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Acceptance Letter

5 January 2020

Paper Title: Impact of Nutritional Information on Consumer Healthy Food Choices

Author(s):   Sukanya Damkrut

Dear Sir/Madam,

We are pleased to inform you that your paper, based on your abstract, has been accepted for the Regional Conference on Graduate Research 2020 to be held on 18 January 2020, Sripatum University, Khonkaen, Thailand. The Committee now needs to have confirmation from you that you will be able to submit your full paper to us by 10 January 2020 and that you will be able to present your paper in a 15 minute time slot during parallel session at the Conference. The paper should be no more than 4000 words, Times Roman 12pt and single-spaced. Please confirm that you will attend the conference to present your paper, notifying us as soon as possible, and no later than 15 January 2020. If I do not have confirmation from you by 15 January 2020, your 15 minute time slot will be allocated to a reserve speaker.

We would also like you to submit your PowerPoint presentation to us by 13 January 2020 so that we can give you feedback regarding the likelihood that your presentation will stay within the 15 minutes of allocated time. A member of our Committee will be in contact with you about this after we have had confirmation that you will attend the conference to present your paper. The conference program, and final session schedule will be delivered to you by 15 January 2020 through your email address, and we are looking forward to hearing from you.

With Warmest Regards,

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RCGR 2020

Certificate of Paper Presentation

This is to certify that

Sukanya Damkrut, Wanbilai Chulaphan, Jorge Fidel Barahona Caceres and Tanchanok Bejrananda

Presented a paper on

Impact of Nutritional Information on Consumer Healthy Food Choices

The 5th Regional Conference on Graduate Research

18 January 2020

Sripatum University, Khon Kaen Campus, Khon Kaen, Thailand

Assoc. Prof. Dr. Vichit U-on
General Chair, RCGR 2020

RCGR 2020

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18 January 2020

Sripatum University, Khon Kaen Campus, Khon Kaen, Thailand
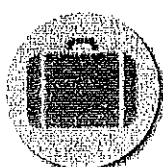
Editors:
Vichit U-on
George C. Hadjinicola

0006	16:00	16:20	Application of Geographic Information System for Monitoring Land Use Changes in Nakhonratchasima City Municipality *Yaowaret Jantakat and Pongpun Juntakut*
0008	16:20	16:40	Biological Activities and Anthocyanin Determination of Eleutherine Americana Extract *Pahol Sansomchai and Onuma Chansatein*
0009	16:40	17:00	Effect of N 2 Gas Flow Rate on Structure of Zirconium Nitride Thin Films Deposited by DC Magnetron Sputtering *Jindawan Thammapreecha and Aram Chanachot*
0023	17:00	17:20	The Development of GSP Application for Computer-Assisted Instruction of Mathematics Teaching in Quadrilateral area unit of Prathom Suksa 6 at Ban Thatum Donrua School, under Maha Sarakham Primary Educational Service Area Office 1 *Aemorn Aupata, Chakkaphan Chancharoen, and Navarat Saekhow*
0024	17:20	17:40	The Development of Applied High Speed Multiplication Techniques (Vedic Mathematics) for Computer-Assisted Instruction of Mathematics Teaching for Prathom Suksa 4 at Ban Mabo School under Maha Sarakham Primary Educational Service Area Office 2 *Phansak Uppate, Suphat Punpattanakul, and Ngamprom Onbuakhao*
0053	17:40	18:00	Impact of Nutritional Information on Consumer Healthy Food Choices *Sukanya Damkrut, Wanvilai Chulaphan, Jorge Fidel Barahona Caceres, and Tanchanok Bejrananda*

