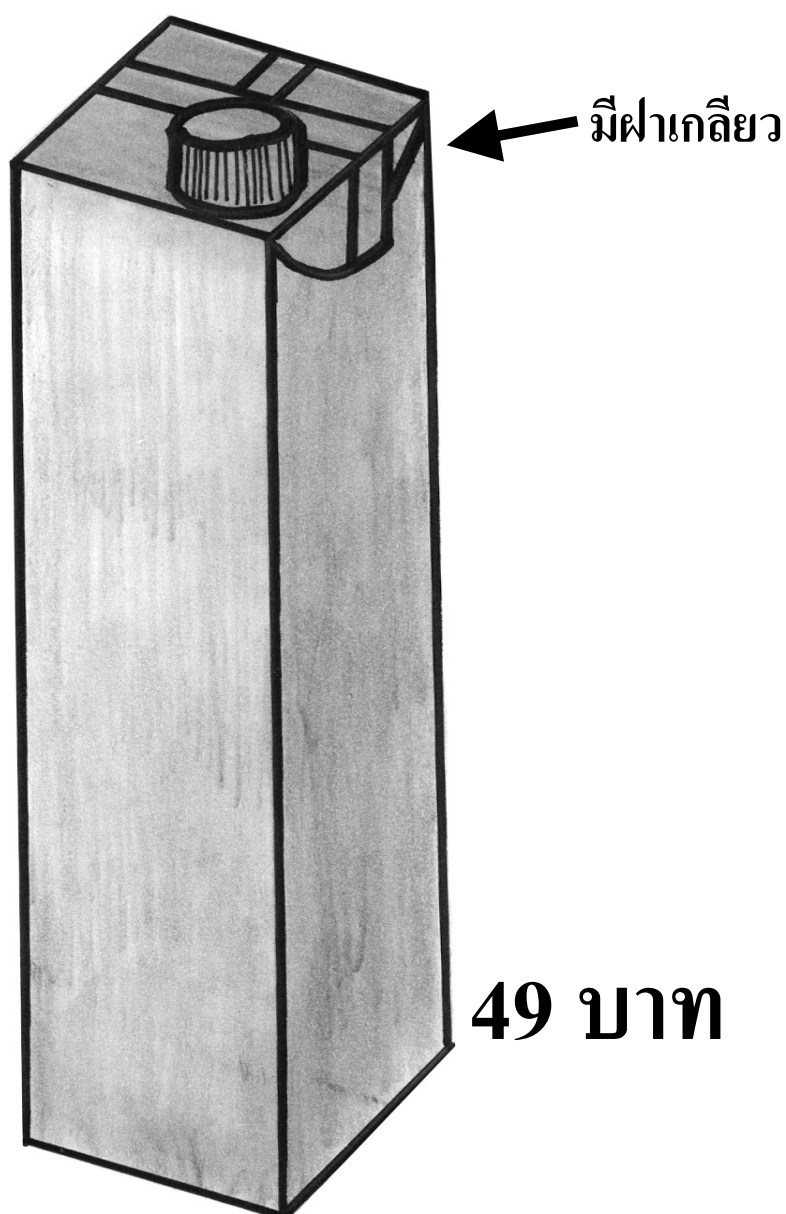


ภาชนะบรรจุแบบที่ 8

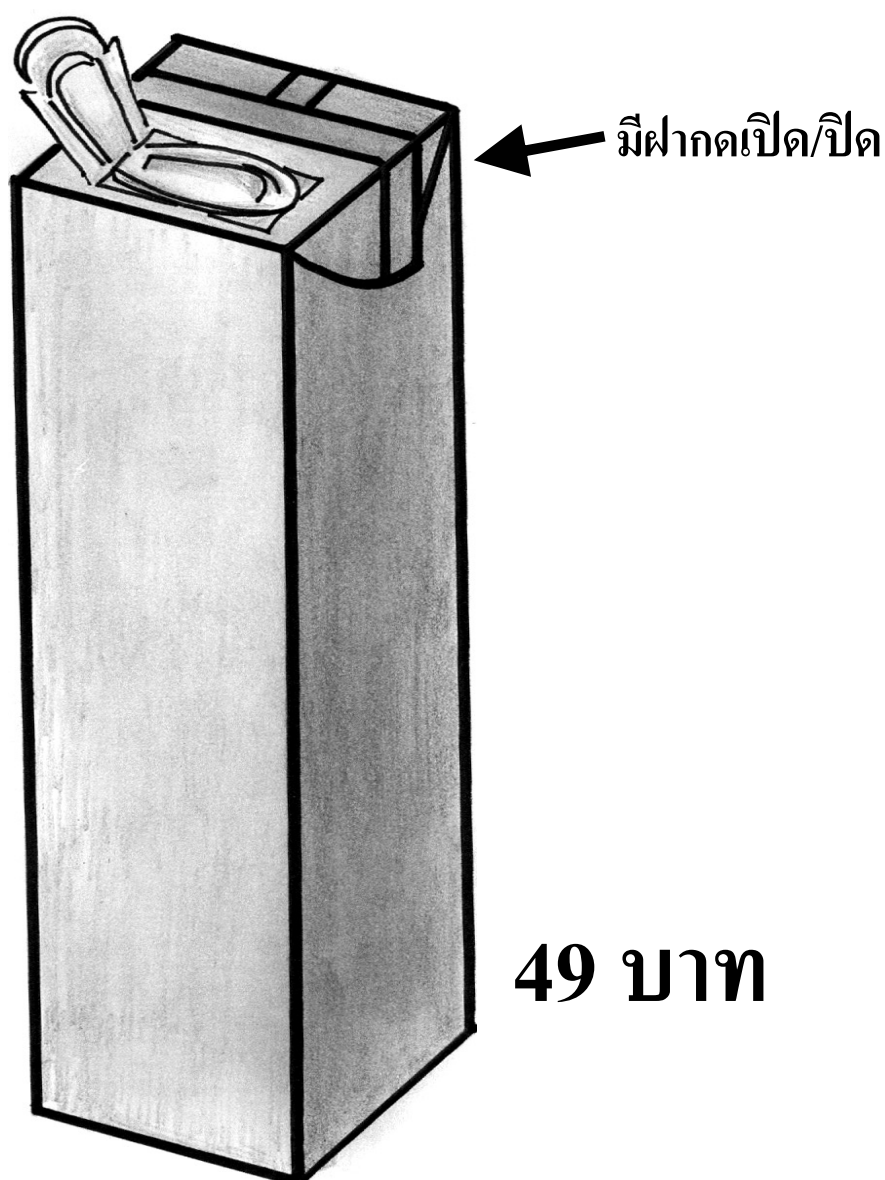
รูปทรง	การเปิดใช้	ราคา
กล่องสี่เหลี่ยมจัตุรัสทรงสูง	มีฝาเกลียว	49 บาท



