COUNTRY OF ORIGIN AND THAI CONSUMER VALUATION OF FRUITS AND VEGETABLES UNDER FREE TRADE AGREEMENT

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A THEMATIC PAPER SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION
(BUSINESS MODELING AND ANALYSIS)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2011

Thematic Paper
entitled

COUNTRY OF ORIGIN AND THAI CONSUMER VALUATION OF FRUITS AND VEGETABLES UNDER FREE TRADE AGREEMENT

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was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Master of Business Administration (Business Modeling and Analysis)
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ACKNOWLEDGEMENTS

I firstly would like to thank my advisor and co-advisor of this paper, Asst. Prof. Dr. Yingyot Chiaravutti and Dr. Nuntana Udomkit for the valuable guidance, advice and time; as well as Asst. Prof. Dr. Piriya Pholphirol, Chair of the committee. Moreover, I also would like to thank K.Sawitree Pitchayachai for the assistances during the experiment. They tremendously contributed sentiment, which helped me to be able to finish this paper completely.

I would like to show my gratitude to all the lecturers of the program who give me the opportunities to learn and Mahidol University International College (MUIC), Sathon campus for providing me with satisfactory facilities and friendly environment to complete this master degree, especially for this project. The program gave me an opportunity to learn about business modeling and analysis. I am also grateful to MUIC officers for all supports, guidance and necessary information through this program and project.

Finally, I would like to thank to my families and friends for supporting through my study, especially on this project. Without supports mentioned above, I would face many obstacles and difficulties to complete this project.

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ABSTRACT

Thailand still imports fruits and vegetables even though the country has an abundant amount of them. There are many factors including price and consumers' preferences that cause this to happen. These imports could affect fruit and vegetable growers in Thailand in the future when imported fruits and vegetables are cheaper.

This paper adopts the experimental method called the '*n*th price auction' in order to elicit the willingness to pay (WTP) of Thai consumers toward fruits and vegetables, which come from different countries. Sixty subjects participated in this experiment. Fruits and vegetables used in this experiment included strawberries, kiwis and carrots which were from China, the United States, New Zealand, Japan, and Thailand. These five countries have a Free Trade Agreement (FTA) with Thailand, except the United States for which this process is under negotiation. FTA would eliminate the trade barrier which would intensify the price competition.

The results showed that WTP of fruits and vegetables grown in Thailand and imported from China are not different. Therefore, Thai fruit and vegetable growers should set a lower price. On the other hand, WTP of fruits and vegetables imported from the United States, New Zealand, and Japan are on the same level.

KEY WORDS: WILLINGNESS TO PAY / FREE TRADE AGREEMENT /
Nth PRICE AUCTION / IMPORTED FRUITS AND VEGETABLES /
COUNTRY OF ORIGIN

47 pages

การประเมินราคาผักและผลไม้ที่นำเข้าผ่านข้อตกลงเขตการค้าเสรีที่มีแหล่งกำเนิดต่างกันในไทย
COUNTRY OF ORIGIN AND THAI CONSUMER VALUATION OF FRUITS AND VEGETABLES UNDER FREE TRADE AGREEMENT

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บทคัดย่อ

ประเทศไทยมีทรัพยากรและความหลากหลายของผักและผลไม้จำนวนมาก อย่างไรก็ตามประเทศไทยยังคงต้องนำเข้าผักและผลไม้จากประเทศต่างๆ เป็นจำนวนมาก เนื่องมาจากราคาและความชอบของผู้บริโภค ซึ่งอาจจะส่งผลกระทบต่อเกษตรกรไทยในระยะยาว การแข่งขันจะมีความรุนแรงขึ้นเนื่องจากราคาผักและผลไม้นำเข้าจะถูกลง

การวิจัยนี้ใช้วิธีการทดลองโดยอาศัยการประมูลแบบ *n*th price auction เพื่อหาความเต็มใจในการจ่ายของผู้บริโภคไทยต่อผักและผลไม้ซึ่งมีที่มาต่างกันโดยมีผู้เข้าร่วมการทดลองทั้งสิ้น 60 คน ผักและผลไม้ที่นำมาทดลอง คือ สตรอเบอรี่ กีวีและแครอท ประเทศที่นำมาเปรียบเทียบ คือ สาธารณรัฐประชาชนจีน สหรัฐอเมริกา นิวซีแลนด์ ญี่ปุ่น และไทย ซึ่งประเทศดังกล่าวได้มีข้อตกลงเขตการค้าเสรีกับประเทศไทย ยกเว้นสหรัฐอเมริกาซึ่งอยู่ในกระบวนการเจรจา การเลือกผักและผลไม้ที่อยู่ในกลุ่มของเขตการค้าเสรีมาทำการทดลองจะทำให้การวิจัยนี้มีความชัดเจนเพิ่มขึ้น เนื่องจากภาษีนำเข้าจะไม่เป็นปัจจัยที่สามารถส่งผลกระทบต่อราคาผักและผลไม้ ผลการทดลองพบว่าผักและผลไม้ที่ผลิตในประเทศไทยได้รับความเต็มใจในการจ่ายไม่แตกต่างจากผักและผลไม้ที่นำเข้าจากสาธารณรัฐประชาชนจีน ดังนั้น เกษตรกรไทยควรตั้งราคาขายสำหรับผักและผลไม้ดังกล่าวให้ถูกลง ในส่วนของผัก ผลไม้ที่นำเข้ามาจากสหรัฐอเมริกา นิวซีแลนด์และญี่ปุ่นนั้นถูกประเมินความเต็มใจในการจ่ายอยู่ในระดับเดียวกัน โดยผลไม้บางชนิด เช่น กีวีซึ่งมีแหล่งกำเนิดจากประเทศนิวซีแลนด์ ไม่พบความแตกต่างจากกีวีที่นำเข้ามาจากสหรัฐอเมริกาและญี่ปุ่นแต่อย่างใด

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CHAPTER I
INTRODUCTION

1.1 Background of the study

Thailand has abundant resources and a wide diversification of tropical and subtropical fruits and vegetables compared to other countries in the world. Thailand has a high yield of fruit production which enables it to export a wide range of products, especially pineapple, mango and durian to many counties as shown by Table 1.1. The value and volume of exports of Thai fruits is rising, and the total trend is increasing every year as shown by Table 1.2. In addition, Thai consumers also have a high consumption of fruits measuring up to 170 grams/person/day (Rungrojcharoenkit & Sukkumnoed, 2008) and vegetables consumed at 103.03 grams/person/day (National Health Foundation, 2009).

Table 1.1: Area of production, total production and export volume of major fruits of Thailand as of 2005

Kinds of fruits	Area of production (ha)	Total production (tons)	Export volume (tons)	Percent export (%)
Longan	153,189	705,534	241,875	34.28%
Durian	131,680	640,242	150,750	23.55%
Mangosteen	66,867	207,309	40,923	19.74%
Lychee	27,769	79,274	24,642	31.08%
Rambutan	84,464	518,616	12,886	2.48%
Mango	316,032	2,080,650	17,158	0.82%
Pummelo	30,736	276,628	6,293	2.27%
Pineapple	95,888	2,189,293	670,679	30.63%
Total	906,626	6,697,546	1,165,206	17.40%

Source: Office of Agricultural Economics: Department of Agriculture, 2006.

Table 1.2: Value* and volume of export of major fruits of Thailand, during the year 2003 to 2005 (Amount unit: tons, Value unit: US Dollars-Million)

Fruits	2003		2004		2005	
	Amount	Value	Amount	Value	Amount	Value
Longan	155,430	135.018	199,070	118.217	241,875	142.638
Durian	107,028	57.621	153,018	64.035	150,750	77.408
Mangosteen	13,264	8.782	27,006	13.206	40,923	20.966
Lychee	18,377	17.373	20,810	16.849	24,642	18.507
Rambutan	17,192	12.307	13,411	11.714	12,886	11.548
Mango	18,315	13.873	16,132	11.238	17,158	13.613
Pummelo	7,607	3.261	7,313	2.915	6,293	2.848
Pineapple	637,599	523.231	624,126	624.136	670,679	550.64
Total	974,812	771.466	1,060,886	862.31	1,165,206	838.168

Source: Office of Agricultural Economics: Department of Agriculture, 2006.

* Note: Thai/US Dollar Exchange rate = 35 baht/USD.

Thailand not only exports its major fruits and vegetables to many countries, but it also imports a variety of foreign agricultural products. This can be seen by reference to Figure 1.1 which shows that the value of import and export of Thailand is a balanced figure the total of which increases annually. Imported fruits to Thailand were mainly from China, the United States and New Zealand as shown by Figure 1.2. Imported vegetables were mainly from China, Taiwan, Indonesia, the United States and New Zealand are shown by Figure 1.3. This market research paper and experiment focuses only on three types of fruits and vegetables, namely, strawberries, kiwis and carrots. These are selected for a market-research of consumer acceptance study based on their popularity and the amount imported. Certain fruits are indigenous and are representative of some specific countries, and this makes this market survey study-paper to be more interesting if we can compare the results of this survey to the results of other countries shown in Figure 1.4, 1.5 and 1.6. For example, the kiwi is a fruit representative of New Zealand, and the analysis is more interesting if we compare the final survey results to other countries. Finally, the countries that are selected to be in the study-paper include China, the United States, New Zealand, Japan and Thailand.

