Consumer preference of rice-based products: cross cultural study between Thailand and Australia

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This survey was conducted to compare attitudes between Thai consumers toward rice-based products and Australian consumers, to obtain ideas that should be developed high potential rice-based products for each country. The standard questionnaire used in both countries consisted of four sections on face-to-face interviewing on demographic, personal, attitudinal and preference rating data. 100 respondents from each country participated in this study. Comparison of qualitative data from demographic, personal, attitudinal profiles and quantitative data from preference rating data shown on preference maps between Thais and Australian consumers showed differences between culture in both countries. Australian consumers have their own food habits adapted from both western and Asian cultures. Meanwhile, Thai consumers showed only Thai or Asian style of their food habits. However, the new generation of Thai consumers (10-24 years of age) have Western style of rice-based products like Australian consumers. The results from each country can help food product developers to develop new rice-based products more successful in both countries.

Key word: cross cultural study, consumer preferences, rice-based product,

Introduction

Cultural differences in food preference relate to consumer characteristics such as nationality, religion, race, age, sex, education and socioeconomic status and these factors form the basis of consumer attitudes, motivation and behavior. With the internationalization of the food industry, it is important to study these relationships in some depth in order to introduce new products into the market. This study aims to compare consumer preferences for a range of rice-based products between Thai and Australian consumers.

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In this study measures of demographic profile and preference mapping are used in an attempt to uncover cultural differences between consumers form the two countries so that the food industry can respond to the individual needs of each group of consumers.

Cross-cultural studies in food have been carried out for a long time: Grunert (1997) reported a cross-cultural study using an extended form of conjoint analysis on the quality perception of beef in a purchase situation in 4 European countries (France, Germany, Spain and the UK). It was found that the most important purchasing motives in all 4 countries were tradition, food security, variety, social life, health, acceptance, nutrition, cooking ability, and status. Monteleone *et al*. (1998) who studied the influence of demographic factors and attitudes on personal preferences also reported that consumers with the most traditional eating habits who lived in the Reading area of the UK tended to prefer familiar starchy foods. Prescott (1998) studied the comparisons of taste perceptions and preference of Japanese and Australian consumers and the results from this study showed few cross-cultural differences in perception between consumer groups and little evidence of cross-cultural influences on assessment behavior has emerged. Monoz (1998) studied cross cultural consumer studies of meat. Baxter *et al*.(2000) reported that socioeconomic background influenced perceptions, while self-reported consumption was significantly affected by social background, age and gender of children in Scotland when studying their perceptions of common vegetables. Jaeger (2000) used choice-based conjoint analysis to study cultural differences in sliced apple products of an individualists culture (New Zealand) and a collectivist culture (Samoa). It was report that there was no effect on choice of targeting (you vs. the family) or characterizing (new vs. traditional) of the product. Murray *et al*. (2001) reported the investigation of food product attributes that may influence perception of and preferences for snack food by consumers of Australian or Chinese origin. This study used two sensory/consumer research techniques (sensory preference mapping and free choice profiling) by 2 types of consumers. It was also reported that Chinese consumers were found to use more words than Australians to describe snack food attributes and were more discriminating in their sensory properties. This study concluded that preference mapping is the best approach for determination of the ideal formation of a product, but that free choice profiling may be a better method to gain an understanding of consumer perception and description for marketing purpose.

All studies above show that some studies using preference mapping have been used to compare preferences of consumer group from different cultures for many foods. This study intends to uncover the differences in consumer preferences from both countries (Thailand and Australia) for rice-based products. Qualitative methods using consumer interviewing with standard questionnaires will be used as well as quantitative methods (rating scores of consumer preferences) to build internal preference maps.

Methodology

Collection of commercial rice-based products in Thailand and Australia

A number of supermarkets and superstores in both Thailand (Bangkok and Khon Kaen) and Australia (Brisbane, Queensland, Australia) were visited and inspected. Some of these available in both countries, highly accepted and familiar products by both consumers (n = 10) were purchased and taken back to the laboratory.