ขนาดบรรจุ 1000 มิลลิลิตร

ภาชนะบรรจุแบบที่ 9

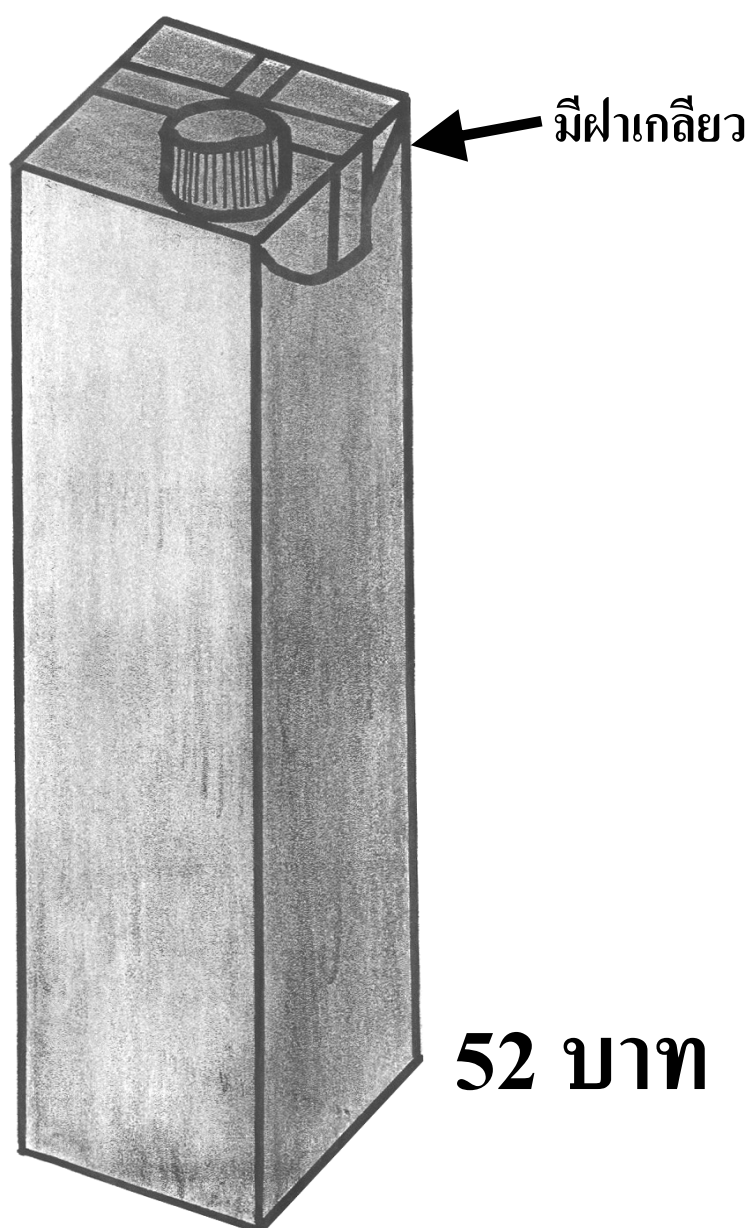
รูปทรง	การเปิดใช้	ราคา
กล่องสี่เหลี่ยมจัตุรัสทรงสูง	มีฝาแบบกดเปิด/ปิด	49 บาท



ขนาดบรรจุ 1000 มิลลิลิตร

ภาชนะบรรจุแบบที่ 10

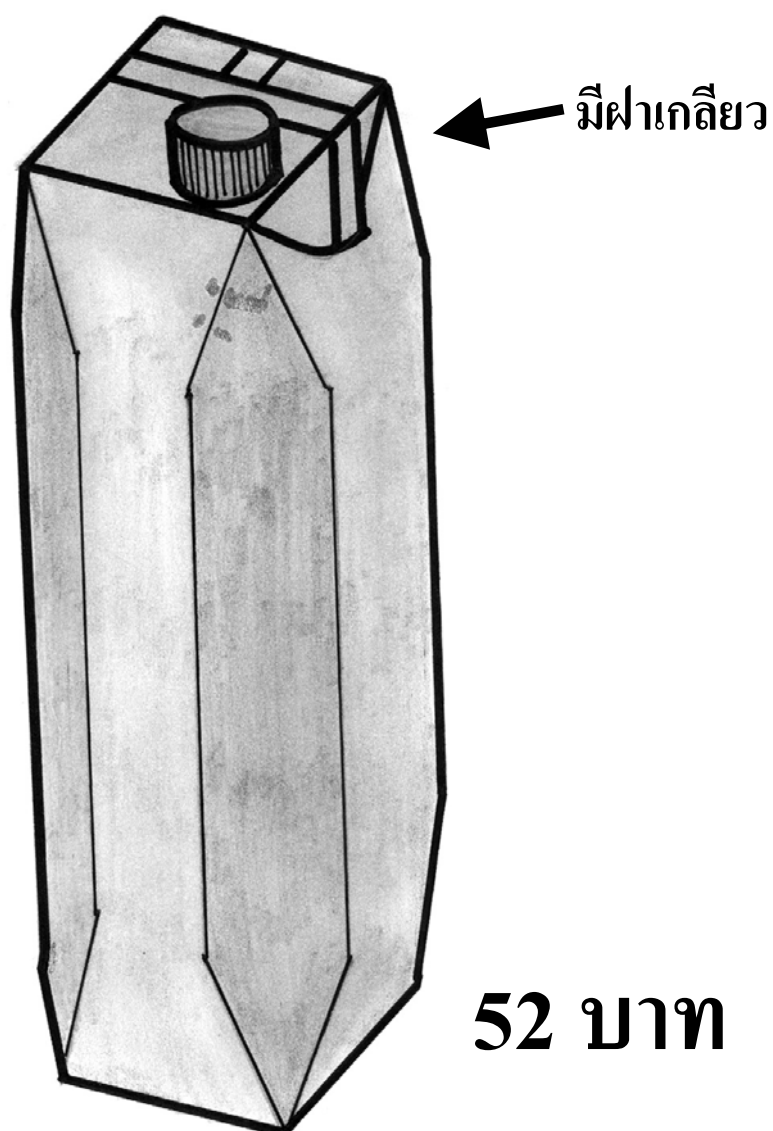
รูปทรง	การเปิดใช้	ราคา
กล่องสี่เหลี่ยมจัตุรัสทรงสูง	มีฝาเกลียว	52 บาท



ขนาดบรรจุ 1000 มิลลิลิตร

ภาชนะบรรจุแบบที่ 11

รูปทรง	การเปิดใช้	ราคา
กล่องรูปทรงพิเศษ	มีฝาเกลียว	52 บาท



ขนาดบรรจุ 1000 มิลลิลิตร

โครงการวิจัย

การวิเคราะห์ภาวะถ่วงดุลของภาชนะบรรจุที่ช่วยอำนวยความสะดวกสำหรับผลิตภัณฑ์อาหาร

Trade-off Analysis of Packaging Convenient Functionality for Food Products

สำหรับ ขวดพลาสติกบรรจุเครื่องดื่ม

ได้รับงบประมาณอุดหนุนจากสำนักงานกองทุนสนับสนุนงานวิจัย

โดย ผศ.ดร. ธัญญรัตน์ จิณกาญจน์

ภาควิชาเทคโนโลยีการบรรจุ

คณะอุตสาหกรรมเกษตร มหาวิทยาลัยเกษตรศาสตร์

50 ถนนพหลโยธิน เขตจตุจักร กรุงเทพฯ 10900

คำถามต่อไปนี้เป็นส่วนหนึ่งของงานวิจัยเรื่อง การวิเคราะห์ภาวะถ่วงดุลของภาชนะบรรจุที่ช่วยอำนวยความสะดวกสำหรับผลิตภัณฑ์อาหาร (Trade-off Analysis of Packaging Convenient Functionality for Food Products) วัตถุประสงค์ของงานวิจัยเพื่อศึกษาอิทธิพลของหน้าที่ในการอำนวยความสะดวกของภาชนะบรรจุต่อการตัดสินใจซื้อของผู้บริโภคเพื่อหาแนวทางในการออกแบบภาชนะบรรจุให้มีลักษณะหน้าที่ตรงตามที่ต้องการ

โปรดสละเวลาสั้นๆ ในการตอบแบบสอบถาม

คำตอบของท่านจะมีผลต่อความถูกต้องของข้อมูลโดยรวม

และมีอิทธิพลอย่างสูงต่อความสำเร็จของงานวิจัยนี้

ขอขอบคุณทุกท่านในการให้ข้อมูลที่เป็นประโยชน์

สำหรับผู้เก็บข้อมูล

วันที่เก็บข้อมูล	
สถานที่	
ผู้เก็บข้อมูล	
หมายเหตุ	

กรุณารอกข้อมูลหรือทำเครื่องหมาย ✓ หน้าข้อที่ท่านเลือก

IX. ข้อมูลทั่วไป

1.1 เพศ : ☐ ชาย ☐ หญิง

1.2 อายุ : ☐ น้อยกว่า 20 ปี ☐ 21-30 ปี ☐ 31-40 ปี ☐ 41-50 ปี

☐ 51-60 ปี ☐ มากกว่า 60 ปี

1.3 ระดับการศึกษาสูงสุด: ☐ ต่ำกว่าปริญญาตรี ☐ ปริญญาตรี ☐ สูงกว่าปริญญาตรี

1.4 อาชีพ: ☐ แม่บ้าน/พ่อบ้าน ☐ รับราชการ/รัฐวิสาหกิจ ☐ บริษัทเอกชน

☐ นิสิตนักศึกษา ☐ ธุรกิจส่วนตัว ☐ อื่นๆ โปรดระบุ _____

1.5: สถานะภาพสมรส:

☐ โสด ☐ สมรส ไม่มีบุตร ☐ สมรส มีบุตรอายุ ≤ 15 ปี

☐ สมรส มีบุตรอายุ > 15 ปี ☐ หม้าย/หย่า

1.6: รายได้ครอบครัวเฉลี่ยต่อเดือน (บาท):

☐ < 10,000 ☐ 10,000-20,000 ☐ 20,001-30,000

☐ 30,001-50,000 ☐ > 50,000

1.5 ความถี่ในการเลือกซื้อเครื่องดื่มบรรจุขวดพลาสติกของท่านโดยเฉลี่ยในรอบ 1 เดือน:

☐ < 1 ครั้ง ☐ 1-2 ครั้ง ☐ 3-5 ครั้ง

☐ 5- 10 ครั้ง ☐ >10 ครั้ง

X. โปรดระบุปัญหาในการใช้งาน 3 อันดับแรก ของ ขวดพลาสติกบรรจุเครื่องดื่มทั่วๆ ไป เช่น ขวดน้ำดื่ม ขวดน้ำผลไม้ หรือขวดชา กาแฟพร้อมดื่ม ที่ท่านซื้อในท้องตลาด โดยใส่หมายเลข 1-3

หน้าข้อ ทั้งนี้ 1 = ปัญหาสำคัญมากที่สุด)

☐ ไม่เคยพบปัญหาใด ๆ

☐ ต้องออกแรงมากในการเปิดขวด

☐ ต้องใช้อุปกรณ์ช่วยในการเปิด

☐ ผลิตภัณฑ์หกในขณะเปิด

☐ จับขวดไม่ถนัดมือ

☐ ไม่สะดวกในการเก็บรักษา

☐ ขวด/ฝาขวดเสียหายหรือเสียรูป

☐ ข้อมูลสื่อสารบนขวดไม่ชัดเจน เช่น ขนาดอักษรเล็ก อ่านไม่ชัดเจน หรือคำอธิบายไม่ชัดเจน

☐ ปัญหาอื่น ๆ ได้แก่ _____

☐ ไม่ทราบว่าจะเปิดอย่างไร

☐ ไม่สะดวกในการพกพา

☐ ข้อมูลสื่อสารเกี่ยวกับวิธีการเปิดไม่ชัดเจน

☐ ไม่สามารถปิดขวดเก็บเมื่อรับประทานไม่หมด

☐ ไม่สะดวกในการเทหรือดื่มผลิตภัณฑ์จากขวด

☐ ข้อมูลสื่อสารที่แสดงไม่ครบถ้วน

☐ ผลิตภัณฑ์เสื่อมเสีย/เสียหายเนื่องจากขวดไม่สมบูรณ์

XI. อิทธิพลของภาวะถ่วงดุลระหว่างราคาและลักษณะหน้าที่ในการอำนวยความสะดวกของขวดพลาสติกบรรจุเครื่องดื่ม ต่อการตัดสินใจซื้อผลิตภัณฑ์

กรณีศึกษาในขวดบรรจุน้ำดื่มขนาด 500 ml

คำชี้แจง: กรุณาเรียงลำดับ ตัวอย่างขวดพลาสติกบรรจุน้ำดื่มขนาด 500 ml ที่แนบมา โดยเรียงลำดับจาก ภาชนะบรรจุแบบที่ ท่านจะเลือกซื้อเป็นอันดับแรกจนถึงอันดับสุดท้าย ทั้งนี้ผลิตภัณฑ์ที่บรรจุในขวดแต่ละรูปแบบมีลักษณะเหมือนกัน สิ่งที่แตกต่างคือลักษณะของภาชนะบรรจุและราคาขาย ดังที่กำหนดในแต่ละแบบ

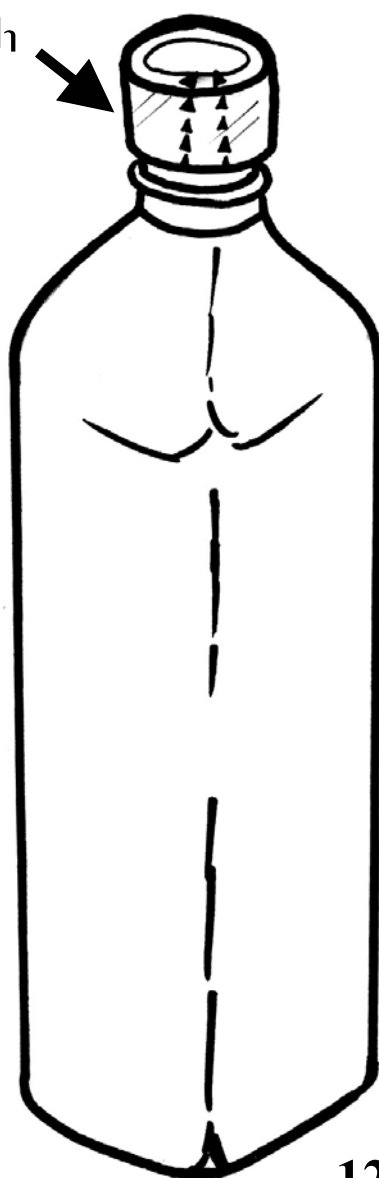
ลำดับในการเลือกซื้อ	ภาชนะบรรจุแบบที่	หากท่านต้องการให้ข้อมูลเพิ่มเติมเกี่ยวกับการเรียงลำดับ โปรดระบุ
ท่านจะเลือกซื้อเป็นอันดับแรก	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
ท่านจะเลือกซื้อเป็นอันดับสุดท้าย	9	
	10	

XII. ความเห็นเพิ่มเติมของท่านต่อลักษณะหน้าที่ในการอำนวยความสะดวกในการใช้งานของ ขวดพลาสติกบรรจุเครื่องดื่ม ที่ท่านต้องการ หรือต้องงานวิจัย

ภาชนะบรรจุแบบที่ 1

รูปทรง	ลักษณะโครงสร้าง	การเปิด	การป้องกันการเปิดก่อน	ราคาขาย
ทรงเหลี่ยม	ไม่มีลอนที่ตัวขวด	มีฝาเกลียว	มีพลาสติกหดรัดที่ฝา	12 บาท