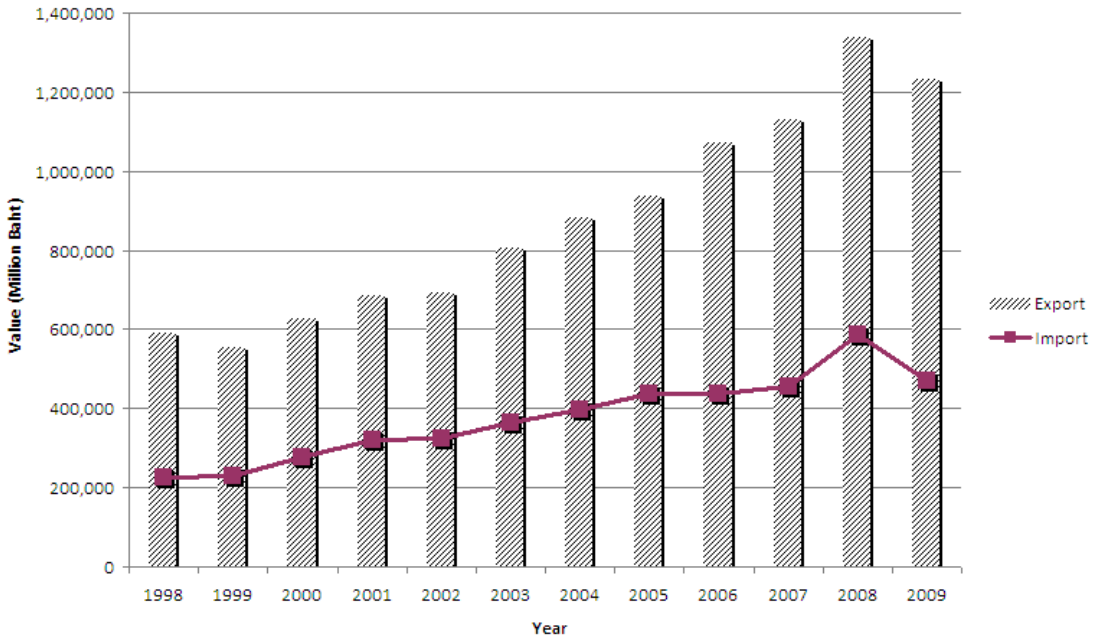

Figure 1.1: Value of Thailand import and export of agricultural products during 1998 to 2009

Source: Office of Agricultural Economics: Department of Agriculture, 2009.

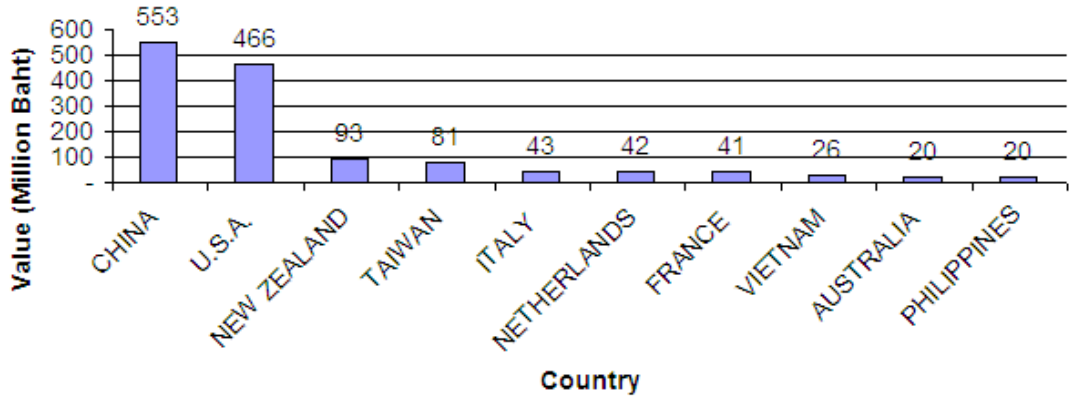

Figure 1.2: Value of Thailand imported fruits in Thailand as of 2010

Source: Office of the Permanent Secretary: Ministry of Commerce (2010)

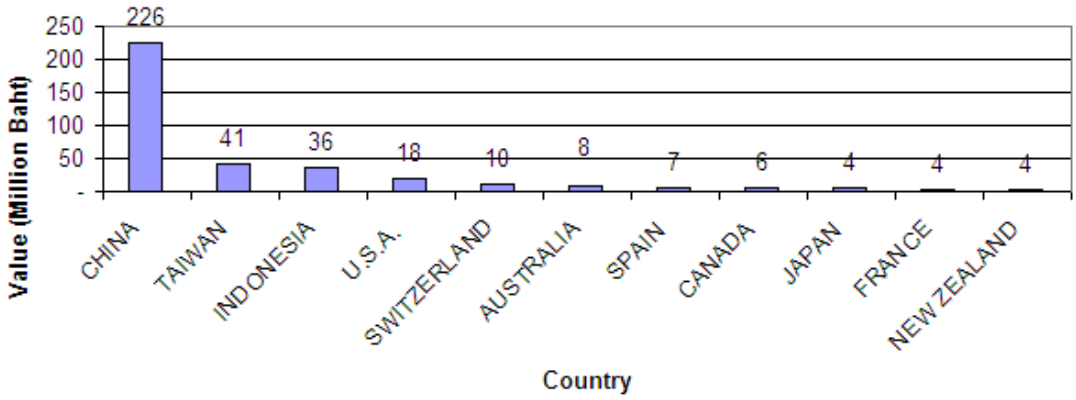

Figure 1.3: Value of imported vegetables in Thailand as of 2010

Source: Office of the Permanent Secretary: Ministry of Commerce (2010)

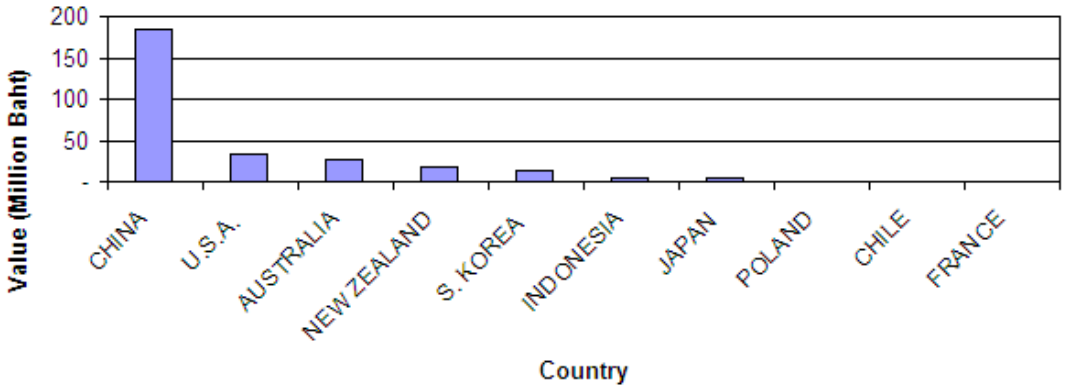

Figure 1.4: Value of imported strawberries in Thailand by country as of 2010

Source: Office of the Permanent Secretary: Ministry of Commerce (2010)

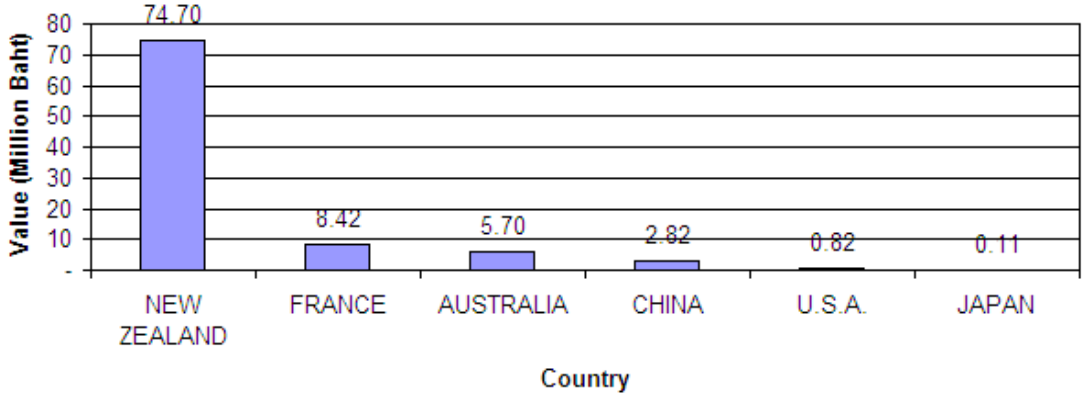

Figure 1.5: Value of imported kiwifruit in Thailand by country as of 2010

Source: Office of the Permanent Secretary: Ministry of Commerce (2010)

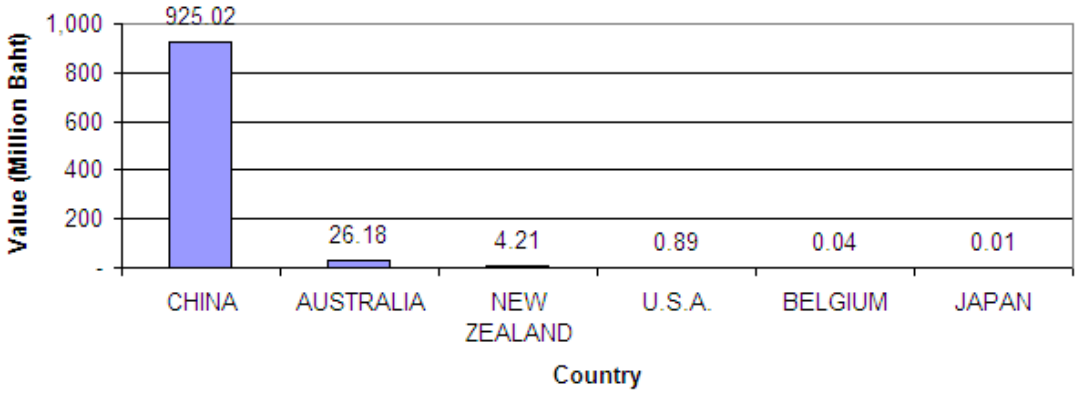

Figure 1.6: Value of imported carrots in Thailand by country as of 2010

Source: Office of the Permanent Secretary: Ministry of Commerce (2010)

1.2 Statement of the Problem

A Free Trade Agreement or FTA between countries can help businesses by providing tariff concessions which include reduction of the imposed tariff for certain imported products. Thailand has FTAs with many countries including Australia, China, India, South Korea, New Zealand, Japan and Peru. All the countries which are selected in this paper including China, Japan and New Zealand have FTAs with Thailand except the United States where the process is under negotiation.