Eight rice-based products available in both countries (Thailand and Australia) (Table 1) were photographed using a 3.2-mega pixel digital camera without any signs of their brands or packages. During the consumer survey, these photographs were presented to consumers from both countries using a standard questionnaire as part of a consumer preference survey. The questionnaire was tested this questionnaire with 10 consumers to make sure it can be suitable for consumer survey.

Questionnaire development

The structured questionnaire for consumer preference of rice–based products was developed; the questionnaire consisted of 4 sections. The first section contained questions on general rice-based product consumer behaviour or consumer information such as knowledge of rice-based products, product consumption and frequency of consumption.

The second section contained questions relating to product preference. Nine–point liking scales were used to measure preference toward the rice–based products. The scales categories corresponded to 1 = dislike extremely, 5 = neither like nor dislike, and 9 = like extremely that each respondent used this scales categories as intensity of liking when rating the degree of liking on each rice-based products. After rating the intensity of their liking for each product,

Table 1. List of 8 rice–based products that were available in both Thai and Australian market.

No.	Product code	Rice-based products
1	P1	Frozen single dish (Khow pad)
2	P2	Rice flour
3	P3	Dried rice noodle
4	P4	Rice paper (Bi meaing)
8	P8	Rice breakfast cereal (Rice bubbles)
9	P9	Baked rice cracker
10	P10	Extruded rice cracker
11	P11	Rice cookies (Kayasart dessert)

the respondents were asked to describe their key product attributes which affected their liking score.

The third section contained questions on attitudinal data such as why consumers eat rice-based products, when they consume them, where consumers buy them and how much they pay when they purchase rice-based products.

Finally, the fourth section contained questions on general personal information of consumers such as gender, age, marital status, occupation, education etc.

Consumer survey

In Thailand, the consumer data was collected by face-to-face interviewing with the standard questionnaire by the researcher with assistance from other staffs at Khon Kaen University (KKU). The standard questionnaire contained both closed and open-ended questions which were used with a sample group of consumers (n = 100). The respondents were within the age range of 10–64 years and were selected from the municipal area of Khon Kaen Province, Thailand during November–December 2003 at a shopping center, public park, and a silk festival bazaar. Before the interview, the respondents were informed of the purpose of the study. After the interview, each participant was given a souvenir in appreciation for their support. Incomplete questionnaires were eliminated and more interviews were continued to attain the target number of respondents (n = 100).

In Australia, the researcher and staff of the University of Queensland (UQ) collected the consumer data by interviewing a sample group of consumers (n = 100) from the University of Queensland St. Lucia Campus, Brisbane, Queensland using a closed questionnaire during June–July 2004.

The respondents were within the age range of 10–71 years. Before the interview, the respondents were informed about the purpose of the study. After the interviewing, each one was given a souvenir.

Data analysis

The consumer data from both countries were analyzed using SPSS for windows, Version 11 (Analytical software, SPSS Inc.) The results from qualitative consumer data from descriptive statistic analysis were shown in forms of tables and the results from quantitative consumer data from multivariate statistic analysis were shown in figure of internal preference maps. The Hierarchical cluster analysis was a statistical technique for grouping rice based products (based on preference scores).

Results and discussion

Comparison of demographic profiles between Thais and Australians

The comparison of demographic profiles between Thai consumers (n = 100) and Australian consumers (n = 100) shows each part of the demographic profile will be discussed separately according to the specific section heading in Table 2. This information shows that the demographic factors are common between both groups; However, the consumer profiles from similar factors are different in some factors because of cultural differences.