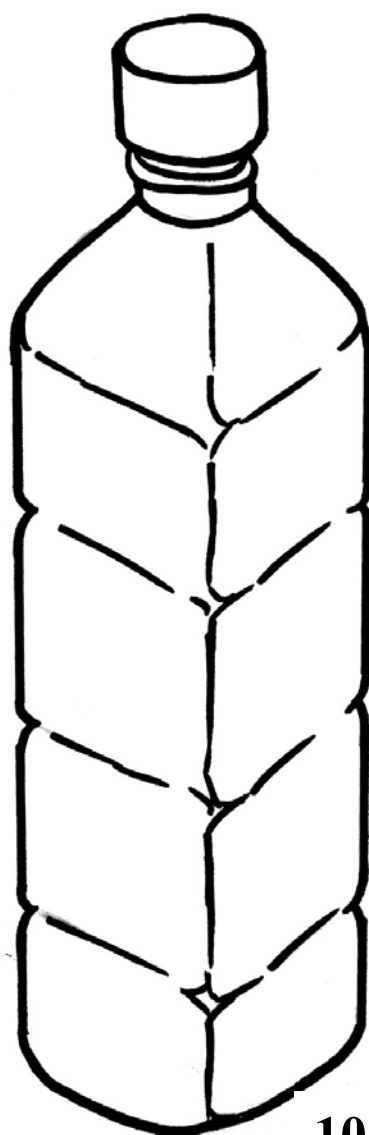
มีพลาสติกหดรัดที่ฝา



12 บาท

ภาชนะบรรจุแบบที่ 2

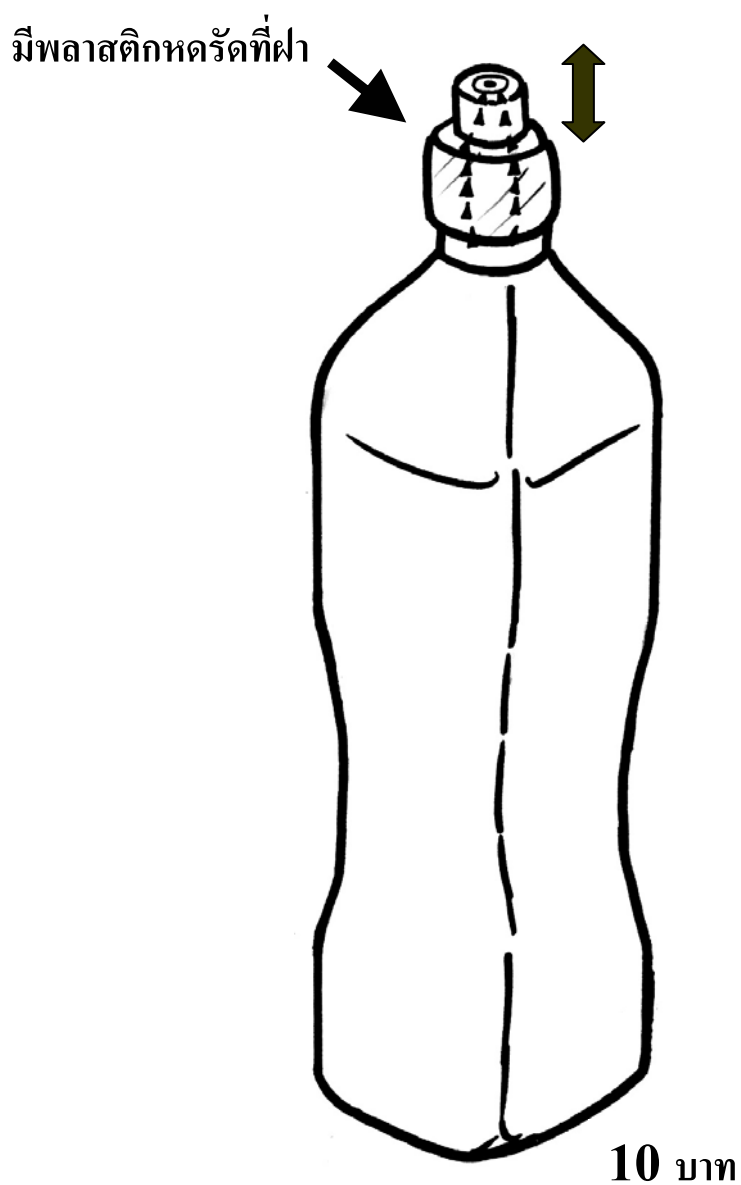
รูปทรง	ลักษณะโครงสร้าง	การเปิด	การป้องกันการเปิดก่อน	ราคาขาย
ทรงเหลี่ยม	มีลอนที่ตัวขวด	มีฝาเกลียว	ไม่มีพลาสติกหดรัดที่ฝา	10 บาท



10 บาท

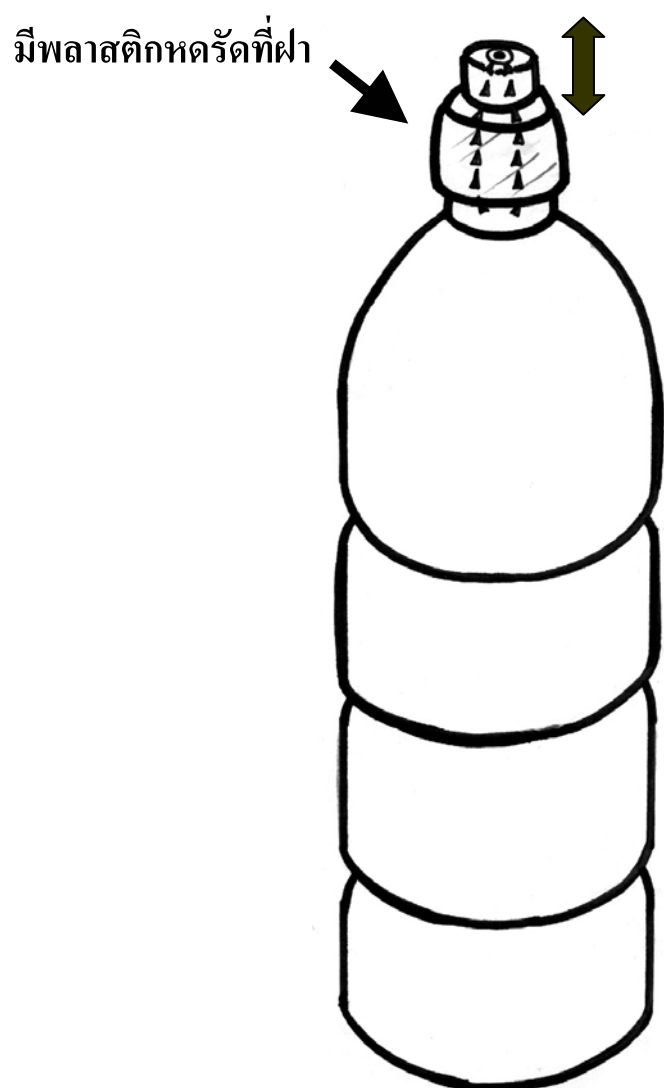
ภาชนะบรรจุแบบที่ 3

รูปทรง	ลักษณะโครงสร้าง	การเปิด	การป้องกันการเปิดก่อน	ราคาขาย
ทรงเหลี่ยม	มีลักษณะเว้าที่ตัวขวด	มีฝาตึงกด	มีพลาสติกหดรั้วที่ฝา	10 บาท



ภาชนะบรรจุแบบที่ 4

รูปทรง	ลักษณะโครงสร้าง	การเปิด	การป้องกันการเปิดก่อน	ราคาขาย
ทรงกลม	มีลอนที่ตัวขวด	มีฝาตึงกด	มีพลาสติกหดรัดที่ฝา	12 บาท



12 บาท

ภาชนะบรรจุแบบที่ 5

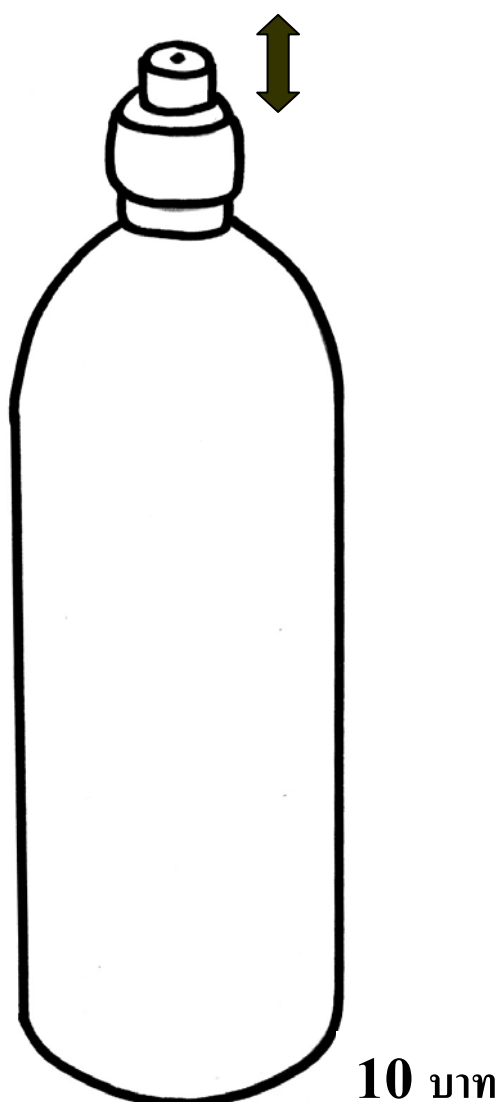
รูปทรง	ลักษณะโครงสร้าง	การเปิด	การป้องกันการเปิดก่อน	ราคาขาย
ทรงเหลี่ยม	มีลักษณะว่า ที่ตัวขวด	มีฝาตึงกด	ไม่มีพลาสติกหดรัดที่ฝา	12 บาท



