)						
Country of Origin	2009	2010	2011	2012	2013	Proportion (%)
Taiwan				15,564		0.0%
Philippines				145,367	234,566	74.4%
Ecuador				37,647	80,760	25.6%
Total	0	0	0	198,578	315,326	100.0%

Banana is the most popular imported tropical fruit in Japan. Major variety is cavendish. Banana has been the biggest imported volume in Japan. Major reason is that the product is available through the year, reasonable price, easy to eat, etc. These factors are making banana popular in Japan. At the same time, functionality or nutrition, i.e., “Polyphenol”, etc. is also a driver to generate a big demand. Due to variety of other products, the volume is declined.

Pineapple is a second largest imported fruit in Japan. More than 99% is imported from Philippines and the volume has been increasing (see Table 3). There is a commercial-based domestic production in Okinawa, but the volume is small due to price competitiveness with imported products.

Table 3. Import volume of pineapple by country since 2009 in kg with proportion in 2013.

(Kg)						
Country of Origin	2009	2010	2011	2012	2013	Proportion ('13)
Taiwan	824,405	971,350	865,984	712,760	870,125	0.5%
Thailand	1,600	0	21,429	0	11,811	0.0%
Malaysia	18,000	0	0	18,000	1,250	0.0%
Philippines	143,119,752	141,561,008	151,489,082	172,623,198	180,062,289	99.4%
Sri Lanka	753	0	0	0	0	0.0%
USA	0	33,310	466,439	628,864	48,103	0.0%
Mexico	16,950	0	21,000	0	0	0.0%
Costa Rica	0	0	0	0	85,536	0.0%
Panama	0	16,800	0	37,955	99,136	0.1%
Total	143,981,460	142,582,468	152,863,934	174,020,777	181,178,250	100.0%

After the introduction to Japan, imported volume of avocado has been increasing significantly. It appears the reason is similar to that of banana, which is nutrition. According to the nutrition facts, avocado contains vitamin E. In addition, avocado has a variety of recipe to cook. Therefore, consumers can use this material for daily meals.

From growers stand point, avocado planting is getting popular as the product demand is increasing. Avocado distributed in Japan is mainly imported from Mexico and variety is Haas.

Table 4. Import volume of avocado by country since 2009 in kg with proportion in 2013.

(Kg)						
Country of Origin	2009	2010	2011	2012	2013	Proportion ('13)
USA	0	3,247,576	1,562,299	4,744,232	5,956,780	9.9%
Mexico	26,982,859	40,372,185	32,632,694	52,556,647	52,922,330	87.5%
Chile	1,620,855	386,803	1,033,375	534,912	892,271	1.5%
New Zealand	1,236,430	545,858	1,944,142	718,711	686,171	1.1%
Total	29,840,144	44,552,422	37,172,510	58,554,502	60,457,552	100.0%

In the case of Mango, import volume is not increasing although mango related processed foods are very typical in Japan e.g. sweets such as ice cream, cake, pudding, syrup, etc. (see Table 5)

The origin of the county is mainly Mexico, Philippines and Thailand. From Mexico and Philippines, the variety is Irwin, but on the other hand, Nam Doc Mai and Mahachano are main varieties from Thailand.

In the market place, imported products are sold at relatively cheaper price for daily use. At the same time, domestic products are also commercialized with high value. Due to high quality as well as high value, it appears high-end domestic product is distributed for gift

purposes.

Table 5. Import volume of mango by country since 2009 in kg with proportion in 2013.

(Kg)						
Country of Origin	2009	2010	2011	2012	2013	Proportion ('13)
Taiwan	990,138	995,021	1,154,775	833,907	804,856	9.4%
Thailand	1,406,817	1,519,555	1,514,433	1,773,045	1,309,490	15.2%
Malaysia	0	0	930	0	2,128	0.0%
Philippines	2,720,194	2,834,262	2,197,192	2,112,841	1,733,459	20.2%
India	27,317	9,958	10,771	3,705	0	0.0%
Pakistan	0	0	0	0	1,429	0.0%
USA	285,973	276,935	171,954	178,023	109,362	1.3%
Mexico	5,049,578	3,973,907	3,446,235	3,827,757	3,568,790	41.6%
Dominca	38,497	24,751	12,500	17,671	23,808	0.3%
Puerto Rico	2,990	1,140	0	0	0	0.0%
Columbia	0	0	0	432	0	0.0%
Peru	0	60,357	957,881	339,140	548,617	6.4%
Brazil	394,640	571,464	550,640	598,128	424,245	4.9%
Australia	187,257	124,035	37,888	56,764	62,351	0.7%
Total	11,103,401	10,391,385	10,055,199	9,741,413	8,588,535	100.0%

In Japan, domestic mango has been popular after Miyazaki prefecture developed local brand. The resale price is around JPY 8,000 – 10,000 per piece (approx. USD 80 – 100 at 1USD = 100JPY). The success factor is to promote to Japanese customers by presenting appearance and taste. President of Miyazaki prefecture himself promoted this original brand on TV program and it boosted in the domestic market.

