Consumer Willingness to Pay for Organic Food in Thailand: Evidence from the Random *n*th-Price Auction Experiment*

ความเต็มใจในการจ่ายอาหารอินทรีย์ในประเทศไทย หลักฐานจากวิธีการประมูลแบบ Random *n*th-Price

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ABSTRACT

The demand for organic food in Thailand has been rising over the past decades. Thai consumers now have to choose from several types of product labels which convey organic quality. The purpose of this research is to study the willingness to pay for organic food, that has been affixed with different types of labels. 72 representative Thai consumers were recruited to participate in the experiment, in which they had to bid for jasmine rice, carrots, and eggs, under the random *n*th-price auction technique. The results showed that when compared to the normal label, Thai consumers were willing to pay premiums of 28%, 29%, and 17% respectively for jasmine rice, carrots, and eggs that were affixed with the certified "Organic Thailand" labels. Organic food has the credence quality amongst Thai consumers, who appear to trust organic certification as certifying such quality. These premiums were statistically higher than premiums for Safe Food labels, which commanded premiums of 20% for jasmine rice, 12% for carrots, and 10% for eggs. Self-proclaimed organic food did not receive additional premiums, since consumers were indifferent when noncertified organic labels were attached. In addition, providing consumers additional information about organic food and certification had the effect of raising price premiums for organic food. The findings suggest that policy makers should set an unambiguous and unified policy on food labeling, and aggressively communicate the benefits of organic certification to the general public.

Keywords: Organic Food, Willingness to Pay, Food Label, Random *n*th-Price Auction

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บทคัดย่อ

ในขณะที่อุปสงค์ของอาหารอินทรีย์ในประเทศไทยเพิ่มขึ้นอย่างต่อเนื่องในหลายทศวรรษที่ผ่านมา ผู้บริโภคไทยต้องเลือกระหว่างฉลากอาหารหลายรูปแบบที่สื่อถึงคุณภาพของอาหารอินทรีย์ วัตถุประสงค์ของงานวิจัยนี้คือ เพื่อศึกษาความเต็มใจในการจ่ายอาหารอินทรีย์ภายใต้ฉลากอาหารที่แตกต่างกัน งานวิจัยอาศัยตัวแทนของผู้บริโภคคนไทยจำนวน 72 คน เพื่อเข้าร่วมการทดลอง โดยผู้เข้าร่วมการทดลองต้องประมูล ข้าว แครอท และไข่ ภายใต้วิธีการประมูลแบบ random *n*th-price ผลการประมูลพบว่า เมื่อเปรียบเทียบกับอาหารทั่วไป ผู้บริโภคยินดีจ่ายเพิ่ม 28% 29% และ 17% สำหรับ ข้าว แครอท และไข่ ที่ติดฉลากรับรองอาหารอินทรีย์ ซึ่งแสดงว่าอาหารอินทรีย์เป็นสินค้าที่ต้องอาศัยความน่าเชื่อถือจากฉลากรับรองฯ ดังกล่าว นอกจากนี้ ความเต็มใจจ่ายเพิ่มเติมให้แก่อาหารอินทรีย์นี้สูงกว่าอาหารที่ติดฉลากอาหารปลอดภัย ซึ่งได้รับราคาเพิ่มเติมที่ 20% 12% และ 10% สำหรับ ข้าว แครอท และไข่ ตามลำดับ สำหรับอาหารอินทรีย์ที่ไม่ได้รับการรับรองนั้น ไม่ได้รับความเต็มใจในการจ่ายเพิ่มเติมจากผู้บริโภค นอกจากนี้พบว่า ผู้เข้าร่วมการทดลองครึ่งหนึ่งที่ได้รับข้อมูลเพิ่มเติมเกี่ยวกับอาหารอินทรีย์และฉลากรับรองอาหารอินทรีย์ ได้เต็มใจจ่ายเพิ่มเติมสูงขึ้นให้แก่อาหารอินทรีย์ ข้อเสนอแนะจากผลการศึกษาคือ นโยบายเกี่ยวกับฉลากอาหารจำเป็นต้องมีความชัดเจนและมีเอกภาพ ในขณะเดียวกันควรเน้นการสื่อสารเชิงรุกเกี่ยวกับประโยชน์ของการรับรองอาหารอินทรีย์ให้ผู้บริโภครับทราบ

คำสำคัญ : อาหารอินทรีย์ ความเต็มใจในการจ่าย ฉลากอาหาร การประมูลแบบ Random *n*th-Price