Thailand imports a high volume of fruits and vegetables from China including apples, kiwifruit, pears, garlic and carrots. The import costs of fruit and vegetable products from China are lower than many other countries and this is representative of its competitiveness. The cost advantages originate from many factors including lower worker wage-costs, lower local purchasing costs, lower investment costs and a larger 'home-consumption' scale of their economy. Since the first early development of the Chinese fruit and vegetable industry began, its output has been increasing every year. It is now one of the leading fruit and vegetable producers and the market leader throughout the world. According to the statistical data of The National Bureau, it shows that China's orchard production area was 10,471 thousand hectares in 2007 and had a total fruit production output of approximately 181,363 thousand tons (National Bureau of Statistic of China, 2009). Among that number, the output figures documented including oranges, pears and apples accounted

respectively for 11.35%, 7.11% and 15.25% of the total output of the fruits in China (Bharatbook, 2009). When the supply of the products is in excess of domestic demand, China exports it to other countries including Thailand, with prices being competitive compared to the domestic products produced in those countries.

Before free trade agreements were signed, all industries around the world faced both import and export problems due to the very high and differing tariff rates of different countries. ASEAN and China signed the "Framework Agreement on ASEAN-China Comprehensive Economic Cooperation" on November 4th, 2002 to establish a free trade area of China and Asian countries including Thailand. From January the 1st 2004, the tariff rates on fruits and vegetables were significantly reduced, and those same tariff rates would be eliminated completely to 0% on January 1, 2006 (Department of Trade Negotiation: Ministry of Commercial, 2010). However, due to the fact that China and Thailand have an existing high volume of essential trade in goods under the custom 'product-lines' tariff of fruits and vegetables China and Thailand signed an agreement on an accelerated tariff elimination for all items under some tariff and product categories. This included apples, strawberries, carrots and garlic and became effective on the 1st of October 2003. This led to a 0% tariff rate for those items (Department of Trade Negotiation: Ministry of Commercial, 2008). After signing the agreement in 2003, the value of Thailand imports for fruits and vegetables from China increased rapidly as shown in Figure 1.7.

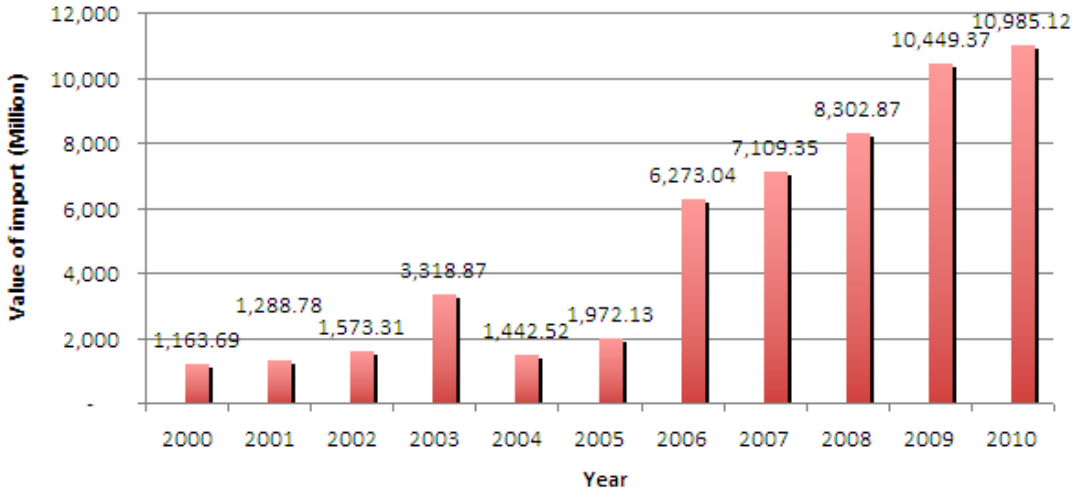

Figure 1.7: Value of imported fruits and vegetables from China since 2000 to 2010
Source: National Food Institute (2010)

A 'Free Trade Agreement' enables Thai consumers to have a wider choice at the 'point-of-sale', of course, some choose to consume imported fruits and vegetables from China taking advantage of its lower price. For example, the FTA between China and Thailand led to the decrease of the production of garlic in Thailand by 22% in three years. Consumption fell from 96,000 tons in 2004 to 75,000 tons in 2007 (Department of Trade Negotiation: Ministry of Commercial, 2008). However, this does not mean that the overall consumption of fruits and vegetables of Thai people has increased because Thai people consumed vegetables at the rate of 103.03 grams/person/day in 2002, but after the FTA it fell to 86.37 grams/person/day in 2005 (National Health Foundation, 2009). This could imply that an FTA does not affect the consumption of vegetables by Thai people by making products available at a lower import price. On the other hand, the consumption of fruits by Thai people is higher since the signing of an FTA, but that specific types of fruits consumed is higher, almost all of which are cheaper products imported from China, including kiwifruit, strawberries, apples and plums. This has increased from 13.36 per year to 569.43 per year during 2002-2005 (National Health Foundation, 2009). This means that specific imported fruits from China have replaced Thai fruits, which has an effect on the viability of Thai fruit growers.

Besides China, Thailand also imports a variety of fruits and vegetables from Japan such as apples, pears, strawberries and carrots. According to the World Health Organization, people who spend their lives in Japan are expected to live longer than people that live in other countries of the world (WHO, 2000). Fruit production in Japan thrives because growth of fruit benefits from an abundant water supply and a relatively mild climate. Fruits grown in temperate climates of Japan such as apples and pears are grown in large volumes and are exported to other countries (Dyck & Kenzo, 2004).

Unlike the FTA agreement with China, Japan and Thailand have made a Japan-Thailand Economic Partnership Agreement or JTEPA which was signed on the 1st of November 2007. (Department of Trade Negotiation: Ministry of Commercial, 2008). Although Thailand opened its markets for fruits and vegetables from Japan, the tariffs set on some categories would reduce, including the tariffs set on rambutan and lychee which was reduced to 0% immediately. During 2011 the tariffs on cherries will

be reduced to 0%. The tariffs on other temperate-weather fruits, including apples and pears will also be reduced to 0%. The tariffs on strawberries and carrots are to be gradually reduced year by year from 40% to 0% in April 2012 (Ministry of Agriculture Co-operative, 2007). It was thought that before the JTEPA agreement, the fruits and vegetables import value might decrease in some years. However, after Japan and Thailand signed the contract for the tariff elimination in 2007, the import value has been growing continuously as shown by Figure 1.8. The main strength of Japan's own fruit and vegetable production are a very high degree of freshness, visual perfection and the quality of the taste. After the FTA, Thai consumers now see more Japanese products which are attractively packaged with labeling that advertises its origin. These high-quality fruit and vegetable products can also demand a higher price-premium at the point-of-sale.

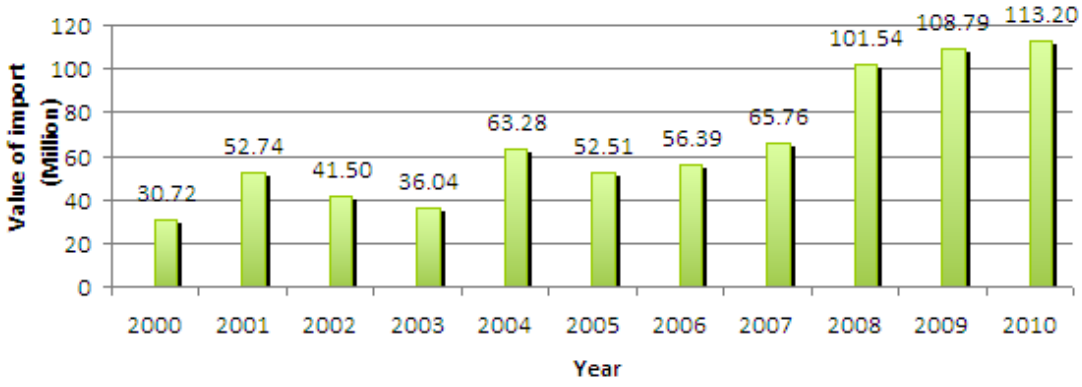

Figure 1.8: Value of imported fruits and vegetables from Japan since 2000 to 2010
Source: National Food Institute (2010)

In addition to China and Japan, Thailand imports various fruits and vegetables from the United States, these being mainly apples, strawberries and carrots. Besides being a country of multi-cultural society and ethnic groups, the United States of America also produces, cultivates and processes a wide variety of fruits and vegetables. Fruits and vegetables imported from the United States have an appetizing appearance and taste very good. This wide variety of fruits and vegetables are cultivated across the different states of America during different seasons. However, some states including California, Florida, and Washington remain the prime

production areas for the most important varieties in the U.S. nation's fruits and vegetable industry. Almost all fruits and vegetables in the United States depend on the water irrigation which originates from the vast agricultural valleys of California (Essman, 2010). The Apples from the United States, especially those grown in Washington State, include the varieties of Red delicious, Fuji, Gala and Pink Lady which are very popular in Thailand as well as other countries around the world. The reason for this is that Washington producers use organic methods to grow apples which leads to less disease pressure such as 'apple-scab' and lessons the likelihood of the crop being attacked by pests (State Symbols USA, n.d.).