Code	Session	Chair	Room	Start	Finish
SG3	Organization and Human Resource Management	Ms.Nisarawan Piboonpornpong	Floor 2, Room 307	15:20	18:20
0021	15:20	15:40	A Study of the Relationship between Work Factors and Performance of Employees at DokKhun Industrial Group in KhonKaen and NongBuaLamphu Province *Kritchada Duangtaecha and Nontipan Prayurhong*		
0029	15:40	16:00	Correlation between Personnel Development and Competency in Operation of Government Officers and Personnel under the Court of Justice Office, Khon Kaen Province *Jirapant Raknui and Nontipan Prayurhong*		
0033	16:00	16:20	A Study of Factors Effecting to The Organizational Commitment of Vocational Teachers in Udonthani Province *Juthamat Saikeaw and Vorapon Klongcherngsorn*		
0039	16:20	16:40	Motivation Factors and Transformational Leadership Affecting Organizational Commitment of the Construction Business in Bangkok *Jirapach Pongsunont and Natsapun Paopun*		
0042	16:40	17:00	A Study of the Relationship between Work Motivation and Work Efficiency of the Court Officials in the KhonKaen District *Chanaporn Khadun and Nontipan Prayurhong*		
0048	17:00	17:20	The Cost and Compensation of Broiler Raising Nong Bua Subdistrict, Ban Fang District, Khon Kaen *Ploynaphat Nonting, Nilubon Wongwan, Areeya Sasim, Thidarat Sirima, Jirapa Sadraksa, and Phatsarawan Duangthipjan*		
0052	17:20	17:40	A Study of the Relationship between the Transformational Leadership of School Administrators and School Effectiveness under Secondary Educational Service Area Office 20 *Yuenyong Thaijaidee, Vitorn Vipahot, Vorapol Klongchengsol, and Prayad Ruechakul*		
0083	17:40	18:00	The Evaluation of Occupational Support Community Enterprise, Koh Kok Community, Rayong Province *Phatnatcha Chotkunakitti, Yodsawinkan Kobkanjanapued, Molsikarn Tripattanasit, and Ittidej Seangpuang*		
0100	18:00	18:20	A Study of the Relationship between Stress, Quality of Life and Work Efficiency of Personnel Roi-Et Area Revenue Office *Punthararat Nachaichot and Nontipan Prayurhong*		

Applied Science and Computer Technology

0053

Impact of Nutritional Information on Consumer Healthy Food Choices

RCGR 2020

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Impact of Nutritional Information on Consumer Healthy Food Choices

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Abstract

Nutrition information on food products has become a tool to communicate and educate consumers. This paper examines the link between nutrition label use and consumers' healthy food choices. There are three types of labels; Guideline Daily Amount (GDA) label, healthier choice symbol and nutrition/health claims. The results indicate that the use of nutrition information label was the most influenced consumers to buy healthier food products following by GDA label, healthier choice symbol and nutrition/health claims respectively. Future study should be targeted to consumers in other group and the factors that explain consumers' use of each nutrition labels should be considered.

Keywords: Nutrition Label Use, GDA Label, Healthier Choice Symbol, Nutrition Claims, Health Claims, Healthy Food Choice

1. Introduction

Nowadays, the world is campaigning to solve overweight, obesity and related diseases. That is a chronic non-communicable disease including diabetes, high blood pressure, cancer and chronic renal failure et cetera. And Obesity-related diseases are also a threat in the Thai population as well. From the numbers of illness and death rates from the diseases as above show that Thai people who are obese are as high as 4 million people (16 percent of the total population), which is the fifth in the Asia Pacific region (Thai Health Promotion Foundation, 2013). The problem of chronic non-communicable diseases occurs besides it is the problem directly causing trouble to patients and families. But still a continuous problem affecting the country's economy because of the expenses that

the government sector has to pay for medical treatment for patients with the diseases aforementioned by Universal Health Care Coverage Service as in 2009 that up to 5,580.8 million baht, representing 2.01 percent of the total health expenditure of the country and has a tendency to continuously increase because of medicines and medical equipment that still need to be used to treat patients continuously (Thai Health Promotion Foundation, 2013). Moreover, the large number of patients also affected the declining gross domestic product because the patient is in working age, which is the age that is the important force of the organization (The Healthier Choice Logo Certifying Unit, 2015).