Papaya volume is not so significant. Normally at the supermarket, matured papaya is sold. Okinawa area has variety of recipe for fresh papaya, however, in other areas, fresh papaya recipe is not so popular.

Table 6. Import volume of papaya by country since 2009 in kg with proportion in 2013.

(Kg)						
Country of Origin	2009	2010	2011	2012	2013	Proportion ('13)
Taiwan	9,635	3,874	7,626	1,230	1,200	0.0%
Philippines	2,494,259	2,277,566	2,285,391	2,316,493	2,313,989	84.1%
USA	585,564	497,243	473,939	469,841	436,658	15.9%
New Zealand	0	0	5,980	0	0	0.0%
Fiji	0	0	1,120	0	0	0.0%
Total	3,089,458	2,778,683	2,774,056	2,787,564	2,751,847	100.0%

The following table represents major varieties of banana, avocado and mango observed in Tokyo area. As the direct import volume by trader and/or supermarket is expanded, the varieties are increasing. Therefore, more varieties are introduced to Japanese tropical fruit market.

Table 7. Major species and varieties by county.

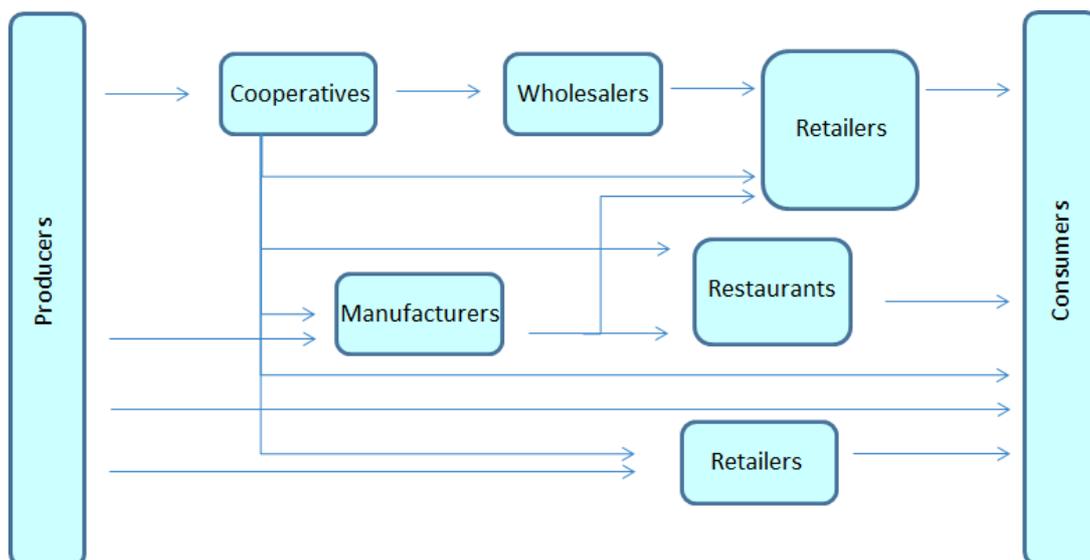
Species	Varieties	Country of origin
Banana	Cabendish	Philippines
Avocado	Haas	Brazil
Mango	Irwin	Brazil
Mango	Nam doc mai	Thailand

For instance, popular mango variety is Irwin due to the fact that this variety fits Japanese preference. However, premium supermarket promotes other varieties imported from Thailand e.g. nam doc mai, mahachano, etc.

3. Distribution channel (e.g. major importing companies, ports of entry, etc.) and market segmentation (e.g. wholesale, retail, etc.) of fresh tropical fruit imported to the country

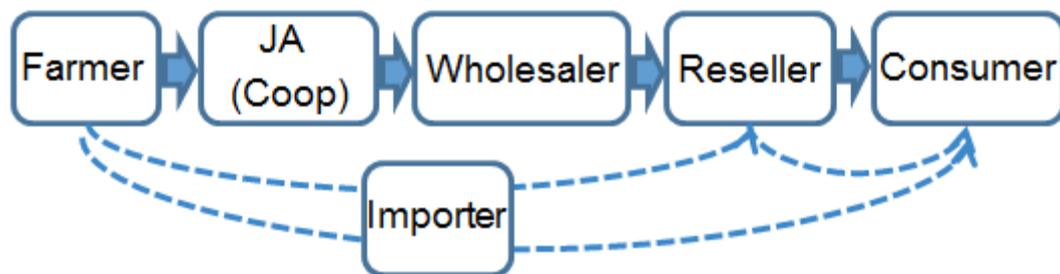
Conventionally distribution channel in Japan primarily consists of JA (Japan Agricultural Cooperatives) with market and direct distribution channels by wholesalers. JA has been providing variety of supports to farmers not only for cultivation but also for financing for daily operations. From farmers perspective, JA has an important values as they are sole purchaser as well as distributor. Additionally, financial support is provided. Therefore, particularly in small-sized farmers still rely on JA system.