Unlike other countries mentioned in this study-paper, the United States and Thailand do not have a FTA contract at this time. However, it is under the process of negotiation. On October 19th 2003 the President of the United States and the Thai Prime Minister agreed to negotiate about a bilateral free trade agreement (FTA). However, there are many issues that they have not concluded which are due to many issues such as the Thai gross domestic products figure (GDP) which is not much higher than the time when global trade analysis was stimulated. Although the price of imported fruits and vegetables from the United States are not competitive because of a very high tariff, Thailand still imported a very high volume of fruits and vegetables from the United States as shown by the 'bar-chart' in Figure 1.9. When the United States and Thailand both agree to an FTA contract in the very near future, the imported fruits and vegetables from the United States into Thailand will be more readily available and competitive in price. At this moment in time there is more than a 43% Thai tariff set against the United States imported agricultural products. The rate exceeded 20% compared to the normal 1.3% of the United States tariff lines (Raymond & Wayne, 2004).

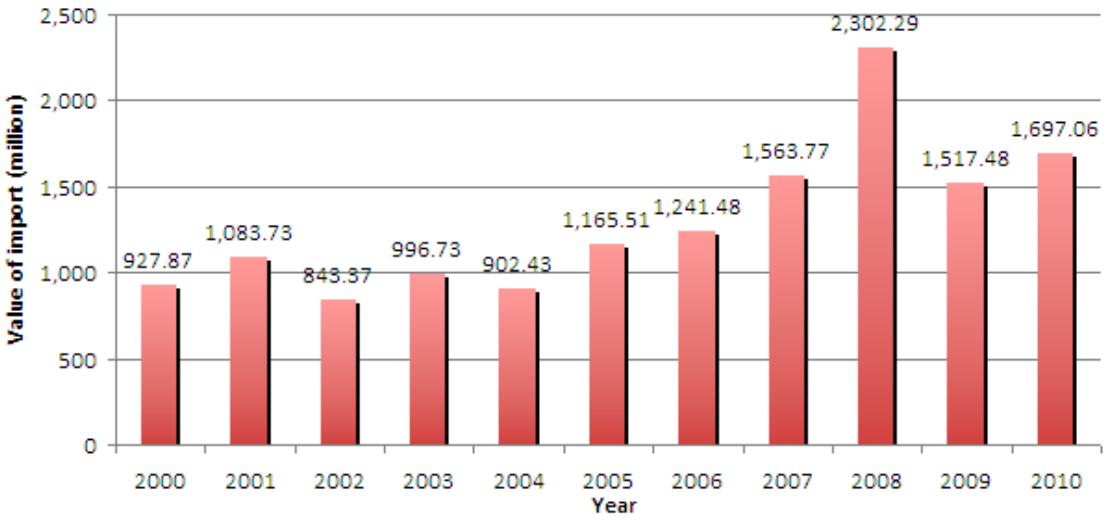

Figure 1.9: Value of imported fruits and vegetables from U.S. since 2000 to 2010
Source: National Food Institute (2010)

New Zealand fruits and vegetable agricultural products are well known in Thailand such as the kiwifruit, beans, strawberries and carrots. When considering kiwifruit, everyone immediately thinks of New Zealand because the Kiwi is their national symbol adopted from the image of a brown flightless bird. Now aggressively marketed the kiwifruit is very popular in Thailand and is more popular and preferred to the kiwifruit imported from China (Kiwi-fruit.info, 2007). New Zealand has its own leading cultivars including several varieties of kiwifruit including Abbott, Allison, Bruno, Hayward, Monty and Green hill. All of them are different in color, size and taste. Besides kiwifruit, New Zealand has also developed a thriving strawberry growing industry. Strawberries in New Zealand are usually grown as an annual crop, a large proportion being of a special large fruits variety which 'keeps' well and is suitable for export after the first planting and growing season (Morton, 1987).

The Thailand – New Zealand Closer Economic Partnership, abbreviated to TNZCEP became effective in April 2005. At that time, some fruits and vegetables tariffs were reduced to 0% immediately, this included apples, carrots and garlic. This agreement led to a Thailand tariff reduction to 0% for 89.72% of the total imported goods on 1st January 2010 including strawberries, raspberries and kiwifruit. As shown in Figure 1.10, the value of imported fruits and vegetables has increased since the

agreement became effective in 2005 (Office of the Permanent Secretary Ministry of Commerce, 2010).

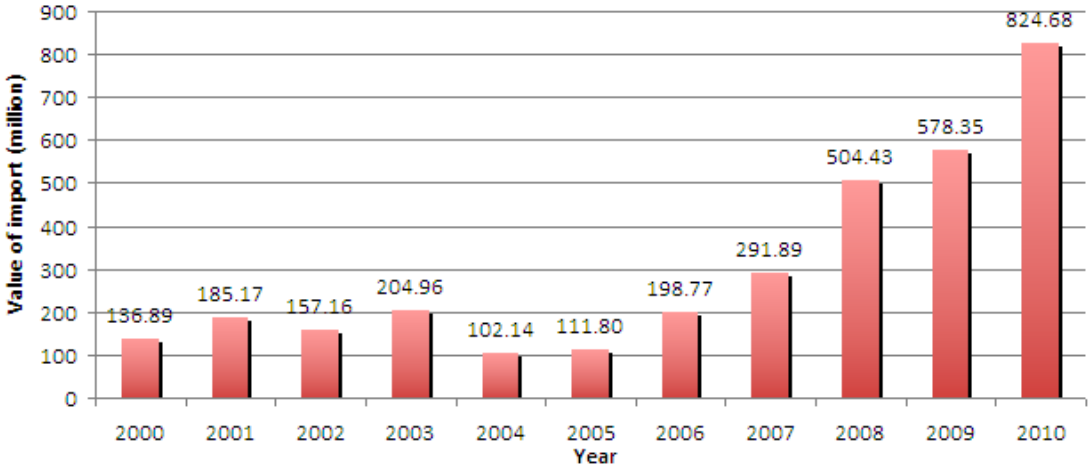

Figure 1.10: Value of imported fruits and vegetables from New Zealand since 2000 to 2010

Source: National Food Institute (2010)

When Thailand signed Free Trade Agreements with Australia, China, India, South Korea, New Zealand, Japan and Peru (United States FTA agreement I under negotiation), it meant that Thai consumers had a wider choice of fruits and vegetables. It also offered a choice of quality, packing and price. The price of the type of fruits selling in Thailand is varied depending on its country of origin and popularity which is presented in Table 1.3. Thai grocery stores and super markets are competing by persuading consumers to purchase these fruits and vegetable products imported from different countries and which are now selling in Thailand.

Table 1.3 Price of fruits and vegetables imported from different countries selling in Thailand

Fruits and Vegetables / Country	China	Japan	United States	New Zealand	Thailand
Kiwifruit	63/4 pcs.	90/4 pcs.	100/4 pcs.	140/4 pcs.	88/4 pcs.
Strawberries	60/250g	90/250g	219/250g	179/250g	75/250g
Carrots	35/kg	140/kg	55/kg	65/kg	49/kg

Source: Lotus and Tops Supermarket surveyed during May to July 2010

The Thai fruits and vegetable growers which count as 59.66% of the total Thai population can be affected in the long term including loss of their livelihood, longer working hours, less income and additional stress (Corporate Document Repository, n.d.). Moreover, Thai consumers have to be more careful about choosing fruits and vegetables from China because many problems may arise, including insecticide residue being present on their products which are used on plants and trees during the growing season (National Health Foundation, 2009).

1.3 Objectives of the Study

The purpose of this market research study-paper is to quantify the country of origin values in monetary units by measuring from the point of the customers' willingness to pay. (WTP) Moreover, it can help to study the behavior of Thai consumers by comparing the real price and their willingness to pay. This research will also suggest the business strategy to make Thai fruits and vegetables more competitive with the imported ones.

1.4 Significance of the Study

Thai consumers have many choices of fruits and vegetables from many countries. With many types of fruits in abundance coming into the country, Thai farmers are being adversely affected, because the fruits and vegetables that they produce are not considered to be the cheapest nor of the best quality. This market research and study-paper quantifies the value of the price for each fruits and vegetable and establishes whether or not a potential customer has a willingness to pay.

1.5 Scope of the Study

The scope of the study-paper is to evaluate the fruits and vegetables imported from different countries by comparing them to Thailand produce. The fruits and vegetables selected did not have a brand name shown on the package and

therefore customers would not be biased to a brand name rather than the country of origin. To be precise, if we want to choose five countries in the experiment for this paper, the five countries, which have the highest imported agricultural products, should be selected. However, that could make the fruits and vegetables selected for analysis in this paper beyond our investigation and analysis scope. Due to our limited budget, the focus has been made on only three types of fruits and vegetables, which are strawberries, kiwifruit and carrots. These two species of fruits and a single vegetable have been selected based on their popularity, and the imported amount. Some fruits are the indigenous representative of some countries and this could make this paper to be of greater interest if we can compare the results of these countries to others. For example, kiwifruit is the representative of New Zealand, and the study becomes more interesting if we can compare the final result relating to the supply of kiwifruit from other countries. Finally, the countries that are chosen to be in the experiment and study-paper include China, the United States, New Zealand, Japan and Thailand. The fruits and vegetables included in the experiment include strawberries, kiwifruit and carrots. Moreover, the countries selected are subject to the conditions of the Free Trade Agreement (FTA) with Thailand except the United States which has a FTA under the process of negotiation. The fruits and vegetables that we selected are mainly imported from the countries which Thailand have highest import volume, and their consumption had been affected after free trade agreements were signed, and also the popularity toward Thai consumers' perspectives. There are some biases in this experiment including sample and type of fruits and vegetables selection. The experiment requires 1 to 2 hours, and it would be inconvenient for the participants who are located far from the experiment room (MUIC). Therefore, the advertising media was posted near Bangkok and Nakornpratom province (near MUIC) which was limited in some specific areas only. The result might be varied if the samples selected from different location. Sixty subjects took part in this experiment which could establish a trend, but cannot truly represent the behaviors and buying patterns of the Thai consumers 'at large'. Moreover, the fruits and vegetables selected for future research should be the fruits and vegetables where Thailand has comparative advantages including orange, banana, watermelon and etc. In addition, we should conduct the experiment where the participants are seller instead of the end consumers.