Gender, age, marital status:

There were more female and less male respondents in the Australian respondents compared to the gender distribution in the Thai respondents. Respondents from both countries consisted of a similar age distribution. However, there were more single people in the Australian respondents than in the Thai respondents. Furthermore, more Australian respondents were categorized as separated or divorced than the Thai respondents. These results may indicate that some cultural difference will exist between the two consumer groups as single parents and female respondents are likely to have different

Table 2. Comparison of demographic profile between Thai and Australian respondents (n = 100)

Demographic Variables	Thai respondents (%)	Australian respondents (%)
ender		
Male	48	41
Female	52	59
Age (years)		
10-14	20	20
15-24	26	20
25-34	20	20
35-44	16	20
45+	18	20
Marital status		
Single	54	59
Married / De facto	46	36
Others (separate, divorce, no answer etc.)		5
Occupation		
Pupil / student	10	21
University student	13	50
Government worker/University staff	20	17
Private worker	33	4
Business owner	9	1
Other occupations (housewife, retired person, agriculturalist etc.)	15	7
Highest level of education		
Primary school	17	3
Secondary school	21	28
Professional collage	21	2
University degree study	35	31
Post- graduate degree study	4	28
Other educations	2	8
Income level per month[1]		
$\leq$ 3,000 Baht/ $\leq$ 1000 AUD	37	11
3,001 - 5,000 Baht/ 1000-1999 AUD	13	23
5,001 - 10,000 Baht/ 2000-2999 AUD	22	34
10,001- 15,000 Baht/ 3000-3999 AUD	9	5
15,001- 20,000 Baht/ 4000-4999 AUD	8	3
20,001- 25,000 Baht/ 5000-5999 AUD	4	3
25,001- 30,000 Baht/ 6000-6999 AUD	5	2
> 30,000 Baht/ 7000 up	3	2
No income		13
No answer		4

[1] $1 AUD = 30 Thai Baht

preferences compared to that of the other categories in the study. However, none of these differences were of a substantial nature.

Occupation: The Australian respondents were predominantly university students or staff with a small proportion of respondents classified as private workers. This is in contrast to the Thai respondents who were mostly from the private sector or a government position. These differences are directly related to the source of the respondents from each country but should give an indication of differences in food preferences based on these demographic factors.

Education: The educational aspect also directly reflects the source of the population in each country in that most of the respondents in Australia came from a university background.

Income level: The big difference between Australians and Thais from this study was their income level. From Table 4.2 it was found that Thai people have an income of around 100-300 AUD per month while Australians have an income around of 1000-3000 AUD per month. The difference of income was 10 times. This difference is likely to have a dramatic effect on their preferences and their willingness to buy food. Besides the income difference, some Australian respondents still answered that they have no income because they received government funds such as pensions and scholarships. However, in Thailand the old-age generation always depend on money from their children. This information may also affect their food preference.

Comparison of rice-based products knowledge between Thai and Australian consumers

Rice-based products knowing and consumption: Table 3 shows that there are some rice-based products available in Thailand, but are not available in Australia. Examples include fermented rice products, baby food and single rice dish in a can. This information shows that different cultures have different foods that have been suitable to their individual food habits. The results from Table 4.3 also shows that most Thai respondents know and eat rice-based products from local business or prepare rice-based product by themselves while Australian respondent depend on processed rice-based products from the food industry. The Australian lifestyle is a western/city style while most Thai respondent's lifestyle is more Asian local /lifestyle. when For example Thai respondents always eat rice noodle (97%), but Australians like to eat rice biscuit, rice cake and rice cracker (62%). These results indicate that rice-based products should be developed in relation to the specific of consumer lifestyle for the country of sale and not be a generic product.