Fig. 6. Conventional distribution channel of agricultural products in Japan.



Recently big supermarket is procuring products directly from farmers. The reduction of supply chain process can provide consumers fresh foods. It also guarantees that the products are produced by reliable growers which are visible to consumers. From financial stand point, value chain reduction can generate more profit to supplier.

Fig. 7. Value chain reduction for exporter for Japanese market.



Other distribution channel is local farmers market located in each prefecture in Japan. At this point in time, more than 15,000 markets exist. Major network is a market place network along with national routes, managed by Ministry of Land and Transportation. This network is called by “Michi no eki”. This facility normally has gas station, restaurant, café, gardening shop as well as farmers market, which is sourced from local production area.

In order to develop distribution channel of tropical fruit, original approach for market access is needed other than conventional distribution such as JA (Japan Agricultural Cooperative). Additionally, it is important to establish direct relationship with market or resellers to develop direct distribution channel to earn profit. This approach is able to seek opportunities to develop profitable and sustainable distribution channel.

Currently more and more growers are trying to promote their products via internet shop. Given the fact that more and more consumers search products via internet, the research for e-commerce of tropical fruit is also necessary.

4. Major seasons of the year to import tropical fruit

Tropical fruits are imported to Japan through the year. If we look at the supermarket, we can easily find banana (Philippines), pineapple (Hawaii), avocado (Mexico), mango (Brazil), etc.

The following table represents major seasons for domestic tropical fruits in Okinawa. To export tropical fruits to Japanese market, these seasons needs to be considered to compete domestic products.

Fig. 8. Major seasons for anthesis and fruition in Okinawa, Japan.

Product		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avocado	Anthesis	x	x										x
	Fruition					x	x	x	x				
Mango	Anthesis		x	x	x								
	Fruition						x	x	x				
Pineapple	Anthesis		x	x	x		x	x	x				
	Fruition	x	x	x				x	x	x		x	x
Banana	Anthesis	x	x	x	x	x	x	x	x	x	x	x	x
	Fruition	x	x	x	x	x	x	x	x	x	x	x	x
Papaya	Anthesis												
	Fruition												
Jack fruit	Anthesis	x					x	x				x	x
	Fruition							x	x	x	x	x	
Leici	Anthesis	x	x	x									
	Fruition						x	x					
Wax apple	Anthesis			x	x	x	x						
	Fruition							x					

Shift of planting area to northern part:

At this point in time, domestic producers can supply various tropical fruit which is produced in a warming green house. For instance, Mango is produced even in Hokkaido, which is most northern part in Japan.

Additionally, global warming trend is gradually affecting fruit production in Japan. Planting areas of mandarin orange, apple, cherry, etc. is shifting to northern part of Japan. Major agricultural newspaper introduces farmers' activities for tropical fruits planting in Japan.

5. Phytosanitary requirements or bilateral agreements of specific fresh tropical fruit imported to the country

In terms of phytosanitary requirement, there was an amendment of fumigant usage for imported fruit. Due to revision of Food Sanitation Law in 2003, positive list was developed in 2006 in order to prevent food distribution if the residual value of pesticide is exceeding the criterion. New standard was developed for fumigants such as methyl bromide, hydrocyanic acid and aluminum phosphide.

For the pesticides which were listed in the above initiative, Food Safety Committee

developed Acceptable Daily Intake (ADI) for pesticide according to the investigation by Ministry of Agriculture, Forestry and Fishery (MAFF) as well as evaluation of residual value by Ministry of Health, Labor and Welfare (MHLW). Residue criterion was determined by the ADI.

In 2011, there was an amendment of Phytosanitary Law to be in accordance with international rule. Additionally, positive list was implemented to be able to conduct pest risk analysis. Japan has been participating in the implementation for International Standards for Phytosanitary Measures (ISPM).

In 2013, Ministry of Health, Labor and Welfare (MHLW) announced that investigation should be conducted for specific fruits. Table 8 represents combination of country, target food and investigation item for mandatory investigation.

Table 8. Mandatory investigation item by country, food and pesticide.

Exporting Country	Target Food	Investigation Item
Thailand	Fresh and processed mango	Chlorpyrifos
Thailand	Fresh and processed mango	Propiconazole
Thailand	Fresh and processed banana	Cypermethrin
Thailand	Fresh and processed mangostine	Imazalil
China	Fresh and processed leici	Diflubenzuron
Philippines	Fresh and processed mango	Chlorpyrifos Cypermethrin
Mexico	Fresh and processed avocado	Acephate Methamidophos
Mexico	Fresh and processed guava	Cypermethrin
Mexico	Fresh and processed star fruit	Fludioxonil

With respect to monitoring, frequency is 30% for imported document submissions. In addition, traders who violated the rule need to perform self-investigation. This task continues for one year or up to 60 investigations. Monitoring items are listed in the Table 9.

Table 9. Monitoring items by county, food and pesticide.