INTRODUCTION

Future trends for organic food seem promising. World demand for organic food was forecasted to reach $100 billion in 2010 (Post Today, 2009). Even though Thailand was in an economic slowdown, the country's exports of organic foods reached double-digit growth rates. These export markets were the United States, United Kingdom, Scandinavian countries, and Singapore. Although Thai organic producers rely mostly on the export market, the Thai market itself has consistently been expanding. Green Net (2014a) breaks down Thai consumers of organic food into 5 groups, namely families with children, the health conscious, patients, the elderly, and foreign families living in Thailand. Based on their survey in 2011, approximately 432 organic goods were sold in Thailand, 58% of which were imported. Currently, several major supermarket chains in Thailand dedicate a separate section for organic food. On the supply side, the Thai government has declared organic farming as a priority in its national agendas; although critics have cited its unsuccessful results and a lack of continuity in terms of the policy (Green Net, 2014a).

A survey by Roitner-Schobesberger, Darnhofer, Somsook, and Vogl (2008) on 848 Thai consumers revealed that they generally have positive attitudes towards organic food, as more than 80% of respondents believe that "organic farming is good for the environment" and "organic products are healthy." Those who have purchased organic products cite the positive health effects as the main reason, followed by no pesticide contamination. To provide a tool for consumers to differentiate organic from non-organic products, the "Organic Thailand" label, as shown in Figure 1, was established in 2000 by the Department of Agriculture (DOA), under the Ministry of Agriculture and Cooperatives. The producers of organic products can apply for this label, which aims to assure consumers that the products have passed the "Standards for Organic Crop Production in Thailand", as approved by the DOA. These standards are also aligned with the international standards set by the International Federation of Organic Agriculture Movement (IFOAM). They state that organic plants have to be grown naturally, cannot be genetically derived, and must not cause any environmental contamination. Organic farming methods and record keeping procedures are also laid out in the standards.

Figure 1: "Organic Thailand" label

Source: Department of Agriculture, Ministry of Agriculture and Cooperatives (2000)

Imported organic products sold in Thailand could carry different types of labels, as presented in Figure 2. Products with the "USDA Organic" label have to be certified by the United States Department of Agriculture (United States Department of Agriculture, 2014). The European Union's organic label, the "Euro-leaf" label, is required for all organic pre-packaged food which has been produced in the European Union; it can also be applied to other types of products (European Commission, 2014).

Figure 2: "USDA Organic" and "Euro-leaf" labels

Sources: United States Department of Agriculture (2014) and European Commission (2014)

There are other types of organic food labels that Thai consumers come across, with certified labels that signal the safety of the food. As shown in Figure 3, the Ministry of Public Health introduced the "Pesticide-safe" label in 1999, whilst the Ministry of Agriculture and Cooperatives launched the "Hygienic Food" and "Safe Food" labels in 1983 and 2003, respectively (Green Net, 2014b). The Pesticide-safe label focuses on residual chemical substances on fruits and vegetables, which cannot exceed the threshold levels set by the Ministry of Public Health or the Codex (international food standards) (Ministry of Public Health, 2014). The "Hygienic Food" label was initiated as a pilot project, and is now integrated into the "Safe Food" label (Roitner-Schobesberger et al., 2008). Food products with the Safe Food label have to adhere to the standards set by the National Bureau of Agricultural Commodity and Food Standards, which comes under the Ministry of Agriculture and Cooperatives.

Figure 3: "Pesticide-safe", "Hygienic Food", and "Safe Food" labels

Source: Roitner-Schobesberger, Darnhofer, Somsook and Vogl (2008)

In the past years, when the certification of organic products was carried out on a voluntary basis, certain producers in Thailand chose to report that their products are organic, without affixing any certified labels. Green Net (2014c) reported that approximately 91% of the organic products it surveyed that were sold by 16 retailers in Thailand during 2011, were actually certified (17% of those being Thai labels). The remaining 9% had no certification labels. In addition, such self proclamations had been expanded to cover other qualities, such as being chemical free, having no genetic modifications, or naturally fed qualities. This led to lower creditability of certified labels, since it had been reported publicly that certain certified products could also be contaminated. Government officials had admitted that 40% of the vegetable samples were contaminated with prohibited chemicals, that were beyond the standard thresholds, and yet some of those samples were affixed with the Safe Food label (ThaiPBS, 2012). A sample test by Thailand Pesticide Alert Network (Thai-PAN) in 2012, an NGO, discovered that chemical residuals could still be found on house brand vegetables, and on vegetables affixed with the Safe Food label.