12 บาท

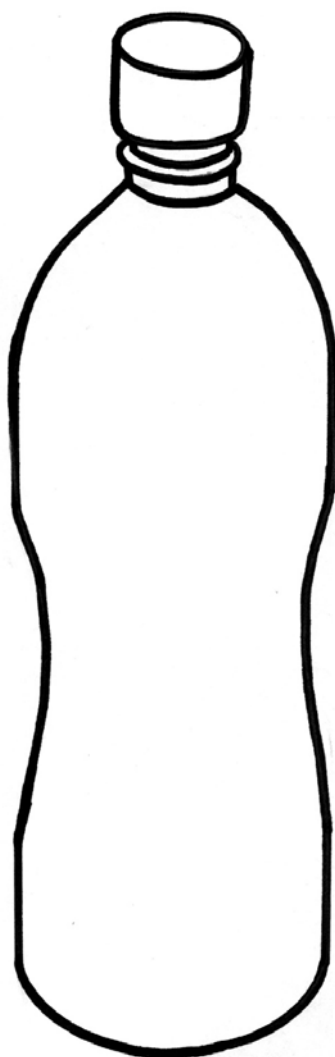
ภาชนะบรรจุแบบที่ 6

รูปทรง	ลักษณะโครงสร้าง	การเปิด	การป้องกันการเปิดก่อน	ราคาขาย
ทรงกลม	ไม่มีลอนที่ตัวขวด	มีฝาตึงกด	ไม่มีพลาสติกหดรัดที่ฝา	10 บาท



ภาชนะบรรจุแบบที่ 7

รูปทรง	ลักษณะโครงสร้าง	การเปิด	การป้องกันการเปิดก่อน	ราคาขาย
ทรงกลม	มีส่วนเว้าที่ตัวขวด	มีฝาเกลียว	ไม่มีพลาสติกหดรัดที่ฝา	12 บาท

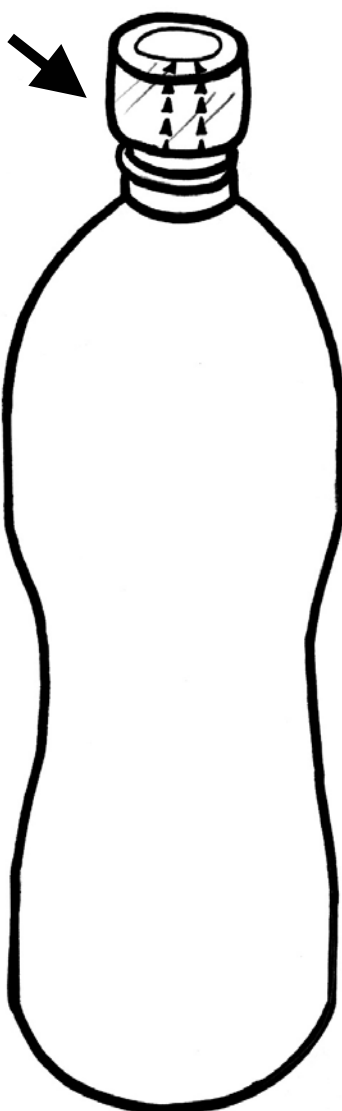


12 บาท

ภาชนะบรรจุแบบที่ 8

รูปทรง	ลักษณะโครงสร้าง	การเปิด	การป้องกันการเปิดก่อน	ราคาขาย
ทรงกลม	มีส่วนเว้าที่ตัวขวด	มีฝาเกลียว	มีพลาสติกหดรัดที่ฝา	10 บาท

มีพลาสติกหดรัดที่ฝา

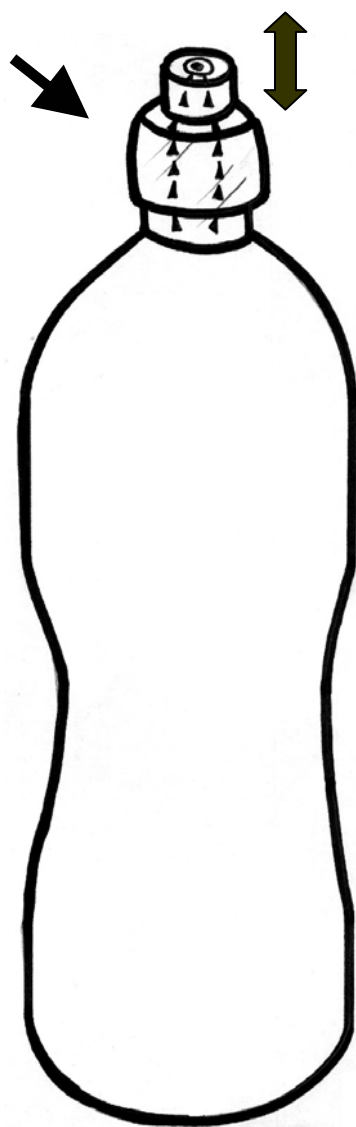


10 บาท

ภาชนะบรรจุแบบที่ 9

รูปทรง	ลักษณะโครงสร้าง	การเปิด	การป้องกันการเปิดก่อน	ราคาขาย
ทรงกลม	มีส่วนเว้าที่ตัวขวด	มีฝาตึงกด	มีพลาสติกหดรัดที่ฝา	10 บาท

มีพลาสติกหดรัดที่ฝา

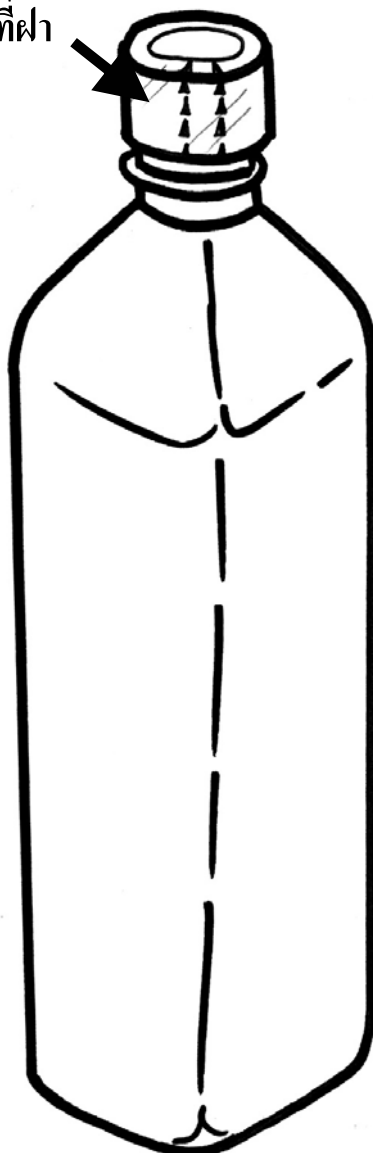


10 บาท

ภาชนะบรรจุแบบที่ 10

รูปทรง	ลักษณะโครงสร้าง	การเปิด	การป้องกันการเปิดก่อน	ราคาขาย
ทรงเหลี่ยม	ไม่มีลอนที่ตัวขวด	มีฝาเกลียว	มีพลาสติกหดรัดที่ฝา	10 บาท

มีพลาสติกหดรัดที่ฝา



10 บาท

ภาคผนวก ค

ผลงานนำเสนอและตีพิมพ์

Consumers' perspectives and trade-off on packaging functions

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ABSTRACT

Goods packages must perform well according to the intended designed perspectives. Packaging has several important functions in the supply chain from the filler to the consumer in the retail trade. Main packaging functions include containment, protection or preservation, communication, and convenient functions. Understanding of packaging functions for particular products can help packaging engineers or packaging designers developing high performance packages that suit the consumer needs. Nowadays, lifestyles have changed and consumers sometime willing to pay more for improvements like a spout on food packages, therefore, packagers and their packaging suppliers should pay closer attention to added convenient functions that create value to their products with acceptable cost. This paper aims to understand the consumer perspectives regarding importance of particular packaging functions and trade-off on convenient features of a selected food package versus increased cost. The research composed of two parts. First part is to understand consumer perspectives on importance of specific packaging functions and the second part is a case study that addresses the customer trade-off between increased cost and added convenient functionality of plastic bottles for beverages through conjoint analysis method. This research utilizes the structured personal interviews and questioners to collect pertinent data. Data collections are conducted at major supermarkets within Bangkok and vicinity for both first and second parts. During data collection, 500 interviews are conducted for the first part and 120 interviews are conducted for the conjoint analysis of the second part. The result show that consumers give higher importance score to convenient and communication functions of the packaging. According to the conjoint analysis, most consumers are willing to trade-off on increased price to compensate for added convenient functions. The findings of this study can be used in making strategic decision regarding packaging convenient functions during packaging development process.