Exporting Country	Target Food	Investigation Item
China	Fresh and processed leici	Paclobutrazol
India	Fresh and processed mango	Chlorpyrifos

Spain	Fresh and processed strawberry	Bupirimate
Australia	Fresh and processed orange	Epoxiconazole
Korea	Fresh and processed strawberry	Metconazole
Mexico	Fresh and processed fig	Monocrotophos
Mexico	Fresh and processed passion fruit	Cypermethrin

6. Tariff range for importing fresh tropical fruit (year-round and seasonal)

The following tables show tariff range by major crop. The tariff is varied from crop to crop and country to country as there are special treatments between Japan and exporting countries. The difference of tariff can be an advantage of retail price of imported tropical fruits. The possible impact of specific product can be seen in the price difference section.

Table 10. Tariff range of banana by season.

	Apr – Sep	Oct – Mar
Basic	40%	50%
WTO	20%	25%
Preferential Tariff	10%	20%
Special Treatment	0%	0%

Table 11. Tariff range of banana by season and country..

	Apr – Sep	Oct – Mar
Malaysia	10%	20%
Thailand	10%	18%
Indonesia	10%	20%
ASEAN	14.50%	22.30%
Philippines		
(Qualified / Non-qualified)	4.5% / 8.9%	9.1% / 18.9%

Qualified varieties in Philippines: Inabanico, Latundan, Morado, Pitogo, Saba, Seniorita

Table 12. Tariff range of pineapple by type.

	Fresh	Dried
Basic	20%	12%
WTO	17%	7.2%
Preferential Tariff	-	-

Special Treatment	0%	0%
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Table 13. Tariff range of pineapple by season and country.

	Fresh	Dried
Thailand	0%	0%
Indonesia (Within limited quantity / Other)	0% / 17%	18% / -
ASEAN	17%	6%
Philippines (Within limited quantity)	0%	3.3%
Vietnam	17%	7.2%

Table 14. Tariff range of avocado by category.

Basic	6%
WTO (Fresh / Dried)	3% / 3%
Preferential Tariff	0%
Special Treatment	-

Table 15. Tariff range of avocado by country.

Malaysia	0%
Thailand	0%
Indonesia	0%
ASEAN	0%
Philippines	0%
Vietnam	0%

For other tropical fruit, such as guava, Mango and Mangostine, tariff is the same as avocado. There is no description whether the product is fresh or dried.

7. Consumers' preference on fresh tropical fruit, e.g. appearance, taste, aroma, shape, color, and/or other characteristics

Appearance:

Japanese consumers prefer clean and safe products. Farmers are very sensitive to ship products to the market as the appearance is one of important criteria for food distribution in Japan. If there are some damages, the price is significantly down. In addition, Japanese local fruits are carefully grown and packed to deliver to the consumers.

Taste and aroma:

It appears Japanese find lots of value of fruits on high brix. At the retail shop, high brix is emphasized as this is one of key values of fruit in Japanese market.

Food safety:

Particularly after the disaster in 2011, Japanese consumers are more and more food safety conscious. The criteria are radiation level, treatment by agrochemical and chemical fertilizers, etc. Tracking system and visibility are necessary in order to penetrate into Japanese consumer market.

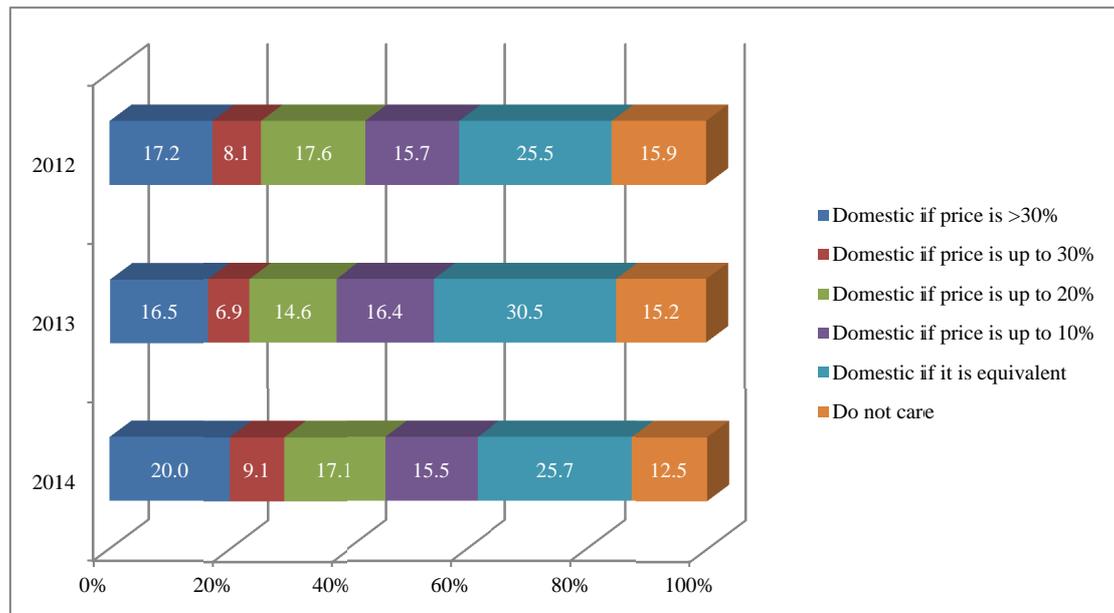
Traceability:

After the disaster happened in March 2011, Japanese consumers are much conscious about radiation effect and source location of the products. To meet those customers focus, food suppliers are conducting investigation of radiation level, disclosing traceability of the products such as producer, location, chemical usage, etc.