The main cause of obesity is mainly from eating habits. Which people in the modern lifestyle often choose to consume fast food or food that easy to consume and comfortable for living that the food as above usually has high energy, high fat, high sodium, high sugar and high saturated fatty acids and it also includes physical activity and consumption of too few fruits and vegetables that all have direct negative health effects. Consequently, changing the dietary intake to be correct according to the nutritional is an important preventive strategy. Therefore, it is necessary to encourage consumers to have sufficient knowledge in choosing foods that are suitable for their physical and health conditions. And must promote food that is suitable for consumers to access and buy. Then nutrition information on food products has become a tool to educate consumers that are very important because it can encourage consumer to use label to make healthy food choice (Food and Drug Administration, 2013). Thailand's product label currently allowed are nutrition fact panel, Guideline Daily Amount (GDA) label, healthier choice symbol and nutrition and health claim (Royal Thai Government Gazette, 1998). But because of nutrition fact panel too difficult to understand for consumer (Roberto, C. A. and Khandpur, N., 2014) then this study we focus on GDA label, choice symbol and nutrition and health claim that were developed to be easy to understand and more consumers friendly. The most of previous studies who focused on consumer use of nutrition and health labels and the impact there of on consumer choice have focused on a specific region or location, i.e. Northern Europe and the Unites States and in order to assess the impact of product information on behavior change and come to a conclusion that would apply for the EU as a whole, (Cowburn and Stockley, 2005; Williams, 2005; Drichoutis et al., 2006 and Grunert and Wills, 2007). So, we need to gain a deeper understanding of regional differences because the previous studies who focused on a specific region, it cannot explain nutrition label on food product that affect to healthy food choice of Thai consumer. Moreover, no one ordered the labels that have the most effect to healthy food choice. Therefore, in this research we will investigate use of the labels that affect to consumer's healthy food choice. Then, in this manner we can gain an understanding what type of healthier food choices can be better promoted.

2. Literature Review

In the current, people in modern lifestyle the nutritional habits are not corrected nutritional especially the consumption of high energy foods and high fat, high sodium, high sugar, saturated fatty acids including physical activities and consumption of vegetables and fruits too little. The result is more energy than required cause obesity problems (Thaiposts, 2017) that Thailand has the prevalence of obesity was ranked second among the countries of Southeast Asia at 8.5 percent (Asia Roundtable on Food Innovation for Improved Nutrition, 2017). Consequently, it is necessary to encourage consumers to have sufficient knowledge in choosing the right food for their body and health. Then nutrition information on food labels could be a cost-effective method of communicating nutrition information to consumers because the information appears at the point of sale for most packaged foods (Campos, Doxey, and Hammond, 2011). Thailand's current allowed nutrition labels are nutrition fact label (Royal Thai Government Gazette, 1998) but because of it's difficult to understand for consumer (Roberto, C. A. and Khandpur, N., 2014). Then Front of Pack (FOP)

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nutrition labeling has been developed to be easy to understand and more consumers friendly. There is evidence that easily accessible, comprehensible and consistent nutrient information on the front of packaged foods could assist shoppers to make healthier food choices (Wendy L. W. et al, 2014). Which Mara, T (2018) Front of Pack Labels is an effective tool to fight obesity and associated diseased. As same as Machín, L. et al (2018) found that the inclusion of more attention-grabbing and easily interpretable FOP nutrition information is one of the public policies that can be implemented to empower consumers to identify unhealthful food products and to make more informed food choices. Moreover, FOP nutrition labeling also stimulates healthy product development and reformulation by manufacturers that the impact of FOP nutrition labeling on industry reformulation may have greater potential to affect all consumers and independent of social demographic characteristics (Rebecca, K. et al, 2018). While Brownell, K.D. and Koplan, J.P. (2011) they has been argued that FOP nutrition labeling is marketing, rather than a public health strategy.

FOP nutrition labeling has variety system and each system has many type of labeling but in the current Thailand just allowed Guideline Daily Amount (GDA) label and the healthier choice symbol that are the one of type of FOB nutrition labeling which have the same goal as FOP nutrition labeling that mentioned above. And it also includes nutrition claims and health claims that besides it can gives us useful knowledge about the food that consumer buy and can help them to understand the contribution different foods make to our health and well-being and to choose a more balanced diet or help consumers select healthier foods (Wanwisa, 2009; The European Food Information Council, 2007), it also was used by food business operators when they want to highlight the particular beneficial effects of their products, in relation to health and nutrition, on the product label or in its advertising (European Commission, 2007). There are many research study about use of label influence healthier food choices of consumers. Barreiro, H. et al (2010) found that reading the nutrition (regardless of the type of nutrition information provided label). Consequently, consumers are more inclined to buy healthier foods than do not read nutrition labels by considering nutrition fact labels and nutrition / health claims. While nutrition fact labels in Thailand have been surveyed and found that 67.5% of consumers did not read the nutrition fact label. And in the number of readers, nutritional fact labels found that 32.5 percent read nutrition labels cannot understand (Chaladsue, 2011). As part of the Guideline Daily Amount (GDA) label, the label displays nutrition information by showing energy values. (Kcal), sugar (g) Fat (g) and Sodium (mg) by appearing on the front label packaging for consumers to see clearly and readily (Tipvon, P., Wimalin R., 2017). Food and Drug Administration (2013) the most consumers still do notunderstand the GDA label that different from 2015 that the consumer rate of GDA is quite high (Food and Drug Administration, 2015). This difference may be explained by the fact that, over time, the consumer's perception will increase. From the study of Boztuğ, Y., Jorn J. H., Elshiewy, O. and Berg Jensen, M. (2015) fond that GDA label introduction reduces attraction of unhealthier products in terms of market share but does not affect product choice behavior by price and habit exhibit the impact on purchase behavior and product choice more than the GDA label introduction. While study of Aschemann-Witzel et al (2013) found that GDA label can made food choices were more healthful.