Keywords: *packaging functions, consumer perspectives, convenient, conjoint analysis, beverages packaging*

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1. INTRODUCTION

Packaging can be considered as an integral part of the product and is the first point of contact with the brand for a consumer product.¹ Packaging has several important functions in the supply chain from the filler to the consumer in the retail trade. Main packaging functions include containment, protection, preservation, communication, and convenient.²

The containment function is considered basic packaging characteristic that can make it possible to transport various goods in appropriate packed sizes and to prevent product leakage. Protection and preservation functions are also critical which will ensure undamaged products in acceptable quality to final customers. Further, for communication function, the package must have or provide important information about the product in a clear format. Handling instructions of the products and packages should also be part of the needed information. Communication function also involves delivery brand images and product positions through packaging structural and graphic designs. Fully convenient function offers the consumer with ease of use, handling, storage, and preparation. For a manufacturer's point of view, convenient also refers to ease of pack and distribution. Other packaging functions classifications can also be seen including environmental function, logistic function, and marketing function.^{1,3,4}

Understanding of packaging functions for particular products can help packaging engineers or packaging designers developing high performance packages that suit the consumer needs. Nowadays, lifestyles have changed and consumers sometime willing to pay more for improvements like a spout on food packages, packagers and their suppliers should pay closer attention to added convenient functions that create value to their products with acceptable cost.

Although, various studies have indicated that convenient packages are getting more popularity^{5,6}, there are a number of convenient features that can be integrated onto the packages. For example, type of opening spouts in juice carton can be constructed in various forms which all structures can offer same or similar pouring capability. Due to the variety of new innovative packaging structures and functions, the consumers, sometimes, do not exactly understand true benefits or objectives of those functionalities. As a result, there are some misuses, especially in specific groups of customers such as for the older or for group of low income. As a consequence, some customers still prefer the old fashioned packages due to the ideas that added convenient packages are more expensive.⁷

Although packaging has important impacts on customers' purchasing decision, the study related to packaging functions in managerial perspectives is quite limited. Early research focused more on influence of packaging design on customer acceptance of the product.^{8,9} Later, more research pay more attention on communication function of the packages. Some research also studied on optimum packing size for particular package and product.¹⁰ Recently, a number of research have been focused in ways to leverage packaging as a marketing tools.^{11,12,13} In addition, there were no publications that attempt to perform detail analysis of packaging functions for particular product such as opening functionality for a certain boxes or added features for pouches that the customers prefer. Most research that deals with convenient characteristics of particular products is usually conducted in-house at manufactures or company levels which are not found in publications.

In Thailand, packaging structural design has been updated to follow the new lifestyles of working individuals in the urban whose spend most of their time in the cars and at their offices. People in Thailand especially in Bangkok, have less time for grocery shopping, cooking, or even having no time for proper breakfast. Packaging attributes that offer convenient functionality for open, storage, and preparation are becoming more attractive.¹¹

This paper aims to illustrate the consumers' perspectives on basic packaging functions as well as to provide a case study on customers' trade-off between convenient features and the increased price. The findings of this study can be used in making strategic packaging decision to better gain customer satisfaction.

2. MATERIALS AND METHODS

Questionnaire development

Administered survey was conducted to gain boarder views on consumers' perspectives regarding importance of particular packaging functions in general. Additional selective interviews from the respondents of the survey were also performed with major shoppers for beverages such as green teas, juices, and drinking waters in order to gain their perspectives on degree of importance for beverages' packaging functions.

Questionnaire survey was developed according to data derived from related literatures. The questions were classified into three sections. The first section was to ask the respondents about their personal information. The second section was to investigate packaging related factors that influence the customers' purchasing decisions in general and, filly, the last section, was to ask the respondents to rate the importance of particular packaging functions on a five-point scale which five means extremely important and one mean not important. For the last section of the questionnaire, data collections were planed to ask selective respondents same questions with regard to packaging for general products as well as with regard to packaging for beverages. During the questionnaire development, all questions were examined for clarity of wordings and the pilot tests were conducted.

Data collections were randomly conducted at two major supermarkets within Bangkok and vicinity, Tesco and Carrefour. Additional data collection locations were at major department stores as well as government district offices within Bangkok. Data collections were performed during November, 2007, through January, 2008.

2.2. Conjoint analysis approach: a case study on plastic bottle for beverages

Conjoint analysis is a technique which models the true of consumer trade-offs among multi-attribute products or services. The model assumes that alternative product concepts can be defined as a series of specific levels of a common set of attributes. It also assumes that the total utility the consumer derives from a product is determined by the utilities (part-worths) contributed by each attribute level.¹⁴

Conjoint analysis allows defining customer needs more accurately than it is possible with using simple questioners. Rather than ask about the importance of attributes individually, the research setting is made quite close to actual decision making in a real market: where the customer's task is to rank the different product alternatives which are offered to him and pick out the one that creates most value for him.¹⁵

Conjoint analysis uses customer's preference-estimations towards a set of experimental product concepts as an input. Hypothetical product concepts are presented as the descriptions of the products in the form of a bundle of particular product attributes. Concepts are shown on "concept cards".¹⁶ Based on data gathered with conjoint analysis, it is possible to find the utility of the examined product attributes to a particular customer and thereby calculate the relative importance of different product attributes.¹⁷

The case study on plastic bottle for beverages in this study was aimed to determine the relative importance of packaging convenient function attributes. Plastic bottle for dinking water was selected for the case study. Since, according to the first part of the research, convenient functions were quite importance in the consumers' perspectives, detail analysis on consumers' trade-off for certain convenient features on packages might help understanding the exact needs of the consumers for particular product-package systems. Determining of factors and levels to be included in the design of the packaging profiles for consumer ranking was derived from consulting with selected interviewees from the first part of the research. Interested factors include bottle structures (square or round), body styles (shapes) of the bottle (with rib, without rib and concaved), opening features (screw cap or push pull cap), and prices (10 baht and 12 baht). Addition factors that related to safety features of using or consuming the product which is having or not having shrink film at the opening cap of the bottle was also added into the card profiles.

Price was included in the study to elicit the consumers' trade-off for increased price on other convenient attributes. The price differences was only two baht which was just to compensate for increased cost that might affect manufacturers with some additional features on the bottles. As a result, the customer's trade-off for the case study is considered only at a regular sales occasion basis in order to reduce sales promotion effect from the data analysis.

The conjoint analysis model of the case study for each individual was specified as:

$$W_i = \beta_{i1} + \beta_{i2}\text{STRUCTURE} + \beta_{i3}\text{SHAPE} + \beta_{i4}\text{OPENING} + \beta_{i4}\text{TAMPER} + \beta_{i4}\text{PRICE} + E_i, \quad (1)$$

where W_i is the utility or preference level of the i^{th} individual for the plastic bottle with regards to convenient attributes and prices; STRUCTURE is the type of bottle structures; SHAPE represents the body styles; OPENING is the opening features; TAMPER is the present or not present of shrink film at the cap of the bottle; PRICE represents the product's prices; and E_i is a random error term.

Assuming there are no interaction effects, the use of the fraction orthogonal design procedure Orthoplan in SPSS (SPSS program version 15.0) generated eight packaging profiles with two holdout cases for validity. Hair et al¹⁸ recommended that interaction terms may be avoided. This is because any gains due to a more accurate representation of consumer preferences are often offset by the reduction in statistical efficiency.

Packaging profile cards listed for the case study is displayed in Table 1. In addition, examples of the packaging card profile presented to the consumers are illustrated in Figure 1. The interviewees were asked to rank all ten packaging profiles according to their preference. Pretests were also conducted to ensure the understanding of the stimuli cards. In the study, two validation stimuli were included. These validation stimuli were ranked at the same time as other stimuli but withheld from the analysis at the estimation stage.

Interviewees for the case study were different individuals from the first part of the research. However, data collections were randomly conducted at same locations during March and April of 2008, after the completion of the data analysis of the first part of the research.