Ministry of Agriculture, Forestry and Fishery (MAFF) is recommending risk management for food safety based on scientific approach. They mentioned that ideal steps are collection and analysis of food safety information.

One other thing we need to consider is that many Japanese consumers prefer domestic products. The following data shows the proportion is increasing in the last three years.

Fig. 9. Proportion of preference for domestic product choice in 2013.



Good Agricultural Practice (GAP)

In order to improve food safety, the number of farmers in Japan who adopt GAP is increasing. This certification is to assure that the farm is well managed in terms of cultivation, production and house keeping at the farmer's site. It generated reliability for the goods produced by that farmer and consumers look at this certification as one criterion.

Although global GAP is the most popular, Japanese GAP is being well known by farmers in Japan. According to the report published by Ministry of Agriculture, Forestry and Fishery (MAFF), the number of producers have been adopted GAP. In addition, the report recommended that farmers should adopt GAP in order to pursue food safety.

They mentioned that GAP is pretty important particularly in the production process. They also explained that GAP adoption leads not only food safety but labor safety, competitiveness, quality improvement, management improvement and efficiency. In the case of Japan, GAP certification has been varied from farmers union, local government, distributors and other private groups. Therefore, MAFF implemented a guideline in 2010 to clarify common platform of GAP.

Fig. 10. Number of acquired certification of Japanese GAP since 2007.

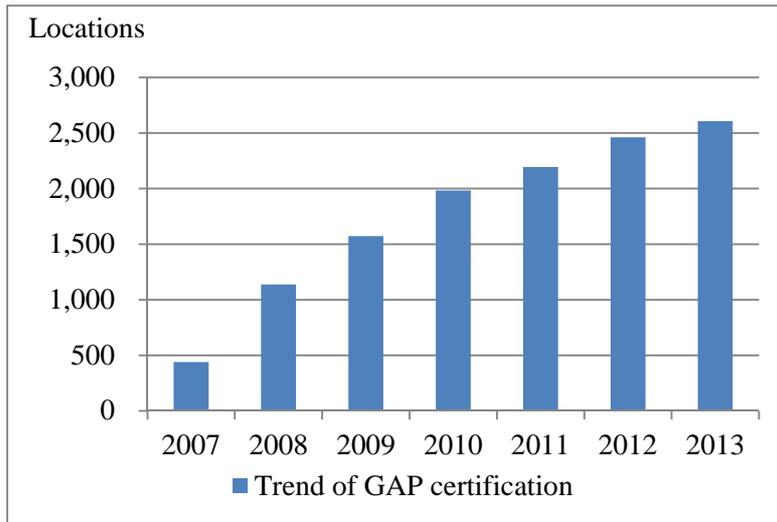
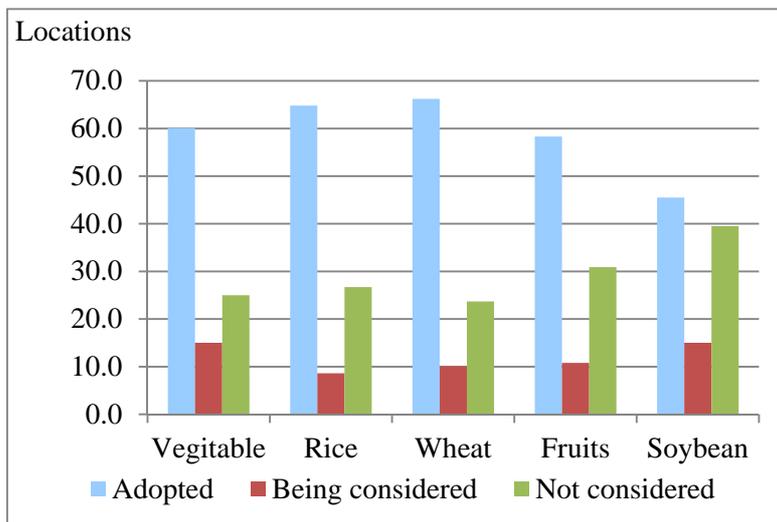


Fig. 11. Farmers status of Japanese GAP certification by category.



This situation means Japanese growers are recognizing that Japanese GAP certification will add more value on their products from distribution perspective. For instance, general merchandising store in Japan is promoting food by disclosing visible information of producers with certification i.e. Organic JAS (Japanese Agricultural Standard).

Given the fact that more than 2500 locations already adopted GAP certification and it has been common process among agriculture in Japan, imported fruits should also have GAP certification in the exporting country.