Table 3. Rice – based product knowledge and consumption

Information	Thai respondents (%)	Australian respondents (%)
Rice – based products knowledge		
Rice flour	98	53
Dried rice noodles	98	66
Fermented rice products	97	ns
Rice desserts	95	67
Rice cakes/Rice biscuit/Rice cracker	91	83
Rice milk drinks	90	28
Rice snacks/Rice crisp	89	83
Rice - baby food	76	ns
Rice breakfast cereal	68	77
Single dishes in can	31	ns
Frozen single dishes	24	41
Freeze-dried single dish	ns	18
Others (Rice –based products in local/own style)	1	8
Rice – based products consumption		
Dried rice noodles	97	39
Fermented rice products	91	ns
Rice cakes/Rice biscuit/ Rice	87	62
cracker	84	25
Rice flour	83	31
Rice desserts	80	62
Rice snacks/rice crisp	65	4
Rice milk drinks	42	ns
Rice - baby food	40	46
Rice breakfast cereal	19	14
Frozen single dishes	9	ns
Single dishes in can	ns	2
Freeze dried single dish	1	13
Others (Rice–based products in local/own style)		

Frequency of rice-based product consumption and place of purchase: Table 4 shows that Thai respondents seem to eat rice-based products more frequently (2-3 times per week) than Australian respondents (once a week). This difference is likely a result of the fact that the main carbohydrate source in Thailand is rice, while the main carbohydrate source of Australians is wheat (Catharine, 1999). So Australians may be more familiar with wheat-based products than rice-based products with the reverse holding true for Thai consumers.

Meanwhile, most Australians buy rice-based products from supermarket but Thais always buy these products from many places such as convenience store, groceries near their home, supermarket shops and fresh market. Face-to-face interviewing in this study indicates that this finding may be related to the fact that most people in Thailand still have the country lifestyle and buy food at fresh market everyday while Australian consumers buy food at supermarkets once a week. Moreover, information from Table 4 shows that Thailand still has hawkers who carry foods to sell directly to consumer at their houses but in Australian there are vending machines to sell rice-based products everywhere. There differences of food dispersion and consumption between in Thailand and Australia can make food businesses think about how to manage this aspect of product development.

Table 4. Frequency of rice – based product consumption and place of purchase

Information	**Thai respondents (%)**	**Australian respondents (%)**
Frequency of rice-based products consumption		
More than 3 times per day	7	0
3 times a day	11	2
Twice a day	14	7
Once a day	11	12
Once per two days	5	8
5-6 times a week	10	8
2-3 times a week	22	20
Once a week	15	25
Less than once per week	5	14
Never	0	4
Where respondents buy rice-based products		
Convenience store	63	25
Groceries near their home	61	ns
Supermarket	55	92
Shops at fresh market	49	ns
Superstore/shopping center	46	ns
Hawker - sale man	24	ns
Shops at work place/school	23	5
Vending machine	ns	6
Petrol station store	ns	1
Others (Festival Fair, Promotion Hall, etc.)	1	4
Don’t purchase	ns	4

Where and when respondents eat rice-based products: Table 5 shows that most respondents from both countries still eat rice-based product at home. However, it was also found that some Thais eat rice-based products in a car because of traffic jam. This result should indicate that food developers should consider how to produce rice-based product suitable for eating in a car.

When considering the time when respondents from both countries eat rice-based products, it was found that one of the differences of this cultural study is Australians always think about rice based product as part of a main meal because they eat them during meal time, while Thais always think about rice-based product as snack foods because they eat them at Leisure time. This may be because Thais always eat cooked rice with many foods as a main dish so it makes them think about rice-based products as their snack.

Table 5. Where consumers eat rice – based products

Information	Thai respondents (%)	Australian respondents (%)
Where consumer eat rice-based products		
Home	93	98
Restaurant	72	50
Car	70	9
Party	65	32
Work place/school	59	34
Shopping center	52	17
Movie	48	7
Hospital	28	4
Others (Park, Farm etc.)	15	1
When consumers eat rice- based products		
Leisure time	79	33
On the vacation	75	16
Traveling	70	21
Watching TV	69	27
Partying	58	30
Watching movies	57	27
Afternoon tea	52	33
For guest	43	20
Working/reading	40	14
Have spare money	28	6
Morning tea	27	16
During meal times	25	72
Before/after meal	23	23
As a reward	18	5
When bored	16	10
After exercise/sport	15	10
Before bed time	11	8
Others (When sick, When allergic other foods, etc.)	3	7