Table 1. Card List for the Case Study

Card ID	Structure	Shapes	Opening	Tamper evident	Price
1	shaped	without rip	screw cap	with shrink film	12 Baht
2	shaped	with rip	screw cap	without shrink film	10 baht
3	shaped	concaved	push pull	with shrink film	10 baht
4	round	with rip	push pull	with shrink film	12 Baht
5	shaped	concaved	push pull	without shrink film	12 Baht
6	round	without rip	push pull	without shrink film	10 baht
7	round	concaved	screw cap	without shrink film	12 Baht
8	round	concaved	screw cap	with shrink film	10 baht
9*	round	concaved	push pull	with shrink film	10 baht
10*	shaped	without rip	screw cap	with shrink film	10 baht

* = holdout case

3. SURVEY RESULTS AND DISCUSSION

Characteristics of the survey respondents

A total of 500 respondents were participated for the administered survey. Within the group, 61 percent were female. Most of the respondents were in the age of 20-59 year old and very few respondents, approximately one percent, were more than 60 year old. Respondents' characteristics of the questionnaire are presented in Table 2-3.

Within 500 respondents, some were selected to repeat their answers for the third section twice, first for packaging in general and second based on beverage packaging such as juices green tea, or drinking water packages. These respondents were selected due to their time availability as well as their familiarity and their frequent purchasing for the products. After the completion of data collection, 206 respondents completed the additional survey for beverage packaging. Some selected respondents' characteristics are displayed in Table 4.

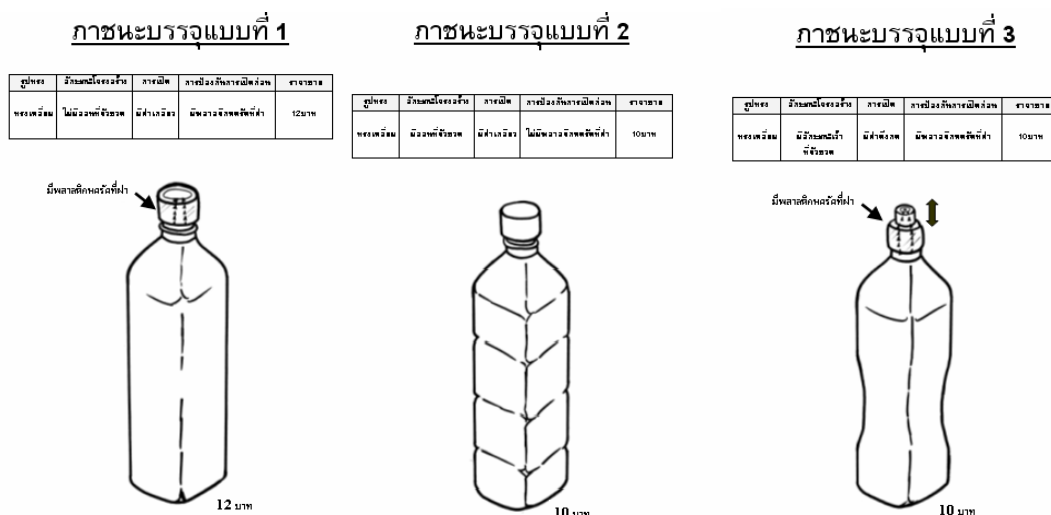


Figure 1. Examples of packaging profile cards

Table 2. Respondents' Characteristics for the Administered Survey Classified by Age Groups

Age	Sex				Total	
	Male		Female			
	Numbers of respondents	Percentage of total	Number of respondents	Percentages of total	Numbers of respondents	Percentages
<20	21	4.2	26	5.2	47	9.4
20-29	91	18.2	174	34.8	265	53.0
30-39	26	5.2	52	10.4	78	15.6
40-49	32	6.4	23	4.6	55	11.0
50-59	19	3.8	31	6.2	50	10.0
More than 60	2	0.4	1	0.2	3	0.6
Not indicated	1	0.2	1	0.2	2	0.4
Total	192	38.4	308	61.6	500	100.0

Table 3. Respondents' Characteristics for the Administered Survey Classified by Occupations

Occupations	Sex				Total	
	Male		Female			
	Numbers of respondents	Percentage of total	Number of respondents	Percentages of total	Numbers of respondents	Percentages
Students	71	14.2	123	24.6	194	38.8
Self own business	29	5.8	28	5.6	57	11.4
Company employees	67	13.4	101	20.2	168	33.6
Government officers	16	3.2	31	6.2	47	9.4
Stay home, housewife	0	0	16	3.2	16	3.2
Others	9	1.8	8	1.6	17	3.4
Not indicated	0	0	1	0.2	1	0.2
Total	192	38.4	308	61.6	500	100

Table 4. Respondents' Characteristics for the Administered Survey Classified by Age Groups for Selected Respondents on beverage packaging

Age	Sex				Total	
	Male		Female			
	Numbers of respondents	Percentage of total	Number of respondents	Percentages of total	Numbers of respondents	Percentages
<20	9	4.4	6	2.9	15	7.3
20-29	49	23.8	84	41.0	133	64.6
30-39	9	4.4	20	9.7	29	14.1
40-49	9	4.4	6	2.9	15	7.3
50-59	1	0.5	11	5.3	12	5.8
More than 60	1	0.5	0	0.0	1	0.5
Not indicated	0	0.0	1	0.5	1	0.5
Total	78	38.0	128	62.4	206	100.1

Factors influencing consumers' purchasing decisions

The results indicated that top three important packaging related factors that influencing consumers' purchasing decision for general products group are packaging strength (mean importance score=3.978), information provided on packages(mean importance score=3.889), and packaging convenient characteristics (mean importance score=3.748) respectively. For the beverage group, top three factors that influencing consumers' purchasing decision are information provided on packages (mean importance score=3.941), packaging strength(mean importance score=3.791),and packaging convenient characteristics (mean importance score=3.768) respectively.

According to the results, the top three factors influencing purchasing decisions of both groups seem to be the identical. From overall results, the average score on level of importance for each packaging related factor still in the range from 3 to 4, which means from medium importance level (3) up to quite importance level (4). The differences for each factor are quite minimal and the standard deviations are quite high. However, this results supported previous finding of other research on the increasingly importance of convenient and information function of the packaging.^{5,6,11,12,13} in current and future marketplace. Besides convenient and information function, packaging strength which is related to protection function is still quite importance in the consumers' perspectives.

Consumers' perspectives on packaging functions

Consumers' perspectives profiles on importance level of various packaging functions are shown in Figure 1-2. The packaging functions categories provided in the survey for customer evaluation were composed of six major functions including containment, protection/preservation, convenient, information, safety characteristics of the packages as well as environmental aspects. All majors functions were also composed of details attributes within the same category. For example, in the convenient group, detail attributes that were included are, for example, easy to open, easy to pure or taking out the product, reseal ability, microwaveable, and stackable. Another example is for the information function group, examples of detail attributes include readability of font size, having nutrition fact information, having instruction information, and having manufacturing or expiring date information.

According to the result, consumers seem to have a similar profile for their packaging perspectives on the importance level of various packaging functions as can be seen in Figure 3 for the importance level profiles of the packaging for general product group versus packaging for beverage group. Same profile patterns are also found for consumers in different age groups (Figure 2).

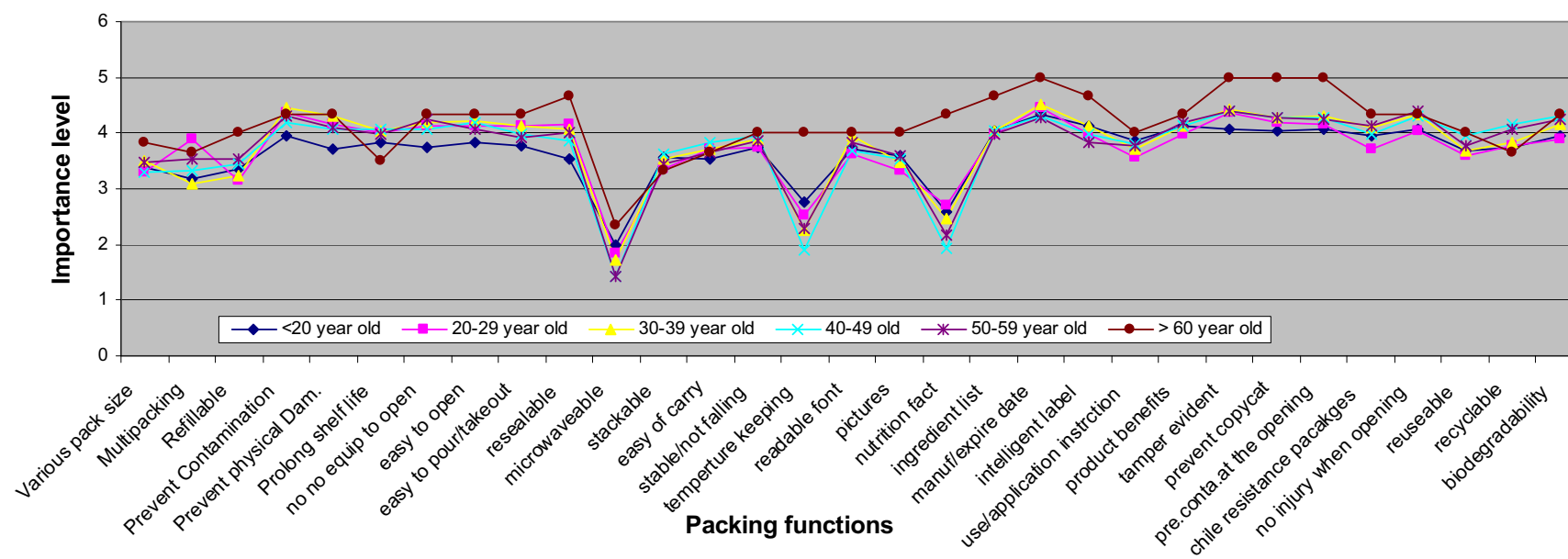
For three specific packaging attributes which are microwavable, temperature control ability, and having nutrition facts information, there have been quite low average importance score for packaging of general products group. This is due to the fact that these factors are more related to packaging for foods or beverages products. As a consequence, the importance score of these three factors in the beverage packaging group seem to be quite high compared to packaging for general products group (see Figure 3).