CHAPTER II
LITERATURE REVIEW

2.1 Overview of Customers' Willingness to Pay (WTP)

There are many aspects that could affect customers' willingness to pay (WTP) for each product such as price, quality and brand awareness. A product brand name can influence a customer's decision on what to buy or make their buying decision easier. A brand-name can often demand a higher price due to the faith and belief in the products from that company. Most of the companies try to promote their brands by different ways using marketing activities including advertising, exhibitions, public relations and social interaction. If their marketing strategies are successful the benefits of a brand would include the customers' loyalty and an image of products in a positive way giving confidence in the quality of the product.

The customers' WTP effect can be classified by intrinsic and extrinsic values. The intrinsic factors are related to the physical characteristics of the products, but extrinsic factors are the external related issues such as manufacturing location, brand image and country of origin (COO) for each product (Shiffman & Kanuk, 2000). At the present time marketing strategies for qualified products explore new opportunities to build their brands, by using the image of their country of origin by its definition as "the country of manufacture, production or growth of that product" (U.S. Customs and Border Protection, n.d.).

In another study, the researchers have concluded that despite unclear relationship between consumer perceptions and the places where the food is produced, the country of origin can still provide some relationship to the quality and authenticity, which customers can perceive. British consumers have referred "rationality" not from a product's physical characteristics only, but also from the place they purchased (Tregear, Kuznesof & Moxey, 1998). The previous research on country of origin covers a variety of products which can be categorized into beverage, food, fruit and electronic products.

2.2 Beverage

There are many European researches and studies about customers' willingness to pay for products. One of these studies aims to identify the social characteristic that affect consumers' WTP for a wine labeled with the country of origin by using the consumer's survey. Their studies give two alternative econometric specifications to identify the characteristic that can affect Greek consumers' willingness to pay. The result of this study shows that consumers are willing to pay twice the price of a normal low quality wine only if an alternative product ensures the place of the origin of the more expensive wine. However, these decisions can be depended on only on the education of the customers and affiliation of those people toward the place of origin used in the experiment (Dimitris & Aleka , 2002).

Besides the studies made in European countries on the COO, the Taiwanese have conducted research about the willingness to pay premium prices for foods produced in Taiwan and it has some implication for the a label stating the country of origin. This study was conducted by using the experimental auction and contingent valuation method (CVM) in order to ensure the factors that truly affect consumers' willingness to pay for that product and which has country-of-origin labels. Taiwan, China and Vietnam "Oolong" teas are the products used in the testing by Vickrey's second price sealed bid auction. For CVM, the study uses the double-bounded dichotomous method. They started setting the same price of all products and varied the prices in later questions. The model shows that Taiwanese products are estimated to be at a greater premium for 58.1%, 78.15% and 98.13% more when compared to Chinese olives, Chinese Oolong tea, and Vietnam Oolong tea respectively. The study concludes that government should proclaim the country-of-origin law to enforce the increasing of economic advantages of Taiwan (Chun-Yu, 2008).

2.3 Food

Besides, consumers' willingness to pay for a mandatory country-of-origin label for a product, a study was also made by using steak and hamburger products. The result shows that the respondents were willing to pay an average of $1.53 and

$0.07 per pound extra on steak and hamburgers which had “U.S. Certified Steak” and “U.S. Certified Hamburger” on the packaging. This additional price factor is higher than the initial given price (Loureiro & Umberger, 2003).

An interesting study about country of origin was recently made in America. The researchers tested on the preference of U.S. consumer for domestic corn-fed beef versus international grass-fed beef measured by an experimental auction. The multinomial logic models and regression analysis is used in this study in order to identify the consumers who prefer certain flavor of beef. As the result, on average, consumers were willing to pay more 30.6% for the premium of domestic beef. 62% of the participants were willing to pay premium of $1.61 per pound for domestic corn-fed beef, 23% were willing to pay premium of $1.36 per pound more for the international grass-fed beef, and only 15% of the consumers could not see the differences among those types (Wendy, 2002).

When evaluating country-of-origin labels, a factor we need to consider is the image level of that country. For example, consumers normally discriminate against imported foods and electronics from developing countries (Chiang & Masson, 1998). The place of origin may represent product quality in term of higher costs such as environmental tax, higher product quality given (Haucap et al, 1997).

2.4 Fruits

Certain U.S. researchers studied the aspects of the fruit products between local and out-of-state producers by surveying households. They found that housewives and professionally occupied respondents were more likely to be willing to pay for a premium for locally produced tomatoes over other state tomato producers. The result of testing showed that apples, broccoli and cabbage are not priced-based where the products originate but come from the customers’ place of origin (Eastwood et al, 1987).

Additional studies in America also relating to the country of origin and its valuation, which was studied by running an experimental auction and which also used the corrective data and questionnaires to identify consumers’ willingness to pay for apples and tomatoes. The results show that the perception of quality of the consumer

food and its location are significant to the variables for determining the amount consumers are willing to pay for the products which have U.S. labels. Approximately 79% of consumers are willing to pay a premium price for fresh apples, which have "U.S.A. Grown" label while 72% are willing to pay a premium price for fresh tomatoes, which also have "U.S.A Grown" labels. The mean WTP for country of origin is calculated to be approximately $0.49 and $0.48 per pound of U.S. labeled apples and tomatoes respectively (Athur, 2005).

2.5 Electronic Products

There is a Thai study centered on the country-of-origin toward consumer willingness to pay for mobile handsets in a comparison between Scotland and Thailand. The researchers conducted the survey of 300 completed and usable questionnaires in data analysis numbering 150 in each country. The study reveals that the COO is not very sensitive in the evaluation. Other factors such durability, design, features, brand and price are more important than the COO. However, COO effects appear to have a stronger impact on Thai consumers rather than Scotland (Ibrahim & Sothornnopabutr, 2006).

CHAPTER III
METHODOLOGY

3.1 Sample Selection

In this study, we conducted a demand-revealing mechanism to discover the value of willingness to pay for particular products, focused on *n*th price auction, similar to Van Wechel et al. (2003), Huffman et al. (2003), and Rousu et al. (2004). The participants bid a value from the highest to the lowest, and the researchers randomly selected a random number from 1, to n, and the (n-1) highest bidders must purchase the fruits or vegetables at n highest price. The primary source of the data originates from six sessions of experiments which had 60 participants in total. The advantage of the closed experiment for valuing the WTP is the requirement of the participant amount not being necessary. The participants are selected under the assumption that everyone maximizes utility with resource constraint. The advertising media is posted near Bangkok and Nakornpathom, Thailand, because the experiment requires 1 to 2 hours and it would be inconvenient for the participants who are located far from the experiment room which is located in Mahidol University International Collage (MUIC), Nakornprathom, Thailand.

3.2 Sample Size Calculation

Each experiment consists of 6 sessions, which have 10 participants for each session. From the study, 10 participants are the suitable number for the experiment, as Lusk et al. (2001) which valued the WTP of 50 participants; separated into two groups, each group consisted of 18 and 32 participants. For another test, 112 participants being taken as the sample size of the consumers; separated those participants into 16-22 groups with 5-7 people in each group (Noussair et al., 2004). The amount of participants required for each session in this study are less than Lusk et al.'s (2001) but more than Noussair et al. (2002). All of the sessions require the same process of the experiment, but not separate from the small group.

3.3 Process of the Experiment

During the actual experimental date, all of the participants arrived 15 minutes before the actual experiment started. The researchers then gave an informed consent form to be approved from the participants. Any participant could leave if they were not willing to be part of the marketing analysis in the experiment. The researchers asked participants to choose the ID randomly including A, B, C, …, J, K, and L in order to hide their real identity during the experiment.

Having completed the above procedures 10 participants per session were prepared, the participants were invited into the given room. There were seats and tables provided for each participant with note-paper and pens given to the participants to use in the auction. Each session consisted of 7 rounds which included 2 rehearsal rounds and 5 actual rounds for different countries as details shown in Table 3.1. In order to eliminate the country order effects, the fruit and vegetables for each country were randomly arranged in the actual rounds of the experiment.

Table 3.1 Products used in the experiment for each session

Round	Products used in the experiment
R1	- One bag of salt
R2	- One piece of guava - One bag of dried banana - One bag of tamarind
A1	- One pack of strawberries imported from China - One pack of kiwifruit imported from China - One pack of carrots imported from China
A2	- One pack of strawberries imported from the United States - One pack of kiwifruit imported from the United States - One pack of carrots imported from the United States
A3	- One pack of strawberries imported from New Zealand - One pack of kiwifruit imported from New Zealand - One pack of carrots imported from New Zealand
A4	- One pack of strawberries imported from Japan - One pack of kiwifruit imported from Japan - One pack of carrots imported from Japan
A5	- One pack of strawberries grown in Thailand - One pack of kiwifruit grown in Thailand - One pack of carrots grown in Thailand

The researchers explained the procedures in detail and distributed the auction document and the fruit and vegetables required for each round. Every pack of fruits and vegetables for each actual round was labeled with the name of each country

with the weight of particular fruits and vegetables as shown in Figure 3.1 below. The participants wrote down the price that they were willing to buy in the given paper notes. After that, the researchers would summarize the entire bid price from highest to lowest and the decision number would be randomly selected by the researchers. The participants who bid between the highest and the lowest one, higher than the decision number would win the auction, and they had to buy the goods at the price of the decision number by using the endowed money.