Although certified organic food seems to be the safest choice for consumers, many do not actually purchase them. Results from the previous survey show that a majority of Thai consumers (51%) did not know the meaning of organic (Roitner-Schobesberger et al., 2008). Whilst 39% stated that organic food was not worth its price, 29% claimed that it was simply too expensive. The price survey of organic food sold in Bangkok in 2005 showed that organic vegetables carried approximately 100% to 170% price premiums, but the premium could be as high as 400% for certain vegetables (Roitner-Schobesberger et al., 2008). A survey carried out by the research's authors at a major supermarket in Bangkok in 2012 found that price differences between non-labeled products, Safe Food products, and Organic Thailand products varied depending of the types of the products, as presented in Table 1. It should be noted that price differences could also be attributed to the different brands and in their qualities, especially for pre-packaged food.

Table 1: Premiums for organic products and products with Safe Food label

	Premium for Safe Food Label	Premium for Organic
Corn	32%	69%
Egg	26%	40%
Salad Dressing	N/A	28%
Cereal	N/A	28%
Milk	N/A	447%
Rice	N/A	37%
Coconut Oil	N/A	6%

The purpose of this study is to quantify Thai consumers' willingness to pay for organic food, including certified and noncertified food. Since Thai consumers have several types of labels to choose from, their reactions to those labels could carry important business and policy implications. Currently, several local farmers are reluctant to switch to organic farming, due to its lower returns particularly during the first few years. Cost-benefit analysis can be better implemented when consumers' demands have been fully studied. As for policy makers, the results of the study would provide a better understanding on how Thai consumers respond to the certification of organic food. A comparison can also be made against other types of certified food labels, most notably the Safe Food label. In addition, this study also explores the importance of knowledge about organic food and organic certification on consumers' willingness to pay. To the authors' knowledge, there has been very little research in Thailand which specifically focuses on this area, although several studies have been conducted with consumers from other countries.

LITERATURE REVIEW

According to Nelson (1970), for the products to have the "search" attributes, consumers have to be able examine their qualities prior to the purchase. As a result, the search products' valuations can be determined at a small cost. As for the "experience" products, their qualities are assessed and their valuations are measured only during or after the consumption; therefore, most services can be considered experience goods. Darby and Karni (1973) added the "credence" quality, where its assessment is difficult prior to, during, or after the consumption. Food products which focus their qualities on naturalness or healthiness could be classified as credence goods (Grunert, Bredhal, and Brunsø, 2004; Poelman, Mojet, Lyon, and Sefa-Dedeh, 2008). Consumers have to form an expectation about the credence goods' qualities and look for available "cues"; but unfortunately, the confirmation of those qualities could still be limited even after consumption.

Consumers' trust is particularly crucial for products that possess credence attributes (Janssen and Hamm, 2012). Due to asymmetric information between consumers and producers of credence goods, producers have an incentive to be dishonest, which eventually could jeopardize consumers' trust (Darby and Karni, 1973). Certification by an independent party is a means of obtaining and maintaining consumers' trust (Golan, Kuchler, and Mitchell, 2001; Roe and Sheldon, 2007). This involves the whole process of setting standards, certifying the products, and enforcing such standards; whilst the independent party itself has to be accredited by the authority. Certified organic label serves this purpose and signals consumers at the point-of-sale where they have to make the purchase decisions. To test whether a product has credence quality, researchers can compare consumers' willingness to pay for the product that has a specified credence quality, to an identical product without that quality. Higher price premiums confirm the existence of credence characteristics. Several methods can be employed to elicit consumers' willingness to pay, ranging from asking consumers directly to state their preferences or letting consumers make actual choices in an experimental setting.

Surveys are a tool widely employed by researchers, in order to elicit consumers' attitude and willingness to pay for organic products. Govindasamy and Italia (1999) conducted a survey on 291 consumers at grocery retailers in New Jersey, during March 1997. With a 10% price premium as a reference in the questionnaire, the results showed that 46% of the respondents were willing to pay less than the 10% premium. And whilst 35% were willing to pay higher than 10%, the remaining 19% were indifferent between organic and non-organic products. Another recent survey on US consumers was conducted in Ohio by Batte, Hooker, Haab, and Beaverson (2007). The researchers examined the demand differences amongst four levels of organic content, which are specified by National Organic Program (NOP) guidelines. They surveyed 199 shoppers from traditional grocery stores and 102 shoppers from natural food stores. Consumers were willing to pay the highest premium for 100% organic content food, and lower premiums for lower organic content levels. In addition, shoppers from traditional stores were willing to pay substantially lower premium for organic foods than specialty store shoppers.