Why respondents buy and eat rice-based products: Both respondent groups eat rice-based product because they are available, convenient, stop hunger, delicious and nutritious etc. Australian respondents do not eat rice-based products as a main dish because they prefer them as a snack type product. However, the consumption of rice-based breakfast cereal (rice bubble) is a main dish that Australians consume in the morning. However, 60% of Thai respondents answered that they would consume rice-based products as a main meal. This result shows that in Australia, Rice is not seen as a main food for people while in Thailand rice is a major food for Thai people. So Thai respondents were more familiar with rice when compared with Australian people.

Table 6. Reasons consumers eat rice – based products

Information	Thai respondents (%)	Australian respondents (%)
Why consumer eat rice-based products		
Easy to buy (Available)	97	49
Easy to consume (Convenience)	92	49
Stop hunger	90	49
Delicious	86	51
Nutritious	79	51
Easy to prepare	73	58
Instead of main dish	60	13
For Energy	58	34
Habitual eating	51	27
Fun	39	14
Preventing vehicle sickness	32	1
Sociability	27	7
Others (It is cool, add their performance)	4	9
Why consumes buy a new rice-based product		
Delicious	83	84
Nutrition or health promoting properties	72	61
Not expensive	67	71
Advertisements (any media)	39	27
Premium and specialties offered by company/shop	30	18
Product appearance	25	54
Attractive packaging	21	26
Others	2	11

How much do respondents prepare to pay a new product: The difference between the Australian income and Thai income was around 10 times. This means that there is a completely different market between respondents from the two countries. Most Thai respondents were prepared to pay 11-25 Baht or around 0.3-0.7 AUD, but most Australian respondents were prepared to pay around 3-4 AUD. This is interesting for rice-based product businesses to think about how to code their product price in both countries.

Table 7. How much consumers prefer to pay a new rice-based product.

Information	Thai respondents (%)	Australian respondents (%)
How much consumer prefer to pay a new rice-based product	12	
≤ 10 Baht[1]/ ≤ $1 AUD	43	4
11-25 Baht / $ 1-2 AUD	30	10
26-50 Baht / $ 2-3 AUD	8	21
51-100 Baht / $ 3-4 AUD	7	24
101-200 Baht / $ 4-5 AUD		12
/ $ 5-6 AUD		8
/ $ 6-7 AUD		0
/ $ 7-8 AUD		0
/ $ 8-9 AUD		2
/ $ 9-10 AUD		1
Others (Depend on what it is, Depend on how big, Depend on quality of products, etc.)		18

[1] $1 AUD = 30 Thai Baht

The comparison of consumer preferences between Thai and Australian consumers

Some rice–based products however are both available in Thailand and Australia, but consumer preferences of each country on them may be different. When the preference data was analyzed for the same 8 rice–based products (Table 1) from the consumer survey in Thailand (n = 100) and Australia (n = 100), it was found that in Table 8 there were 2 principal components which have an eigen value ≥ 1 and it could describe most consumers from both countries (49.688% of variance). The results were used to construct only one internal preference map (Figure 1). Cluster analysis was then used to cluster 8 rice–based products and it was found that they were grouped in to 3 groups or 3 clusters which are shown in the same map as below (Fig. 1).

Table 8. Principal component analysis of Thai and Australian data

Component	Initial Eigen Values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	2.087	26.092	26.092	2.087	26.092	26.092	2.085	26.063	26.063
2	1.888	23.596	49.688	1.888	23.596	49.688	1.890	23.625	49.688
3	.988	12.354	62.043						
4	.885	11.060	73.103						
5	.645	8.060	81.163						
6	.587	7.334	88.497						
7	.488	6.101	94.598						
8	.432	5.402	100.000						

Extraction Method: Principal Component Analysis.