Actual Round 1

Strawberries Imported from China 250 grams	Kiwifruit Imported from China 44.8 grams	Carrots Imported from China 250 grams

Actual Round 2

Strawberries Imported from United States 250 grams	Kiwifruit Imported from United States 44.8 grams	Carrots Imported from United States 250 grams

Actual Round 3

Strawberries Imported from New Zealand 250 grams	Kiwifruit Imported from New Zealand 44.8 grams	Carrots Imported from New Zealand 250 grams

Actual Round 4

Strawberries Imported from Japan 250 grams	Kiwifruit Imported from Japan 44.8 grams	Carrots Imported from Japan 250 grams

Actual Round 5

Strawberries Grown in Thailand 250 grams	Kiwifruit Grown in Thailand 44.8 grams	Carrots Grown in Thailand 250 grams

Figure 3.1 Actual round labels of fruit and vegetables used in the experiment

During the process, if any participant wanted to exit from the experiment they had to return 500 baht to the leader conducting the experiment. The whole process of the experiment required approximately 60 minutes. The experiments were conducted in a closed room at Mahidol University International Collage (MUIC), Salaya, Nakornpathom, Thailand. The date of the auction arrangement was made during December 2010. Sixty subjects were selected to participate in the experiment. There were six sessions of experiments which included 10 participants for each session. The demographic of the subjects are shown in Table 3.2. The average age of the participants was 33.92 years old, the oldest subject is 47 years old and the youngest subject is 25 years old. The participants were mainly female which represents 80% of the total; 95% of the participants have a bachelor degree or higher. The average income of the participants was found to be between 10,000 Baht to 24,999 Baht, and most have full-time jobs and were considered as the main shopper. The average number of people in a household for the subjects participating was approximately 4 people.

Table 3.2 Demographic characteristics of subjects

Variable	Definition	Mean [SD]
Age	Age of subjects	33.92 [4.99]
Sex	Male = 1, Female = 0	0.20 [0.40]
Education	Bachelor degree or higher = 1, Otherwise = 0	0.95 [0.22]
Income	Below Baht 5,000 = 1, Baht 5,000 - 9,999 = 2, Baht 10,000 - 24,999 = 3, Baht 25,000 - 49,999 = 4, Baht 50,000 - 99,999 = 5, Over Baht 100,000 = 6	3.32 [0.70]
Job	Full time = 4, Part time = 3, Don't have part time and full time job = 2, Student = 1	3.93 [0.31]
Household	Number of members in the household	4.38 [1.96]
Shopper	Main shopper = 1, Otherwise = 0	0.60 [0.49]

In the questionnaire, we also asked three questions which would enable us to analyze the shoppers' behavior as shown in Table 3.3. The first question asked was to see how important the subjects considered the importance of the country of origin to be. If they considered that the country of origin issue as being the most important, five points would be given and one for vise-versa. Fifty-five percent of the participants considered the country of origin as important and thirty-five percent considered the country or origin issue as very important. The second question asked was to determine the buying frequency of the imported fruits and vegetables being consumed. Five points were given if the participants regularly purchased and consumed the product and one point if the product had never been consumed before. It was shown the forty-seven percent occasionally consumed imported fruits and vegetables. The final question asked was whether they knew the country of origin for fruit and vegetables when they made their purchase. Three points were given if they knew, and one point if they were not sure. The results showed that they mostly were uncertain about the country of origin for the fruit and vegetables that they consumed.

Table 3.3 Consumers' behavior towards the country of origin

Variable	Definition	Mean [SD]	Percentage
The importance of country of origin	The most important = 5	3.45 [0.67]	7%
	Very important = 4		35%
	Important = 3		55%
	Less important = 2		3%
	Not important = 1		0%
Frequency of consumption of imported fruits	Always = 5	3.10 [0.73]	0%
	Often = 4		32%
	Sometimes = 3		47%
	Rarely = 2		22%
	Never = 1		0%
The realization of COO of fruits participants buy	Realize = 3	1.97 [0.86]	35%
	Not realize = 2		27%
	Not sure = 1		38%

CHAPTER IV
RESULT ANALYSIS

4.1 Comparison between Thailand and Other Countries

The experiment and market analysis shows that Thai consumers have a negative or neutral attitude toward fruit and vegetables produced in Thailand, being the same as China when compared to other countries. As shown in Table 4.1 and 4.2, Thai consumers' WTP for Thai fruits and vegetables is the lowest compared to other countries selected for this experiment. The average WTP for all of the fruits and vegetables produced in Thailand is approximately 18.87 Baht per pack which was used in the experiment or 26.38% lower than products imported from U.S., this being 25.45% lower than imports from Japan, and 24.65% lower than imports from New Zealand. Thai consumers had the highest average bid toward strawberries and carrots imported from U.S. which is 31.15 Baht and 11.43 Baht, kiwifruit from New Zealand was bid at 34.77 Baht. As the result, all of the fruit and vegetables imported from the U.S. had the highest average bid.

Table 4.1 WTP percentages discount of fruits and vegetables produced in Thailand compared to other countries

Country/Fruit	China	Japan	U.S.	New Zealand
Strawberries	-2.08%	-25.86%	-28.96%	-24.03%
Kiwifruit	-0.26%	-23.33%	-22.55%	-23.55%
Carrots	-2.11%	-30.82%	-30.88%	-29.65%
Total	-1.24%	-25.45%	-26.38%	-24.65%

Table 4.2 Average bids of fruits and vegetables from different countries

Country/Fruits	Strawberries (Baht/pack)	Kiwifruit (Baht/pack)	Carrots (Baht/pack)	Average bids of all fruits (Baht/pack)
Thailand	22.13	26.58	7.90	18.87
China	22.60	26.65	8.07	19.10
Japan	29.85	34.67	11.42	25.31
U.S.	31.15	34.32	11.43	25.63
New Zealand	29.13	34.77	11.23	25.04

It is believed that the goods from China were the lowest price and with the lowest quality when compared to the imports from other countries. However, if compared to China, the percentage of bidding for all of the fruit and vegetables produced in Thailand were considered to be equal to the fruits imported from China. This counted as a 36.67%. Increase on bidding for fruits produced in Thailand counted as a 35%, and decrease in bidding for the fruits produced in Thailand, being 28.33% as shown in Table 4.3. These figures indicate that Thai consumers tend to value fruits and vegetables produced in Thailand equal or lower to the products imported from China.

Table 4.3 Comparison between fruits and vegetables produced in Thailand and imported from other countries

Thailand VS China	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from Thailand and China	66	36.67%
Increase bids for fruit from Thailand	63	35.00%
Decrease bids for fruit from Thailand	51	28.33%

Thailand VS Japan	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from Thailand and Japan	41	22.78%
Increase bids for from Thailand	16	8.89%
Decrease bids for fruit from Thailand	123	68.33%

Thailand VS US	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from Thailand and U.S.	41	22.78%
Increase bids for fruit from Thailand	15	8.33%
Decrease bids for fruit from Thailand	124	68.89%

Thailand VS New Zealand	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from Thailand and New Zealand	45	25.00%
Increase bids for fruit from Thailand	6	3.33%
Decrease bids for fruit from Thailand	129	71.67%

In term of statistical factors as shown in Table 4.4, the null-hypothesis of 'no-difference' between the average bid for all fruits and vegetables produced in Thailand and imported from China shows an equal acceptance of products between China and Thailand. In addition, all of null-hypothesis or 'no-difference' between the average bid for all fruits and vegetables produced in Thailand and imported from Japan, the United States and New Zealand are rejected.

Thai consumers are willing to pay extra for fruit and vegetables imported from Japan, U.S. and New Zealand at a higher price compared to fruit and vegetables grown in Thailand and China as shown in Table 4.2. The average bid WTP for fruit and vegetables imported from Japan, the United States and New Zealand are 25.31 Baht/Pack, 25.63 Baht/Pack and 25.04 Baht/Pack respectively; compared to Thailand which is approximately 18.87 Baht/Pack. The percentage of decrease bid for fruits produced in Thailand compared to Japan, the United States and New Zealand are 68.33%, 68.89% and 71.67% respectively as shown in Table 4.3 which is considerably higher. On the other hand, consumers are willing to pay for fruit and vegetables grown in Thailand and are statistically the same with imports from China which is lower than the other 3 countries.

Table 4.4 t-Test statistics of fruits and vegetables in Thailand compared to imports from other countries

Difference between an average bid for Strawberries produced in Thailand and imported from the countries listed below	t-Test statistics	p-Value
China	-0.263	0.794
Japan	-4.368	0.000**
U.S.	-4.427	0.000**
New Zealand	-7.442	0.000**

Difference between an average bid for kiwifruit produced in Thailand and imported from the countries listed below	t-Test statistics	p-Value
China	-0.053	0.958
Japan	-5.397	0.000**
U.S.	-5.031	0.000**
New Zealand	-5.990	0.000**

Difference between an average bid for carrots produced in Thailand and imported from the countries listed below.	t-Test statistics	p-Value
China	-0.377	0.708
Japan	-5.122	0.000**
U.S.	-5.168	0.000**
New Zealand	-5.602	0.000**

Difference between an average bid for 3 types of fruit (strawberries, kiwifruit and carrots) produced in Thailand and imported from the countries listed below	t-Test statistics	p-Value
China	-0.317	0.752
Japan	-7.895	0.000**
U.S.	-7.571	0.000**
New Zealand	-10.217	0.000**

**P-value < 0.01 *P-value < 0.05

4.2 Comparison between China and Other Countries

The results from Table 4.5 show that the Thai consumers' attitude toward fruit and vegetables imported from China are negative as we expected. This is shown by the percentage of decrease bid for fruits and vegetables imported from China compared to Japan, the U.S. and New Zealand and is considerably higher; for example, 70.00%, 67.78% and 73.33% respectively.