Consumers from other countries have also been asked to state their willingness to pay for organic products. A survey conducted on 202 consumers in Turkey showed that consumers gave a 36% price premium to products with organic labels (Akgüngör, Miran, and Abay, 2007); and a survey on 164 Greek consumers revealed that there were significant differences in willingness to pay for organic products, depending on the types of food (Krystallis & Chryssohoidis, 2005). Sanjuán, Sánchez, Gil, Gracia, and Soler (2003) classified Spanish consumers into segments based on their lifestyles. The researchers found that consumers' willingness to pay varied across different products and different segmentations. Certain studies have dedicated their attention to demographic influences on the demand for organic goods. One example is Ureña, Bernabéu, and Olmeda (2008) whose survey results pointed out that although female consumers had a more positive attitude towards organic food than male consumers, male consumers were willing to pay higher premiums.

Whilst respondents to questionnaires may have had to state their willingness to pay based on hypothetical products, several researchers have preferred to utilize the experimental design, in which actual products are employed. In addition, since participants in the experiment have to make a tradeoff between the endowed money and the products used in the experiment, this real economic incentive is expected to reduce any potential bias when it comes to making a decision. Under the so-called choice experiment methodology, Olesen, Alfnes, Røra, and Kolstad (2010) asked 115 consumers from southeast Norway to choose amongst different packages of salmon fillets under conventional, organic, and "Freedom Food" labels. The results showed that, compared to the conventional salmon of the same color, consumers gave approximately a 15% price premium to organic salmon. Van Loo, Caputo, Nayga Jr., Meullenet, and Ricke (2011) conducted an online survey on 976 consumers in Arkansas, the United States; and asked them to choose a pound of chicken breast, with different prices and labels. Generally, consumers were willing to pay approximately 35% and 104% premiums to uncertified and certified USDA organic labels, respectively. Demographic variables also played an important role in influencing consumers' willingness to pay. In Janssen and Hamm (2012)'s choice experiments,

consumers from the Czech Republic, Denmark, Germany, Italy, Switzerland, and the United Kingdom were presented with real apples and eggs. Both products were affixed with EU, government, private, and self-proclaimed organic labels. The willingness to pay results varied significantly according to the types of organic label and the country.

Experimental auction is another methodology that researchers could employ to elicit consumers' willingness to pay. Although the auction mechanism does not have the appeal of the real market setting, its theoretical support is that it has the ability to truthfully reveal participants' demand. Bernard, Chao, and Gifford (2006) focused on 82 participants from northern Delaware, who were recruited to bid for conventional, non-GM, and organic bags of chips and bars of chocolate. The experiment was based on the second-price auction, in which the highest-bid participant won the product but paid the price of the second highest bidder. This auction technique was also employed by Napolitano et al. (2010); in their study subjects from Italy showed a higher willingness to pay for organic beef, compared to the suggested market price. Utilizing the Becker-DeGroot-Marschak (BDM) bidding technique, Didier and Lucie (2008) recruited French consumers to participate in an experiment which involved chocolate bars affixed with organic and "Fair Trade" labels. Based on the BDM mechanism, each participant submitted a proposed price for the product, and participants whose offered prices were at least higher than the randomly selected selling price were awarded the product. Excluding a consumer segment which was insensitive to the two types of label, the remaining consumers offered price premiums of approximately 20% for products with the organic label.

While there are several studies on organic product acceptance and willingness to pay, very few studies have focused on consumers from other regions than the United States and Europe. A few notable exceptions include studies by Aryal, Chaudhary, Pandit, and Sharma (2009) on Nepal and Ara (2003) on the Philippines. The first study was based on a survey of 180 consumers, which revealed an overall premium of 30% on organic products, depending on the type of product; whilst the latter was based on the choice experiment methodology and focused only on organic rice.