Figure 1 shows that there were 2 preference dimensions from the consumer data from both countries. Preference dimension **1** (26.063% of variance) may be called Thai-style preference dimension. When using internal preference map from Figure 2 to explain the result, it was shown that most Thai respondents (“T”) like the products in this dimension such as rice flour (p2), dried rice noodle (p3), rice paper (p4), rice cookies (p11), and all of them were in cluster 1.

The other preference dimension 2 (23.625% of variance) may be called Australian-style preference dimension because most Australian respondents (“A”) like the products in preference dimension 2 such as frozen single dish (p1), rice breakfast cereal (p8) and all of these products were in cluster 2. All products in this cluster were also related to the Australian life style.

Sometimes, the cultural resistance to new product development is too great. Like the results of this study, it was show that almost of Thai consumers did not like rice breakfast cereal (p8) that was very poplar in Australia and the growth of ready–to–eat cereal in Thailand was slow because the cereal did not fit into the breakfast eating pattern of Thai cultural. Steamed rice, fried rice, and rice porridge were common at Thai breakfast, often eaten with pork, fried egg or a savory sauce (Earl *et al*., 2001).

However, there were some rice-based products that were liked by some respondents from both countries such as products in cluster 1 (rice flour (p2), dried rice noodle (p3), rice paper (Bi meaing) (p4) and Kayasart dessert (p11), and products in cluster 3 (baked rice cracker (p9) and extruded rice cracker (p10)). Meanwhile, considering Figure 2 shows some of mixed dots on the preference map between “T” dots and “A” dots around cluster 1 and cluster 3 of rice-based products (Fig. 1). This result from both preference maps shows that not only do food product developers produce new rice–based products that respond to consumer liking in each individual country, but they can also develop new rice–based products from cluster 1 and 3 that can be launched in both the Thai and Australia markets.

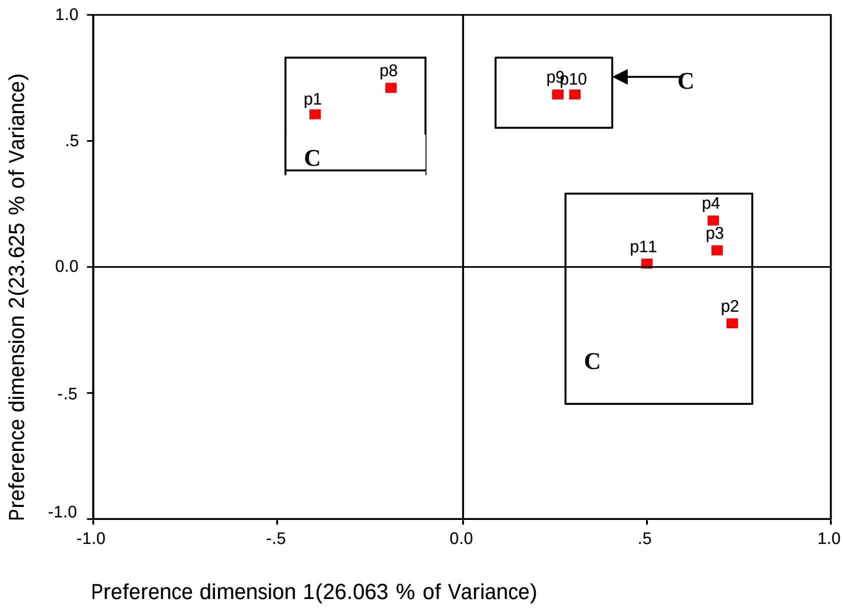

Fig. 1. Internal preference map showing product positioning of 8 rice–based products from both of Thai consumers and Australian consumers ("p#" refers to rice-based products in Table 1).

However, when considering the Australian data it was found that most Australians who like products in cluster 1 came from an Asian style families, Products from cluster1 were liked by both Western-style and Asian style Australian consumers. So if food product developers want to develop new rice-based product for mass market of Australia, they should be interested in cluster 1 that contains rice–cracker products as an example. Furthermore, rice-based cracker products of cluster 3 should be selected as a sample group for the next step study because in the Thai data, this product group was selected as well. It is good enough when doing cross cultural study with similar product.