Table 4.5 Comparison between fruits and vegetables imported from China and imported from other countries

China VS Thailand	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from Thailand and China	66	36.67%
Increase bids for fruit from Thailand	51	28.33%
Decrease bids for fruit from Thailand	63	35.00%

China VS Japan	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from China and Japan	35	19.44%
Increase bids for fruit from China	19	10.56%
Decrease bids for fruit from China	126	70.00%

China VS US	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from China and U.S.	50	27.78%
Increase bids for fruit from China	8	4.44%
Decrease bids for fruit from China	22	67.78%

China VS New Zealand	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from China and New Zealand	41	22.78%
Increase bids for fruit from China	7	3.89%
Decrease bids for fruit from China	132	73.33%

T-test statistics in Table 4.6 supports the theory that null-hypothesis of 'no-difference' between average bid for fruits and vegetables imported from China and those imported from Japan, the United States and New Zealand and can be rejected. In Thailand from the consumers' point of view, the goods from China are always considered being at a lower price with lower quality. As the average bid of the fruits and vegetables imported from China is only 19.10 Baht per pack, which shown in Table 4.2, this is considered to be low compared to Japan, the U.S. and New Zealand. WTP for Chinese fruits and vegetables shows that the percentage discount to the United States as 25.46%, Japan as 24.52% and New Zealand as 23.71%. However, when compared to Thailand, China has a percentage premium of 1.25%. However, the null-hypothesis of 'no- difference' for fruits and vegetables imported from China and produced in Thailand cannot be rejected.

Table 4.6 t-Test statistics of fruits and vegetables imported from China compared to other countries

Difference between an average bid for Strawberries imported from China and imported from countries listed below	t-Test statistics	p-Value
Thailand	-0.263	0.794
Japan	-3.146	0.003*
U.S.	-5.045	0.000**
New Zealand	-3.222	0.002*

Difference between an average bid for kiwifruit imported from China and imported from countries listed below	t-Test statistics	p-Value
Thailand	-0.053	0.958
Japan	-4.428	0.000**
U.S.	-5.716	0.000**
New Zealand	-6.827	0.000**

Difference between an average bid for carrots imported from China and imported from countries listed below	t-Test statistics	p-Value
Thailand	-0.377	0.708
Japan	-5.386	0.000**
U.S.	-5.980	0.000**
New Zealand	-6.771	0.000**

Difference between an average bid for 3 types of fruit (strawberries, kiwifruit and carrots) imported from China and imported from countries listed below	t-Test statistics	p-Value
Thailand	-0.317	0.752
Japan	-6.176	0.000**
U.S.	-8.596	0.000**
New Zealand	-7.338	0.000**

**P-value < 0.01 * P-value < 0.05

4.3 Comparison between Japan and Other Countries

Compared to the fruit produced in Thailand and imported from China, 68.33% and 70.00% of the participants made a bid higher for the fruit and vegetables imported from Japan. When compared to New Zealand, 36.11% of the participants lowered the value of their bids for the fruit imported from Japan. Additionally, 36.67% of the participants placed an equal price value for fruit and vegetables imported from Japan and from the U.S. as shown in Table 4.7.

Table 4.7 Comparison between fruits and vegetables imported from Japan and produced/imported from other countries

Thailand	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from Japan and Thailand	41	22.78%
Increase bids for fruit from Japan	123	68.33%
Decrease bids for fruit from Japan	16	8.89%

China	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruits from Japan and US	35	19.44%
Increase bids for fruits from Japan	126	70.00%
Decrease bids for fruits from Japan	19	10.56%

U.S.	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from Japan and U.S.	66	36.67%
Increase bids for fruit from Japan	52	28.89%
Decrease bids for fruit from Japan	62	34.44%

New Zealand	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from Japan and New Zealand	60	33.33%
Increase bids for fruit from Japan	55	30.56%
Decrease bids for fruit from Japan	65	36.11%

However, when analyzing by t-test as represented in Table 4.8, it shows that the null-hypothesis of ‘no-difference’ between the average bid for all fruits and vegetables imported from Japan and imported from New Zealand as well as the United States is accepted. The null-hypothesis of ‘no- difference’ between the average bid for all fruits and vegetables imported from Japan and produced in Thailand as well as imported from China is rejected. Therefore it can be concluded that Thai consumers have the same positive attitude toward the products from Japan, the United States and New Zealand and vise versa for Thailand and China.

Table 4.8 t-Test statistics of fruits and vegetables imported from Japan compared to other countries

Difference between an average bid for strawberries imported from Japan and those imported from the countries listed below	t-Test statistics	p-Value
Thailand	-4.368	0.000**
China	-3.146	0.003*
U.S.	-826	0.412
New Zealand	0.484	0.630

Difference between an average bid for kiwifruit imported from Japan and those imported from the countries listed below.	t-Test statistics	p-Value
Thailand	-5.397	0.000**
China	-4.428	0.000**
U.S.	0.246	0.807
New Zealand	0.064	0.949

Difference between an average bid for carrots imported from Japan and those imported from the countries listed below	t-Test statistics	p-Value
Thailand	-5.122	0.000**
China	-5.386	0.000**
U.S.	-0.036	0.972
New Zealand	0.349	0.729

Difference between an average bid for 3 types of fruit (strawberries, kiwifruit and carrots) imported from Japan and imported from the countries listed below.	t-Test statistics	p-Value
Thailand	-7.895	0.000**
China	-6.176	0.000**
U.S.	-0.446	0.656
New Zealand	0.362	0.718

**P-value < 0.01 *P-value < 0.05

4.4 Comparison between U.S. and Other Countries

Compared to the fruits produced in Thailand and imported from China, 68.89% and 67.78% of the participants gave a higher bid for the fruits and vegetables imported from Japan. And 36.67% of the participants valued an equal price for fruit and vegetables imported from Japan and the U.S. as well as 42.22% compared to New Zealand as shown in the Table 4.9. This could support the fact that Thai consumers have the same positive attitude toward the fruit and vegetables imported from Japan, the U.S. and New Zealand.

Table 4.9 Comparison between fruits imported from the U.S. and produced/imported from other countries

Thailand	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from U.S. and Thailand	41	22.78%
Increase bids for fruit from U.S.	124	68.89%
Decrease bids for fruit from U.S.	15	8.33%

China	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from U.S. and China	50	27.78%
Increase bids for fruit from U.S.	122	67.78%
Decrease bids for fruit from U.S.	8	4.44%

Japan	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from U.S. and Japan	66	36.67%
Increase bids for fruit from U.S.	62	34.44%
Decrease bids for fruit from U.S.	52	28.89%

New Zealand	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from U.S. and New Zealand	76	42.22%
Increase bids for fruit from U.S.	52	28.89%
Decrease bids for fruit from U.S.	52	28.89%

Statistically proved by the t-test statistics as shown in Table 4.10, the null-hypothesis of 'no-difference' between the average bid for all fruits and vegetables imported from the United States and those imported from Japan as well as New Zealand is accepted. Moreover, the null-hypothesis of 'no-difference' between the average bid for all fruits and vegetables imported from Japan and produced in Thailand as well as imported from China can be rejected. This can be concluded that Thai consumers have the same positive attitudes toward the products from Japan, the United States and New Zealand and vise-versa for Thailand and China.

Table 4.10 t-Test statistics of fruits and vegetables imported from U.S. compared to other countries

Difference between an average bid for strawberries imported from US and those imported from the countries listed below	t-Test statistics	p-Value
Thailand	-4.427	0.000**
China	-5.045	0.000**
Japan	-0.826	0.412
New Zealand	1.043	0.301

Difference between an average bid for kiwifruit imported from the US and imported from the countries listed below	t-Test statistics	p-Value
Thailand	-5.031	0.000**
China	-5.716	0.000**
Japan	0.246	0.807
New Zealand	-0.424	0.673

Difference between an average bid for carrots imported from the U.S. and those imported from the countries listed below	t-Test statistics	p-Value
Thailand	-5.168	0.000**
China	-5.980	0.000**
Japan	-0.036	0.972
New Zealand	0.591	0.557

Difference between an average bid for 3 types of fruit (Strawberries, kiwifruit and carrots) imported from the United States and imported from the countries listed below	t-Test statistics	p-Value
Thailand	-7.571	0.000**
China	-8.596	0.000**
Japan	-0.446	0.656
New Zealand	0.792	0.430

**P-value < 0.01 *P-value < 0.05

4.5 Comparison between New Zealand and Other Countries

According to the results of the market research experiment, the participants bid a higher price for fruits and vegetables from New Zealand when compared to prices bid to products of Thailand, China and Japan. This is shown as the percentage of 71.67%, 73.33% and 36.11% respectively as shown by Table 4.11. They made an equal value bid for fruit imported from New Zealand and from the United States.