Fig. 12. Trade mark of Japanese GAP certification.



Food Communication Project (FCP)

Food communication project (FCP) was developed by Ministry of Agriculture, Forestry and Fishery (MAFF) in order to improve reliability of food. The purpose of this project is to visualize the food supply chain and to provide information to consumers related to stakeholder in the supply chain process. As of 2014, 1,632 organizations participated in this initiative.

According to the concept of FCP, food suppliers should comply factory audit process, public relations, etc. to present credibility, which will convince consumers the food is reliable. This initiative has been modified to be in line with global standard of Global Food Safety Initiative (GFSI).

8. Packaging and other usages of imported fresh tropical fruit

Packaging is an important aspect to distribute products in Japanese market. Same as domestic products, fresh fruits are carefully packed and controlled by high level of quality. With respect to packaging, most of consumer products are contained in a clean package. At the same time, source location is indicated. At the premium supermarket in Japan, local fruits and tropical fruits are soled together. In the case of tropical fruits, domestic products are also sold. Suppliers' main locations are in southern part of Japan i.e. Okinawa, Kagoshima, Miyazaki, etc. Imported products are avocado from Mexico, mangostine from Thailand, etc.

Fig. 13. and Fig. 14 represent packaging style of imported tropical fruit at famous premium supermarket (“Seijo Ishii”) located in Tokyo. GMO papaya from Hawaii is packed in a plastic bag by one piece. Mangostine from Thailand is packed with foam bag with five pieces. These appearances show consumers high quality, safe and premium products.

Traditional popular tropical fruits are also sold at high value. Banana from Philippines and Ecuador is packed on a single piece basis or a couple of pieces. Pineapple from Philippines is packed in a plastic bag and advertised as “high brix”.

Fig. 13. Papaya at supermarket Fig. 14. Mangostine at supermarket



Fig. 15. Banana at supermarket



Fig. 16. Pineapple at supermarket



Import volume of avocado from Mexico has been growing. Major variety is Haas and the quality is varied. At the same premium supermarket, avocado is carefully wrapped with foam bag and sold at JPY228 per piece, which is approx. USD2.28 (at 1USD = 100JPY). See Fig. 17.

Fig. 17. Avocado at supermarket



Fig. 18. Non-chemical lemon at supermarket



Other important value to consumer is non-chemical treatment. This case is happened for imported lemon which is sold at high-end supermarket in Tokyo, which is shown in the Fig. 18.

Fig. 19. Mahachano mango at supermarket



Fig. 20. Nam doc mai mango at supermarket



Variety of imported mango has been varied and not only irwin from Brazil but also mahachano (Fig. 19) and nam doc mai (Fig. 20) from Thailand are available at premium supermarket. Suppliers has been trading different varieties of tropical fruit to Japanese market.

If you look at the domestic fruit, high value grape is wrapped with a foam bag and packed in a plastic case with a paper base. Grape is a sensitive product so that high value one is treated with care. Retail price for this product is JPY890 – JPY990 (approx.USD8.90 – USD9.90 at 1USD = 100JPY).

Another case is mandarin orange from Australia. 6 pieces are sold at JPY398 (approx. USD3.98 at 1USD = 100JPY). Product related info rmation is provided on the tag and it says some chemicals are used. This action is one of disclosure of the production processes to consumers.

Fig. 21. Mandarin at supermarket



Fig. 22. Grape at supermarket



Currently durian is also available at the local retail shop in Tokyo. The price of one durian is JPY2,500 (approx. USD25 at 1USD = 100JPY).

At this point in time, trading volume of durian is small, however, as there is a demand in Japanese market, durian can be a competitive tropical fruit product from exporters' stand point. In addition, local production is not so easy even in Okinawa, therefore, there is no

competition with local producers in Japan.

Passion fruit is popular in Okinawa (see Fig. 24) and it is also grown in northern part of Japan in the green house.

Fig. 23. Durian at local market



Fig. 24. Passion fruit at local market



9. Consumer types of tropical fruit in the country, e.g. age, gender, educational level, income group, etc.

There are fruit gift shops in the big cities and major department stores have a premium fruit shop. At those shops, most of the demands are social gift by corporation and/or individual. Due to the nature of customers' purchasing purposes, retail price are high compared to premium supermarket. According to the website of popular fruit gift shop ("Sembikiya"), domestic melon and/or mango are sold at around JPY5,000 - 10,000 (approx. USD50 - USD100 at 1USD = 100JPY).

At the premium supermarket, most of the customers are housewives. It appears the purpose of the purchase is for daily use or special occasions rather than gift. The retail price is lower than that of fruit gift shop, but the price is still higher than that of regular market.

Another research would be needed to investigate educational level of customers, however, it seems the purchasers are educated as they purchase on behalf of large sized enterprise and/or

higher income level consumers.

10. Major factors affecting the popularization of new or exotic fruit

Quality:

Japanese customers are very specific about quality and safety. These factors are much more important than price competitiveness. Ministry of Agriculture, Forestry and Fishery (MAFF) reported initiatives related to food safety and risk management processes.