EXPERIMENAL PROCEDURE

In this study, the random *n*th-price auction was adopted to elicit consumers' willingness to pay for organic food in Thailand. The technique was proposed by Shogren, Margolis, Koo, and List (2001), and it has the advantage of discouraging bids which are remotely below or above the market price. With the random *n*th-price auction, the number of winners is not fixed, but instead depends on the randomly drawn number of *n*, which ranges from 2 to the total number of bidders. The winners are those who bid higher than the n^{th} bidder's bid. Studies by Rousu, Huffman, Shogren, and Tegene (2004), VanWechel, Wachenheim, Schuck, and Lambert (2003), and Huffman, Shogren, Rousu, and Tegene (2003) also relied on this demand revealing mechanism.

For illustration, suppose there are 12 participants joining an auction, in order to bid for a particular product. It should be noted that this is not an auction for a single unit of the product, but that there are sufficient units of the same product for the winners. After the product is presented, and participants are allowed to inspect it, each participant has to submit his or her bidding price in a sealed envelope. The experimenter then collects all the bids simultaneously, and ranks them in ascending order. However, instead of the highest bidder being declared the winner, the winners of the random *n*th-price auction are determined by a randomly selected number *n*, which ranges from 2 to 12 in this example. If number 5 is randomly picked to be the *n*th-price, then the 4 highest bidders are declared the winners of this auction and all of the winners have to purchase the product at the price of the 5^{th} highest bid. Winners are not required to pay their original bidding prices, in order to ensure that there is a surplus (the bidding price minus the paying price) remaining to each winner. In addition, since winners are not limited to being only the highest bidder, even participants whose willingness to pay are markedly lower than others could have a chance to win. The bidding prices serve as indications of participants' willingness to pay for the product.

The experiment took place at Mahidol University International College, Thailand. Posters requesting representative Thai consumers to participate in the experiment were posted at several public areas around the campus. Interested applicants were informed that they would be participating in a food product experiment, but the actual purpose of the experiment was concealed. A total of 72 participants were eventually recruited, and each received a monetary incentive of 500 Baht.

The average age of the participants was 33.7 years, and a majority (78%) of them were female. 88% of the participants had at least a bachelor's degree education, and their average income per month was mostly between 10,000 Baht to 25,000 Baht. The recruitment of subjects was based on a voluntary basis, so participants in this experiment did not represent the general Thai population. In fact, the participants were biased towards female, educated, and high income consumers. However, females represent about 51% of the general Thai population, where 86% of whom have not obtained higher education qualifications, and more than 80% have an average monthly income of less than 10,000 Baht (National Statistical Office, 2006). The available budget posed a challenge for the researchers to recruit additional representative Thai consumers. Moreover, since certain demographic characteristics could influence consumers' decisions for health-related or environmental products, any interpretation of the results has to take these limitations into consideration. Additional studies with larger sample sizes are needed to confirm the findings.

The experiment was broken down into 6 sessions, with 12 participants assigned to each session. Every session was conducted using the same procedure. First, each participant had to randomly select an identification (ID) from A to L, in order to hide their true identities. Participants were given privacy when making bidding decisions, each of them were seated separately in their own cubicles. All 6 sessions consisted of 6 rounds of auctions, as presented in Table 2.

Table 2: Rounds of the experiment

Round	Detail
Trial 1	Auction for salt
Trial 2	Auction for sugar, soy bean, and coffee
Actual 1	Auction for rice, carrots, and eggs; affixed with normal labels
Actual 2	Auction for rice, carrots, and eggs; affixed with "Safe Food" labels
Actual 3	Auction for rice, carrots, and eggs; affixed with noncertified organic labels
Actual 4	Auction for rice, carrots, and eggs; affixed with "Organic Thailand" labels

The purpose of the two trial rounds was to make participants familiar with the auction. Participants were presented with the actual food items in all 6 rounds. They had approximately 10 minutes in each round to decide on the bids. All the bids and the winners (IDs) were publicly announced in both trial rounds. Participants were encouraged to ask questions regarding the bidding process before the beginning of the actual rounds. For each of the four actual rounds, researchers simultaneously handed out 3 bags of food products namely, rice, carrots, and eggs, which are considered basic food products consumed by typical Thai consumers. The weight of the rice, carrots, and the size of the eggs used in the actual rounds were carefully controlled, in order to ensure that the only differences in all of the rounds were the food labels. All the food products were re-packaged in clear plastic bags with newly constructed labels; each label showing basic information about the product namely, the name of the food product, weight, and the expiry date. The "Safe Food" label and the "Organic Thailand" label had their respective logos attached at the bottom of the normal label. The noncertified organic label self proclaimed that their food products were organic. It should be noted that the sequences of the 4 actual rounds were also randomly assigned. Participants were also informed that one of the actual rounds would be chosen at random for the actual exchange of food products. Winners of the selected round had to use the endowed money to purchase the food products at the price of the n^{th} bidder. Participants were asked to state the benefits of organic food in an open ended questionnaire, after the end of the auctions.