Table 4.11 Comparison between fruits imported from New Zealand and produced/imported from other countries

Thailand	No. of bids	Percentage
Number of all bids(3 fruits)	180	100.00%
Equal bids of fruit from New Zealand and Thailand	45	25.00%
Increase bids for fruit from New Zealand	129	71.67%
Decrease bids for fruit from New Zealand	6	3.33%

China	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from New Zealand and China	41	22.78%
Increase bids for fruit from New Zealand	132	73.33%
Decrease bids for fruit from New Zealand	7	3.89%

Japan	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from New Zealand and Japan	60	33.33%
Increase bids for fruit from New Zealand	65	36.11%
Decrease bids for fruit from New Zealand	55	30.56%

The United States	No. of bids	Percentage
Number of all bids (3 fruits)	180	100.00%
Equal bids of fruit from New Zealand and US	76	42.22%
Increase bids for fruit from New Zealand	52	28.89%
Decrease bids for fruit from New Zealand	52	28.89%

The t-test statistics shown in Table 4.12 also support the above results as the null-hypothesis of ‘no-difference’ between the fruits imported from New Zealand and the fruits imported from Japan and U.S. are accepted. The null-hypothesis of ‘no-difference’ between the fruits imported from New Zealand and the fruits produced in Thailand and imported from China is rejected. From the Thai consumers’ perspective, kiwi imported from New Zealand is very popular as its average bidding price is the highest which is 34.77 Baht per pack. However, the t-test statistic result indicates that kiwifruit imported from New Zealand, the U.S and Japan have ‘no-difference’ as the null-hypothesis of the difference is accepted.

Table 4.12 t-Test statistics of fruits and vegetables imported from New Zealand compared to other countries

Difference between an average bid for Strawberries imported from New Zealand and imported from the countries listed below	t-Test statistics	p-Value
Thailand	-7.442	0.000**
China	-3.222	0.002*
Japan	0.484	0.630
U.S.	1.043	0.301

Difference between an average bid for kiwifruit imported from New Zealand and imported from the countries listed below	t-Test statistics	p-Value
Thailand	-5.990	0.000**
China	-6.827	0.000**
Japan	-0.064	0.949
U.S.	-0.424	0.673

Difference between an average bid for carrots imported from New Zealand and imported from the countries listed below	t-Test statistics	p-Value
Thailand	-5.602	0.000**
China	-6.771	0.000**
Japan	-0.349	0.729
U.S.	0.591	0.557

Difference between an average bid for 3 types of fruit (Strawberries, kiwifruit and carrots) imported from New Zealand and imported from the countries listed below	t-Test statistics	p-Value
Thailand	-10.217	0.000**
China	-7.338*	0.000**
Japan	-0.362	0.718
U.S.	0.792	0.430

**P-value < 0.01 *P-value < 0.05

CHAPTER V
CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The experiment by '*n*th price auction' proved that Thai consumers have a negative attitude toward the fruit and vegetables produced in Thailand and those imported from China, compared to fruit and vegetables from Japan, the United States and New Zealand. The kiwifruit imported from New Zealand is the most popular for Thailand consumers as it achieved the highest average bid value, which is 34.77 Baht per pack. Strawberries and carrots imported from the United States achieved the highest bidding with the price at 31.15 and 11.43 Baht per pack.

The subjects taking part in the experimental study agreed to bid for the fruits and vegetables produced in Thailand with WTP discounts by 26.38% from the United States, 25.45% from Japan and 24.65% from New Zealand. Moreover, the statistical test supports that the average bidding values for fruits and vegetables imported from China including strawberries, kiwifruit and carrots are not different from bidding values of fruit and vegetables produced in Thailand. As a result, this could be considered as the main problem for the market-sector growth of Thai fruits and vegetables, because China can offer lower prices resulting from their competitive production advantages with an extra advantage of 0% tariff resulting from the FTA agreement signed on the 1st of October 2003 (Early Harvest between Thailand and China Under Thailand and China Free Trade Agreement, n.d.). After the agreement was signed the value of imports into Thailand for fruit and vegetables from China has increased rapidly (National Food Institute, 2010). Additionally, Thai consumers consider that the fruit and vegetables of both Thailand and China to be on the same level of quality.

Unlike other countries mentioned in this paper, the United States and Thailand do not have a Free Trade Agreement at this moment but an agreement is in the process of negotiation. Without favourable tariffs, imported fruit and vegetables

from the United States are not competitive because more than 43% of imported agricultural products from the United States are penalized with more than a 20% tariff rate compared to 1.3% of the United States tariff lines (Raymond & Wayne, 2004). Thailand still imported a very high volume of fruit and vegetables from the United States as shown in Figure 1.9. From this experiment it appears that the subjects are willing to pay for the fruits and vegetables imported from the United States including kiwifruit and carrots at the higher price. Fruit and vegetables produced in Thailand might be replaced by the imports from the United States in the future after an FTA agreement between these two countries has been approved.

5.2 Recommendation

By comparing the percentage of the WTP discount of fruit and vegetables produced in Thailand with the percentage of premium of discount for the actual price of particular fruit and vegetables, the price of fruit and vegetables produced in Thailand can be considered as the main problem for the fruit and vegetables market-sector growth in Thailand. According to the statistical test, the willingness to pay for fruit and vegetables from growers in Thailand and those imported from China are not significantly different. However, the market price of strawberries, kiwifruit and carrots produced in Thailand has a percentage premium compared to the same type of fruit and vegetables imported from China the figures being up to 25%, 39.68% and 40% respectively as shown in Table 5.1. As a commercial and investment move, a choice can be made whether Thai fruits and vegetables growers should set their fruit and vegetables prices lower than the prices of imported product from China. It follows that Thai consumers might decide to buy the imported fruit and vegetables from China rather than those produced in Thailand because they consider that both products are equal in quality but the Chinese product has a price advantage. The prices set for these Thai products should be in the range of the WTP percentage discount of average bids as shown in the Table 5.1 below. To protect and support the market-sector growth of Thai fruits and vegetables, Thai government should consider adopting a policy where the price of fruit and vegetables produced in Thailand is subsidised. According to the statistical test results analysed from this experiment, there were no differences found

in the fruits and vegetables imported from Japan, U.S. and New Zealand. However, if one compares the fruits and vegetables from these three countries to the products of Thailand, the null hypothesis of 'no difference' is rejected. The WTP percentage discount of fruits and vegetables produced in Thailand to those of Japan, U.S. and New Zealand are in the percentage range of 22.55% to 30.88% as shown in Table 4.1. This implies that if the absolute percentage of actual or market price discount is higher than the WTP discount of fruit and vegetables produced in Thailand compared to particular countries including Japan, the United State and New Zealand, the price of fruits and vegetables produced in Thailand is already acceptable by Thai consumers. Conversely, on the other hand, if the absolute percentage of actual price discount is lower than the WTP discount of fruit and vegetables produced in Thailand compared to particular countries, Thai fruit and vegetable growers and retailers should be recommended to set the selling price lower according to the percentage discount of WTP.

Table 5.1 Comparison of market prices and bids between Thailand and other countries

Fruits& Vegetables	**Thailand**	**China**			**Japan**		
	Market Price/Pack (Baht)	Market Price/Pack (Baht)	% Difference between market prices of Thailand and China.	% Difference between average bids of Thailand and China	Market Price/Pack (Baht)	% Difference between market prices of Thailand and Japan	% Difference between average bids of Thailand and Japan
Strawberries	75	60	25.00%	-2.08%	90	-16.67%	-25.86%
Kiwifruit	88	63	39.68%	-0.26%	90	-2.22%	-23.33%
Carrots	49	35	40.00%	-2.11%	140	-65.00%	-30.82%

Fruit & Vegetables	Thailand	United States			New Zealand		
	Market Price/Pack (Baht)	Market Price/Pack (Baht)	% Difference between market prices of Thailand and U.S.	% Difference between average bids of Thailand and U.S.	Market Price/Pack (Baht)	% Difference between market prices of Thailand and New Zealand	% Difference between average bids of Thailand and New Zealand
Strawberries	75	219	-65.75%	-28.96%	179	-58.10%	-24.33%
Kiwifruit	88	100	-12.00%	-22.55%	140	-37.14%	-23.55%
Carrots	49	55	-10.91%	-30.88%	65	-24.62%	-29.65%

Table 5.2 Comparison WTP Percentage Discount and Actual Price Percentage Premium or Discount of kiwifruit imported from New Zealand and other countries

Fruit & Vegetables	New Zealand	United States			Japan		
	Market Price/Pack (Baht	Market Price/Pack (Baht	% Difference between market prices of Thailand and U.S.	% Difference between average bids of Thailand and U.S.	Market Price/Pack (Baht	% Difference between market prices of Thailand and Japan	% Difference between average bids of Thailand and Japan
Kiwifruit	140	100	40.00%	1.31%	90	55.56%	0.29%

Some countries have the reputation in some particular fruits such as kiwifruit imported from New Zealand. In terms of statistical testing, the null-hypothesis of 'no-difference' between kiwifruit imported from New Zealand, the United States and Japan cannot be rejected. According to Table 5.2 above, kiwifruit imported from New Zealand has a premium of actual price percentage being approximately 40% and 55.56% compared to the United States and Japan respectively, while the percentage premium of WTP compared to these two countries are only 1.31% and 0.29% respectively.

This could indicate that although some countries do not have the reputation in some particular fruits or vegetables, they can be purchased by Thai consumers. In cases where the prices of imported fruits from the countries which grow

the popular fruit and vegetables, they have a percentage premium higher than WTP percentage premium compared to other countries which are already acceptable to Thai consumers.

On the other hand, if the absolute percentage of actual price discount is lower than the WTP discount of fruit and vegetables produced in Thailand compared to particular countries, the Thai fruit and vegetable growers and retailers should be recommended to set the price lower according to the percentage discount of WTP.

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