Disclosure:

At this point, internet usage in Japan is more than 80%. Due to this situation, many consumers can easily search product information and evaluation. In addition, rumors can easily be spread to many people, therefore, suppliers activities are always watched by the consumers.

Ideal approach:

If we look at avocado, Japanese consumers have variety of recipe to enjoy this fruit. It is imported as tropical fruit, currently it is used for cooking. Some Japanese prefers to eat avocado with soy source and “wasabi”, which is traditional spicy paste used for sushi. Given the fact that new recipe has been developed in Japan, tropical fruit suppliers needs to provide how to cook, how to eat, etc. More importantly, suppliers have to sell recipe, not material.

If the product quality meets consumers’ needs, growers and/or suppliers are able to earn more profit. For instance, Mexican avocado is sold at more than US\$2 at premium super market. Japanese consumers are more and more food safety conscious particularly after the disaster in 2011. Tracking system and visibility are necessary in order to penetrate into Japanese consumer market.

This situation would be a burden to exporters to Japanese market, yet high quality and safe products can be accepted at higher value to the demanding consumers, which is positive to growers.

In order to pursue these initiatives, the following aspects will be needed:

1. Quality control by farmers to attract consumers in high value market
2. Post-harvest treatment to maintain good quality while transportation
3. Providing valuable information to consumers

From separate perspective, marketing effort is an important factor to make tropical fruit more

popular in Japan. In addition to functionality and nutrition of tropical fruit, promotional activity is a key to penetrate the product into Japanese market. In order to promote the products efficiently, media strategy needs to be developed such as social network system.

Visibility in production process is also critical to assure quality control. At the same time, traceability is to convince safety-conscious customers.

11. Price difference between imported tropical fruit and domestic substituted fruit

The following table represents a comparison of major tropical fruits available in Japanese market place. In this analysis, quality difference is no considered among domestic products. In the currency conversion, Japanese Yen is converted to USD at 1/100.

Table 14. Price difference between imported tropical fruit and domestic one.

Price Range (per piece)		JPY		USD	
Product	Source	Low	High	Low	High
Acocado	Domestic	150	200	1.50	2.00
	Import	100	230	1.00	2.30
Mango	Domestic	1,000	5,000	10.00	50.00
	Import	500	1,000	5.00	10.00
Pineapple	Domestic	200	300	2.00	3.00
	Import	200	400	2.00	4.00
Papaya	Domestic	350	650	3.50	6.50
	Import	199	890	1.99	8.90
Dragon fruit	Domestic	400	500	4.00	5.00
	Import	298	298	2.98	2.98

Imported products are not necessarily more expensive than domestic products. For instance, avocado is cheaper than domestic product. One factor is zero tariff and this can be an advantage of imported avocado's promotion.

In the case of pineapple, domestic one is sold at JPY300 (approx. USD3 at 1USD = 100JPY) at direct retail shop at Ishigaki island of Okinawa (see Fig. 25). This price is slightly lower than that of Philippines' one sold at premium supermarket in Tokyo. However, domestic product at Ishigaki island is a commodity product compared to the Philippines' high value product.

For instance, papaya (2 pieces package) imported from Philippines is sold at JPY398 (USD3.98) vs. Ishigaki island' (one piece) is at around JPY350-650 (USD3.5 – 6.5 at 1USD

= 100JPY).

Fig. 25. Domestic pineapple at local market



Fig. 26. Domestic mango at premium supermarket



Domestic mango price is still high (e.g. Miyazaki) due primarily to warming cost at green house except Okinawa area. At the premium supermarket, discounted price of domestic mango (variety is Irwin) is JPY1,990 (USD19.9 at 1USD = 100JPY) (see Fig. 26).

Fig. 27. Imported papaya at premium supermarket Fig. 28. Domestic papaya at local market



The following pictures show imported dragon fruit at premium supermarket in Tokyo and domestic one at local market in Okinawa. The retail price of imported one is JPY298 (apprx. USD2.98 at 1USD = 100JPY), which is much lower than that of domestic one. Price of domestic dragon fruit is JPY400-500 (apprx. USD4-5 at 1USD = 100JPY). This is due to production volume of dragon fruit in Japan is small.

Fig. 29. Imported dragon fruit at premium supermarket

Fig. 30. Domestic dragon fruit at local market



12. Annual volume and value of processed tropical fruit produces from 2008-2013

This information is not available at this point. Government primarily provides fresh fruits volume and there is no specific data for processed foods. This area needs to be investigated further.

With respect to retail price of processed food, example of coconut oil is introduced in the section 13.

13. Major processed types of processed tropical fruit produces (e.g., frozen, canned, dried, etc.)

In most cases, imported tropical fruits are canned. Popular product is canned pineapple and it has been distributed in Japan since 1960's to 1970'.

In the case of pineapple, domestic canned pineapple was produced in Okinawa in 1960's. Due to free trade momentum, regulation of frozen pineapple import to Japan in 1970's.