As not all Thai consumers are expected to be aware of the meanings of the certified labels due to insufficient public relation activities on the policy makers' side, it is believed that such information could sway consumers' decision making. In order to test such a hypothesis, half of the participants (participants in sessions 4 to 6) were given additional information about the meanings of the "Safe Food" and "Organic Thailand" labels, prior to the bidding process. As such, participants in sessions 1 to 3 were classified as "uninformed" consumers, whilst participants in sessions 4 to 6 were classified as "informed".

Each participant's statement of his or her willingness to pay for each product under different labels provides the raw data for this study. For each label, the average bidding price from all participants is calculated. Then, comparisons of the average bidding prices under different labels can be made. It is hypothesized that the labels that signal food safety will receive premiums over plain normal labels. With its signal of credence quality, the certified organic label is expected to receive the highest average bidding price, whilst the normal label serves as a benchmark. Knowledgeable consumers should respond positively to the organic label by assigning higher premiums, relative to consumers who do not possess such information. Again, comparisons between the average bidding prices of informed and uninformed consumers can be conducted.

RESULTS

The results for all three food products show the same bidding pattern, in which the highest average bid price was for food with a certified organic label, followed by the Safe Food label, and the noncertified organic label; whilst the normal label received the lowest willingness to pay for all products, as presented in Table 3. Compared to the normal label, the price premiums from having the certified organic label were 28%, 29%, and 17% for jasmine rice, carrots, and eggs, respectively. Although the noncertified organic food received a positive response from consumers, its premiums were notably less than the ones with certification. In addition, the Safe Food label commanded premiums of between 10% and 20%, relative to the normal label.

Table 3: Average bidding prices and price premiums over the normal label

Product	Normal Label	Safe Food Label	Noncertified Organic Label	Organic Thailand Label
Jasmine rice	32.03 Baht	38.53 Baht	34.43 Baht	41.11 Baht
% Premium	N/A	20.29%	7.49%	28.35%
Carrots	12.53 Baht	14.01 Baht	13.88 Baht	16.11 Baht
% Premium	N/A	11.81%	10.77%	28.57%
Eggs	30.47 Baht	33.60 Baht	32.63 Baht	35.53 Baht
% Premium	N/A	10.27%	7.09%	16.61%

To confirm the price differences; statistical tests were employed, and the results are presented in Table 4. The paired t-test measures each participant's bids under different labels. For all food products, the certified organic label was perceived to be different from other food labels. The self-reported organic food did not statistically add additional value to the product, since consumers did not give it the same valuation as they did to the certified organic food; but viewed it similarly to the normal label, particularly in the case of carrots and eggs. The Safe Food label, however, seems

to be effective in differentiating itself from the normal label, as consumers placed higher valuations on this label relative to the normal label. These statistical results confirm similar findings in other countries in which organic food has credence quality. Thai consumers appear to place their trust in the certified Organic Thailand labels, as guaranteeing that the food is truly organic. The Safe Food label also shows similar effects.

Table 4: Paired t-test statistics from average price comparisons

	Rice	Carrot	Egg
The "Organic Thailand Label" and the "Normal Label"	5.859*	5.031*	6.509*
The "Organic Thailand Label" and the "Safe Food Label"	2.289*	4.500*	3.050*
The "Organic Thailand Label" and the "Noncertified Organic Label"	4.003*	4.750*	3.063*
The "Noncertified Organic Label" and the "Normal Label"	–2.224*	–1.157	1.228
The "Noncertified Organic Label" and the "Safe Food Label"	2.388*	2.079*	2.259*
The "Safe Food Label" and the "Normal Label"	4.575*	2.262*	3.463*