The differences in the foods habits between consumers from both countries need to be considered by food product developers when thinking

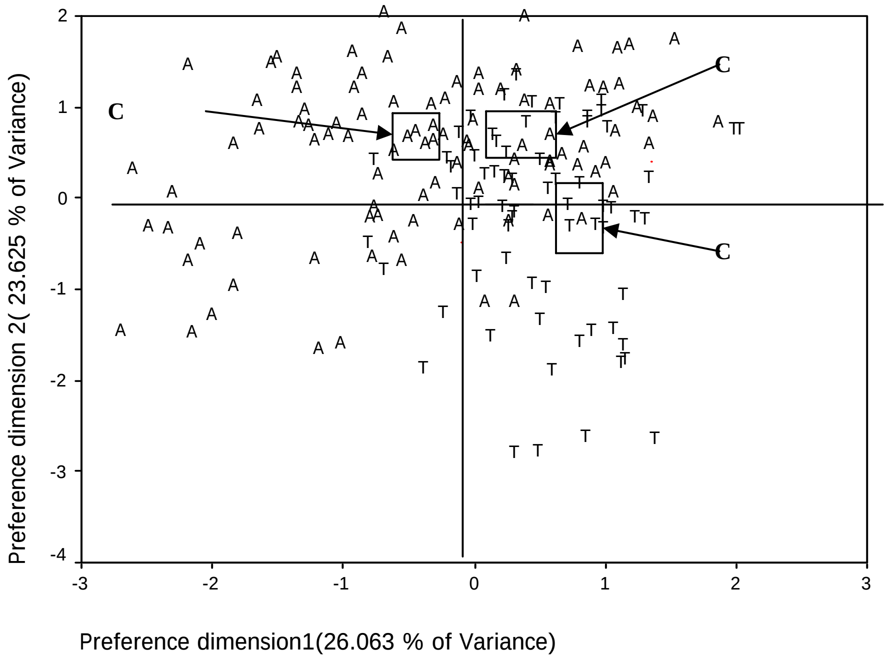

Fig. 2. Internal preference map shown preference positioning of Thai consumers and Australia consumers ("A" refers Australia consumer- preferences, "T" refers Thai consumer-preferences)

about rice-based crackers suitable for each market. For the Thai market Thai sauces and chili powder may be added to make the rice-cracker product spicier to hit the Thai people preferences. In the same way food product developer can add some seasonings powder of onion, cheese or BBQ to respond Australian consumer's preferences.

Conclusion of the study

The cross-cultural preference study between Thais and Australians using consumer survey, internal preference maps and cluster analysis can show the differences between the cultures in both countries. Both qualitative results from the demographic data, their general opinions about rice-based products shown a general characterization of both consumer groups who express different preferences to be made (Murray and Delahunty, 2000) and the quantitative results from internal referent maps showed that consumers in Australia have their own food habits that are adapted from many cultures as a result of migration from across the world to Australia over a long period of time. Most

Australian consumers have western style of food habits. However, there are some consumer groups of Asian-style in Australian and their preferences in rice-based products are similar to that of Thai consumers However, these results show that most Thai consumers show only Thai or Asian style food habits because the level of migration from the world is small when compared to Australia. The result shows only one group of Thai consumer that like rice-based cracker like the Australian group. When considering deeply into Thais' consumer preferences, it was shown that only new generation of Thai consumers (10-24 years of age) have this western style of rice-based cracker. So a rice-based product group that could be high potential to develop in both countries is Rice-based cracker which is coated with different flavorings depending on the market country.

The comparison of consumer needs between Thais and Australians by considering their profiles and consumer internal preferences maps shows some differences between both sets of results. The results from each country can help food product developers to develop new rice-based products that could be more successful in Thai market or Australian markets. Finally using consumer interviewing with a standard questionnaire and preference mapping are used in both countries.

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