Post-harvest treatment:

When the products are imported to Japan, post-harvest treatment is one of key successful factors. At the same time, Japanese consumers are specific for the chemical treatment, contained chemical level needs to as minimal as possible and it has to be disclosed to make the product reliable.

The other case of processed food is bottled coconut oil. At the supermarket in Tokyo, three types of products are sold – regular coconut oil, organic coconut oil and virgin coconut oil. Retail price is JPY790, JPY 1,600 and JPY1,980.

Fig. 31. Coconut oil (regular & organic)
at supermarket

Fig. 32. Coconut oil (virgin oil)
at supermarket



14. On-going research and development for promoting in-country production of tropical fruit

Firstly, distribution channel for imported products in Japan is a challenging as the conventional fruit distribution is pretty much matured. Although this channel is stable and national network, profitability is low primarily driven by long distribution.

Secondly, the biggest challenge is how to maintain quality of the products. In order to meet demanding customers' needs, quality and freshness are the key factors. It is necessary that the quality management during transportation from source location to imported country. If the products are transported by air, the quality and freshness are maintained as the importation period is short. However, the cost is much higher than that of ocean transportation. On the other hand, transportation by ocean is low cost method, but quality management is more critical than that of air transportation. Given the price of tropical fruit, ocean transportation is an appropriate method for export. Quality management process during ocean transportation needs to be developed.

Thirdly, due to the consumers' conscious about safety, tropical fruit exporter should comply with visible process of production. For instance, GAP concept is more and more popular in agricultural market in Japan. In order to promote tropical fruit in Japanese market, exporters should consider whether this process management is activated.

In addition, export business needs to generate appropriate profits. Therefore, profitable

business model has to be developed. In order to realize this sustainable business, best practice of tropical fruit export to Japanese market. From marketing perspective, branding is pretty important for Japanese consumers. To establish good brand image could be a key for success in Japanese market. Thus branding strategy is also considered in the next step. From growers perspective, global warming is an positive effect that tropical fruit will be a future profitable plat to support farmers. Going forward, the above mentioned areas would be needed to perform research.

Conclusions

Tropical fruit market in Japan:

Demand of fruit market in Japan has been changing over the last 30 years, which is a positive factor to develop imported tropical fruits market. Imported fruits are increasing due to variety of consumers' preference. Due to global warming, planting area of domestic fruits is moving to the northern part in Japan. This trend is supporting to introduce more varieties of tropical fruits in Japan. Japan is expecting market for tropical fruits exporters to Japan if the products can meet consumers' needs in quality, safety and functionality. The challenge in distribution in Japan is to attract consumers from quality perspective. It is true that Japanese consumers are demanding, but on the other hand, there will be more opportunities to introduce high value products to generate profit by suppliers.

Growing market in tropical fruits:

Currently product range is varied and growers are producing more species. Tropical fruits market is also growing in Japan, i.e., avocado, mango, durian, mangosteen, etc.

Conventional long distribution channel:

National distribution channel has been managed by JA in Japanese market. This channel (ZEN NOH: National Federation of Agricultural Cooperative Associations) has a role of stable fruit supply to consumers as well as price control in Japan. However, margin for growers is limited due to marketing and distribution roles handled by ZEN NOH and quality requirements.

Demanding consumers:

Japanese consumers are very specific on quality and safety management. This situation would be a burden to exporters to Japanese market, yet high quality and safe products can be accepted at higher value to the demanding consumers, which is positive to growers.

Good Agricultural Practice (GAP):

Many farmers in Japan are adopting GAP certification. This certification is to assure that the farm is well managed in terms of cultivation, production and safety. It ensures reliability of the goods produced by that farmer.

Own distribution and value-added products:

Successful growers are managing multiple distribution channels such as conventional Coop network and their own distribution channel such as farmers market, internet, etc. In addition, growers are developing original processed foods.

Food Communication Project (FCP):

Food communication project (FCP) is an activity to visualize the food supply chain and to provide information to consumers related to stakeholder in the supply chain process. Government (MAFF) is focused on this project.

Based on the market environment in Japan, the following approaches are recommended.

1. Original distribution:

Conventional fruit distribution is pretty much matured. Although this channel is stable and national network, profitability is low primarily driven by long distribution.

2. Quality & functionality:

If the product quality meets consumers' needs, growers and/or suppliers are able to earn more profit. For instance, Mexican avocado is sold at more than US\$2 at premium super market.

3. Safety & disclosure:

Japanese consumers are more and more food safety conscious particularly after the disaster in 2011. Tracking system and visibility are necessary in order to penetrate into Japanese consumer market.

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About Creative House Corporation:

Creative House Corporation is providing value-added services to consumers and farmers. Major services are e-commerce businesses for tropical fruits and other processed materials to consumers in Japan and information services to growers. E-commerce brand is vegefirst.com. Information services are provided to growers on a cloud-based software application, “Agri Manger”, which enables growers to manage daily cultivation management, supply chain management and profitability management, etc.