Note: * P-value < 0.05

Table 5 presents the percentages of consumers whose bids were higher, the same, or lower, when comparing bids for the normal label and the certified organic label, and bids for the noncertified and certified organic labels. Consumers who have a positive attitude towards organic food would be expected to raise their bids for certified organic food, and the results show that a majority (72% to 76%) of Thai consumers favored organic food. Whilst 12% to 14% of consumers saw no difference between organic and nonorganic food, 11% to 14% had a negative attitude towards organic food, as evidenced by their lower willingness to pay. It should be noted that this study's scope was not to explore reasons behind such negative attitudes. Regarding the effectiveness of organic certification, Table 5 points out that more than 60% of consumers placed higher valuations on the certification. Whilst, 21% to 25% of consumers placed the same willingness to pay for noncertified organic food as they did for certified ones, 11% of consumers of jasmine rice and 18% of consumers of carrots and eggs gave higher premiums to sellers' self proclamation than they did to the government's certification. The Safe Food label is an effective means of differentiating between the products, as more than half of the consumers recognized and placed higher valuations on it, as presented in Table 5. The Safe Food label worked better with rice and eggs than it did with carrots. However, many consumers did not perceive the Safe Food label to be that different from the normal label, and some actually devalued food affixed with that label.

Table 5: Comparison of bidding behaviors between different labels

Normal and Certified Organic	**Increasing Bids**	**Indifferent Bids**	**Decreasing Bids**
Jasmine Rice	73.61%	12.50%	13.89%
Carrots	72.22%	13.89%	13.89%
Eggs	76.39%	12.50%	11.11%
Noncertified and Certified Organic	**Increasing Bids**	**Indifferent Bids**	**Decreasing Bids**
Jasmine Rice	63.89%	25.00%	11.11%
Carrots	61.11%	20.83%	18.06%
Eggs	61.11%	20.83%	18.06%
Normal and Food Safety	**Increasing Bids**	**Indifferent Bids**	**Decreasing Bids**
Jasmine Rice	63.89%	16.67%	19.44%
Carrots	54.17%	27.78%	18.06%
Eggs	63.89%	20.83%	15.28%

Comparing average bids between the normal label and the certified organic label could be misleading, since some consumers were indifferent, or against, organic food. Considering only those who bid higher for the certified organic label, the average premium was notably higher at 16.89 Baht, and 52.73% in the case of jasmine rice. On the contrary, consumers who bid lower for the organic food (14% of consumers) gave an average discount of 21% for jasmine rice. As presented in Table 6, when only consumers who had a positive attitude towards organic food are included, the premiums are higher than those presented in Table 3. Although those who bid lower for organic food gave steep discounts, particularly for carrots, their share represented only a small proportion of the market.

Table 6: Comparison of bidding behavior between the certified organic label and the normal label

	Average Premium, for Only Increasing Bids	**Average Premium, for Only Increasing Bids**	**Average Discount, for Only Decreasing Bids**	**Average Discount, for Only Decreasing Bids**
Jasmine rice	16.89 Baht	52.73%	6.83 Baht	21.32%
Carrots	6.02 Baht	48.04%	5.50 Baht	43.89%
Eggs	7.27 Baht	23.86%	4.50 Baht	14.77%

It is to be expected that consumers may not have prior background on different organic food labels, and such knowledge could potentially sway their decisions. Table 7 presents comparisons between bidding behaviors of uninformed and informed consumers. Those who were given the information about the meaning of organic food and the certified organic label, on average, bid higher than those without such information. Although this knowledge premium ranges from 18% to 26%, statistical tests show that only in the case of eggs are the average prices statistically different, as shown in Table 8. Similar behavior was observed with the Safe Food label, where those with information bid more than 22% on average for the same food product, however, only eggs showed significant statistical test results. It should be noted that informed consumers do not perceive any difference between the certified organic label and the Safe Food label, as evidenced by similar average bidding prices for all three food products.

Table 7: Comparisons between uninformed and informed bids for the certified organic label

Certified Organic	**Uninformed**	**Informed**	**Percentage Change**
Jasmine Rice	37.31 Baht	44.92 Baht	20.40%
Carrots	14.75 Baht	17.47 Baht	18.44%
Eggs	31.50 Baht	39.56 Baht	25.59%
Safe Food	**Uninformed**	**Informed**	**Percentage Change**
Jasmine Rice	34.70 Baht	42.36 Baht	22.07%
Carrots	12.33 Baht	15.69 Baht	27.25%
Eggs	29.14 Baht	38.01 Baht	30.44%

Table 8: Paired t-test statistics from average price comparisons

	Rice	**Carrot**	**Egg**
Informed and Uninformed Consumers, for Certified Organic Label	1.486	1.337	2.213*
Informed and Uninformed Consumers, for the Safe Food Label	1.735	1.916	2.603*