For Nutrition and health claims have a huge impact on consumer choice (Wanwisa, 2009). As same as Chaladsue. (2011) found that nutrition/health claims affected by buying up to 76.8 percent. The claims that affect to consumer food choices the most divided by 4 groups. First, fat; low fat, fat free, saturated fat free, cholesterol free and low cholesterol. The second is sugar; sugar free. Then is about fiber; high fiber. And calorie; low calorie and calorie free (Wanwisa, 2009). While the studied claims of Jacob, L.O. and Joachim S. (2015) found that nutrition and health claims had little effect on consumer judgments of food healthfulness. In relation to Talati, Z. et al (2016) indicate that consumers generally find labels more useful than health claims.

In the studies of used of healthier choice symbol that influence healthier food choices of consumers. It is an easy-to-understand communication tool for consumers to choose foods that low sodium, low sugar and low fat by use the symbol be a substitute this information on the front of product. And it also has positive impact to decision of consumers. Miklavec, K. et al (2016) found that front of package symbol indicates the symbol's potential to promote healthier food choices by the symbols more relative important than the claims while Neuman, N. et al (2014) found that people will focus on symbols that showing information about number of calories and/or nutrients. And from the previous studies can tell that label use improves the overall quality of consumer diets or Nutrition label lead to healthier food choice (Kim et al, 2001a; Barreiro, H. et al, 2010).

3. Data

Data was gathered using a questionnaire that consumers were asked questions related to consumers' choice of healthier food product and nutrition label use. The questionnaire also contained questions on socio-demographic characteristics (sex, age, education level, career, income) and nutrition knowledge. Before under-taking the main survey, in order to prevent bias, we have made a pretest of 5 consumers to find out whether respondents understand the questions and discover and address any practical problems. The sample group were targeted to food buyers who have the age thirteen years and over due to thirteen years old is the age that people will start to care about nutrition and health (Tawanat LK.,2012). Then we have chosen a sample group by using purposive sampling in order to collect information from the sample group as mentioned above. For sample size, because the population is large and unknown quantity so this research uses w.g. cochran formula to calculate the sample size. The result of sample size is 369 and add more population for compensate that not complete then sample size will be 400 samples.

4. Research Methodology

The model was estimated by using multiple regressions. It can help us understand how close our calculations are to reality. The regression analysis is a simple yet powerful technique. Moreover, it used to explain relationships between variables and it can explain how changes in one variable can be used to explain changes in other variables (Farhad, 2018) as follow:

$$HFC = \alpha + b1G + b2\,C + b3\,H + e$$

Where HFC refer to healthier food choices of consumer, to estimate healthiness of consumer choice we using the using the information obtained from the questionnaire regarding trade-offs between health and other food product that unhealthy by the questions were worded as "When buying food products, do you usually choose a healthier food product instead of another one which is...?" if consumers choose unhealthy food all three questions a value of one, a value of two implies that they choose healthy food product one in three questions, a value of three that they choose healthy food product two in three questions, and the maximum value of four that they would always choose healthy food product. G is GDA label, C is nutrition and health claim, H is healthier choice symbol. GDA label, nutrition and health claim and healthier choice symbol were measured by reflect the frequency of use by the frequency can be enumerated that always, sometimes and never by a value of three two and one respectively.

5. Results and Discussion

Table 1 The use of labels for the decision to buy healthy food products of consumers

GDA Frequency	Percent	CLAIM Frequency	Percent	HC Frequency	Percent
Valid 1 33	14.1	31	13.2	80	34.2
2149	63.7	149	63.7	127	54.3
352	22.2	54	23.1	27	11.5
Total 234	100.0	234	100.0	234	100.0

Note: Valid 1, 2, 3 refer to never, sometimes and always respectively. GDA, CLAIM and HC refer to GDA label, Nutrition and health claim, and Healthier choice symbol respectively.