Note: * P-value < 0.05

CONCLUSIONS AND IMPLICATIONS

The results from the auctions reveal that Thai consumers generally have positive attitudes towards organic food. More than 70% of consumers are willing to pay additional price premiums for organic food, relative to nonorganic food. The premiums vary, from 17% for eggs, 28% for rice, and 29% for carrots. In addition, the results from the questionnaire survey show that 35% of consumers view organic food as chemical free, whilst 21% consider them as having higher nutritional benefits compared to nonorganic food. Focusing on the demand side, market opportunities exist in Thailand for organic food producers. This is especially true if we exclude consumers who are indifferent and those who are against organic food. When only increasing bids for organic food are included, price premiums rise significantly to 53% for rice, 48% for carrots, and 24% for eggs. From the Thai consumers' perspective, organic food is clearly a premium food.

Organic food is confirmed as having credence quality, where its determination and measurement cannot simply be made prior to or after purchase. Experimental results show that there is sufficient trust in the certified organic label, Organic Thailand, which is viewed as third-party verification. Thai consumers recognize the certified organic label, and place a higher valuation on products with such labels, compared to self-proclaimed organic food. Looking at the policy implications, the value of organic certification has to be communicated to organic food producers, so that they will choose to voluntarily apply for it. Admittedly, many consumers do not have prior knowledge about the meaning of certification. However, the bidding results show that such information could actually translate into higher prices. This is especially true when we focus on the bidding results of informed consumers for organic food. Consumers who possessed the knowledge about organic certification, gave premiums of 30% to 40%, compared to the average bids for nonorganic food. However, policy makers should be concerned that consumers' trust in certified labels can easily be broken when there are incidents of mislabeling and proven fraud amongst producers. Therefore, close monitoring processes and regular inspections have to be implemented.

Two cautionary points can be drawn from the experimental results. Firstly, although consumers generally differentiated between the certified organic label and the Safe Food label; when the information about both labels was communicated, the bidding behaviors were quite similar. A policy of food labels has to be unified and unambiguous, regarding the qualities of both labels. It could be speculated that if the Safe Food label is less costly to obtain, it could jeopardize the value of organic certification in the future. Both the Safe Food label and the Organic Thailand label have to be clearly set apart and publicly communicated. Secondly, the experimental results show that almost 30% of consumers still do not favor organic food. On a broader perspective, it means that the benefits of consuming organic food have to be effectively communicated to the general public. Further studies should explore the reasons behind the rejections.

From the perspective of the producers and retailers, based on a survey of the actual prices of organic food in a major supermarket chain in the Bangkok area, the price premiums of most organic food are 30% above those of nonorganic food. Comparing these findings to the results from the experiments, it seems that the market prices have been set in accordance to consumers' willingness to pay, except in the case of organic eggs. However, this comparison has to be interpreted with caution, since the average premium of 53% (in the case of jasmine rice) does not mean that all consumers are willing to pay such high premium. When the list price is fixed, many consumers may decline to purchase organic food; and in order to expand the market opportunities, prices may have to be adjusted lower. The issue also depends on the supply side, particularly the costs of organic farming, and by how much prices can be lowered.

In order to focus on the role of the food label, this experiment has excluded other important products' quality signals namely, brand and packaging. In the actual market, brand undoubtedly plays an increasing important role in the food industry, and is usually promoted alongside the food products' attributes. At present, food producers who would like to focus on the organic quality as its differentiation could start with the organic certification, in order to obtain consumers' trust. In the future, producers should keep in mind that organic certification could be just a necessity, but not a selling point. Several food manufacturers and retailers in the Western countries, where the market opportunities for organic food are sufficiently large, have chosen to be associated to organic content. Notable example is the Whole Foods Market, whose retailing business in the United States, United Kingdom, and Canada, has its specialization on natural and organic products (Whole Foods Market, 2015). Due to the pressure from consumers, several food-related companies have committed to produce or sell only food with has no genetically modified organism (GMO) for examples, Marks and Spencer, Tesco (in the United Kingdom), Carrefour (in France), and Nestle (in Switzerland) (Giannakas and Fulton, 2007).

This study is limited in terms of the sample size due to the nature of the experimental methodology. Moreover, the sample is biased towards female and highly educated Thai consumers. As a result, although high-income earners could potentially be the target market for organic food sellers in Thailand at this stage, the results presented here should not be generalized to the entire Thai consumers. Further studies using larger and more representative samples are certainly needed to confirm the findings.

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