The total, 311 participants. We select the complete questionnaires remain 235 participants. From general information, it was found that most respondents were female are 79.5%, Age 20-29 years are 53.0%with the highest level of education at the bachelor's level at 65.0% the most have a career as a company employee are 38.5% Average monthly income at 30,001-45,000 baht 26.9% And a person with nutritional knowledge is 41%. In the part of the use of labels for the decision to buy healthy food products of consumers (Table1). There are consumers who use the GDA label Every purchase decision 22.2%, Nutrition and health claim 23.1% and Healthier choice symbol 11.5%. From the aforementioned percentage, it shows that the label that consumers use to make decisions every time sorted from highest to lowest, including Nutrition and health claim, GDA label and Healthier choice symbol.

Table 2 The regression result of nutrient information on the front-of- packaged foods labeling that affecting to healthy food choice of consumers.

	HEALTHY	
	Coefficients	p-value
Const	0.4096	0.0647 *
GDA	0.4731	0.0000 ***
CLAIM	0.2507	0.0012 ***
HC	0.5700	0.0000 ***
N	234	
R-squared	0.4096	
Adjusted R-squared	0.4019	

* Denotes statistical significance at the 10 per cent significance level.

*** Denotes statistical significance at the 1 per cent significance level.

In the table 2 shows the regression result of nutrient information on the front-of-packaged foods labeling that affect to healthy food choice of consumers. We found that Guideline Daily Amount (GDA) have the effect to healthy food choice of consumers by when GDA label was used increase 1 times then healthy food choice of consumers will increase 0.473 times, significant atthe 1 percent significance level. This result is consistent with previous study; they found that GDA label affect to consumers' healthy food choice and GDA labels increased the consumers' perception of the

healthfulness of more healthful products (Van, H. et al, 2012)., Michael, S.et al (2014). different from Yasemin, B.et al (2015). found that the GDA label introduction reduces attraction of unhealthier products but does not affect product choice behavior. In term of Nutrition and health claim (CLAIM) we found that nutrition and health claim are also effect to the decision to buy healthy food products of consumers by when nutrition and health claim was used increase 1 times then consumers' healthy food choicewill increase 0.250 times, significant at the 1 percent significance level as same as Wånwisa (2009) and Chaladsue (2011). that they found nutrition and health claim have a huge impact on consumer choice in the positive way. And about Healthier choice symbol (HC) we found that healthier choice symbol is also has the effect to healthy food choice of consumers by when healthier choice symbol was used increase 1 times thenthe decision to buy healthy food products of consumers will increase 0.580 times, significant at the 1 percent significance level. This result is in the same line with Krista, M., Igor, P., Monique, M. & Jure, P. (2016) that they found the symbol has positive impact to decision of consumers; the symbol's potential to promote healthier food choices. And we can tell that nutrient information on the front-of-packaged foods labeling are affecting to healthy food choice of consumers consistent from the previous studies found that label use improves the overall quality of consumer diets or Nutrition label lead to healthier food choice (Kim et al, 2001; Cliona, N. M., Helen, E.Y. J. & Tony, B, 2018; Barreiro, H. et al, 2010; Andreas, C. D. & Rodolfo, M. N. Jr., 2006).

6. Conclusion

To study investigate use of the labels that affect to consumer's healthy food choice our results provide additional empirical evidence in Thailand for the fact that use of nutrition labels can lead to healthier diet choice, the nutrition and health claim was used to make decitions the most and then GDA label and healthier choice symbol respectively. Based on these findings it can tell that the labels as one of the tools to influence consumer choice towards healthier diets and can lead consumer to choosing the right food because the nutrition label is encouraging consumers to have sufficient knowledge in healthy food choice. The implication of this study are for the business can use labels that influence the selection of healthy food to be used on their products because the label is one line of advertising to show about the particular beneficial effects of their products, in relation to health and nutrition. In addition, this study can imply for the government and consumer protection agencies use the information in this study to develop labels that will recur in the future. This measure is a survey from general consumers only. Additional, measures should be targeted to consumers who like or interested in healthy food group. Moreover, it cannot to determine what the factors that explain consumers' use of nutrition labels. Consequently, to explain the difference in the use of each label the future research should be considered.

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