Table 5. Importance Level of Packaging Related Factors on Customers' Purchasing Decisions for food and beverage products

Product		Price	Brand	Packing Size	Convenient	Information provided	Picture on packages	Graphic design	Recycle ability	Packaging Strength
Beverages (206 respondents)	Mean	3.491	3.518	3.618	3.768	3.941	3.427	3.418	3.455	3.791
	Std. Deviation	.8322	.8645	.8348	.8369	1.0530	1.0875	1.0171	1.2239	1.0674
General products (500 respondents)	Mean	3.548	3.662	3.627	3.784	3.889	3.370	3.462	3.446	3.978
	Std. Deviation	.8373	.8445	.8104	.8636	.9946	1.0786	1.0191	1.1975	4.3859

* Importance score level 1=not importance, 2= slightly importance, 3 = importance, 4= quite importance, 5 =extremely importance

Bold faces letters are selected high importance scores levels



* Importance score level 1=not importance, 2= slightly importance, 3 = importance, 4= quite importance, 5 =extremely importance

Figure 2. Consumers' perspectives on importance level of packaging functions, profiles of consumers' age groups

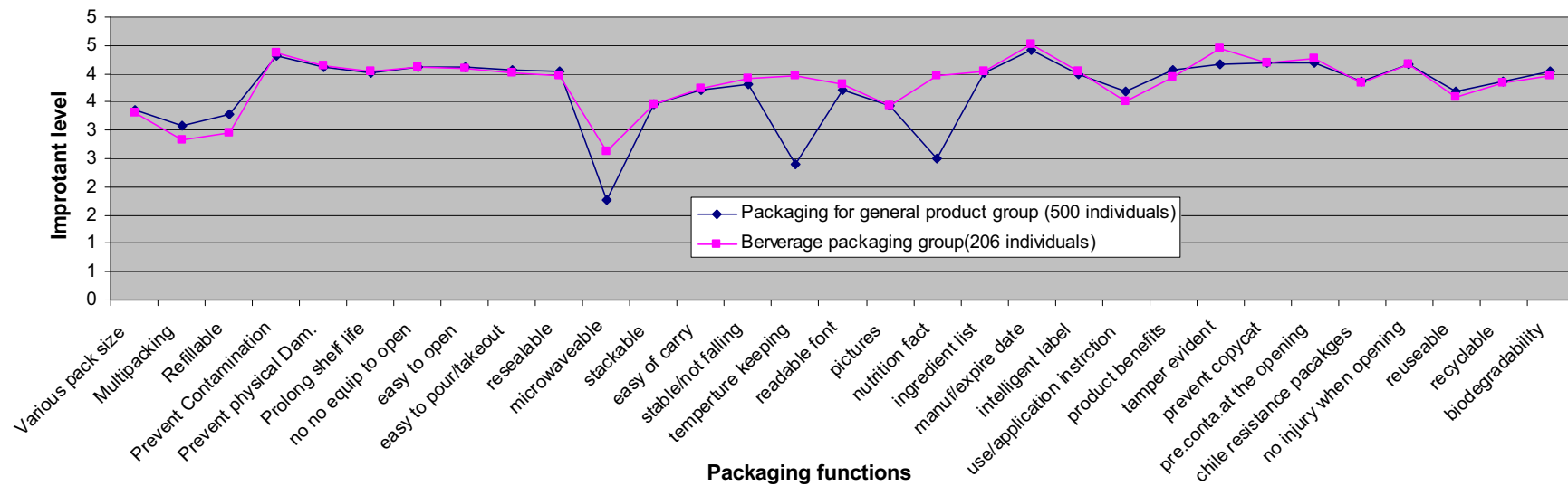


Figure 3. Consumers' perspectives on importance level of packaging functions, all respondents profiles vs beverage group profile

Table 6. Part-Worth Estimates for Convenient Attributes of Plastic Bottles for Drinking Water

Structures			Shape		Opening		Tamper evident		Price	
Round	Squared	Concaved	With rip	Without rip	Screw cap	Push-pull cap	With shrink film	Without shrink film	10 Baht	12 Baht
-0.231 (0.063)	0.231 (0.063)	-0.148 (0.085)	0.305 (0.099)	-0.157 (0.099)	0.730 (0.063)	-0.730 (0.063)	0.895 (0.063)	-0.895 (0.063)	0.135 (0.063)	-0.135 (0.063)

Note: 1. the goodness-of-fit (Kendall's tau) for the estimation samples and validation stimuli are 1.00.

2. Numbers in the parentheses are standard error

3. The constant = 4.537 (STD error =0.067)

4. CASE STUDY RESULTS

Interviewees' characteristics

The participants of the interviews were 117 individuals. Most of the interviewees were female (34.2%) and were in between 20-50 year old (Table 7). Approximately sixty three percent of the interviewees completed bachelor degree. Their occupations were evenly distributed among private companies' employees, government officers, self-own business, stay home or house keeping, and students.

Table 7. Interviewees' Characteristics Classified by Age Groups

Interviewees' age groups	Frequency	Percent
less than 20 years old	11	9.4
21-30 year old	43	36.8
31-41 year old	27	23.1
41-50 year old	16	13.7
50-60 year old	11	9.4
more than 60 year old	9	7.7
Total	117	100.0

Trade-off analysis of package convenient functions

After checking the application of the linear form for the price factor, there were approximately 30 reversals and this severely distort the relationship among levels. Therefore, separate part-worth for the price was selected for the analysis. According to the aggregate results, relative important of factors are; for structure = 11.385%; for shape = 27.026%; for opening 20.557%; for tamper evident= 30.528%; and for price = 10. 504%.

According to the results, price's relative importance seems to be less compared to other factors. This can be implied that the consumers are willing to trade-off for additional features on the package. Those features usually are packaging functions that they perceived as importance. The highest importance percentage is for tamper evident feature of the bottle which is having shrink film at the opening cap. This finding was also in accordance with consumers' perspectives survey results derived from the first part of the research.

Importance findings also include consumers have more preference on squared bottles over the rounded one. Some of the respondents revealed that round bottles were very difficult to hold and in some cases the round bottle was easy to tumble. Moreover, the bottles with ribs in the body were perceived to be more practical because the rib on the body can help prevent slippery when holding. In addition, Screw cap was more preferred. Some respondents' opinions were that the push-pull cap made it very difficult to drink form and, besides this issue, the push-pull cap was also viewed as point of contaminations. Some respondents felt unsafe to drink the water from the push-pull cap bottles.

4. CONCLUSION

Convenient and information function are perceived as quite importance for the consumers. These packaging functions also influence the consumers' purchasing decision more than prices factors for general products at a regular sales basis. Results of the case study also support the impact of convenient features on the customers' trade-off on slightly increased prices for added convenient characteristics of the packaging.

5. ACKNOWLEDGEMENT

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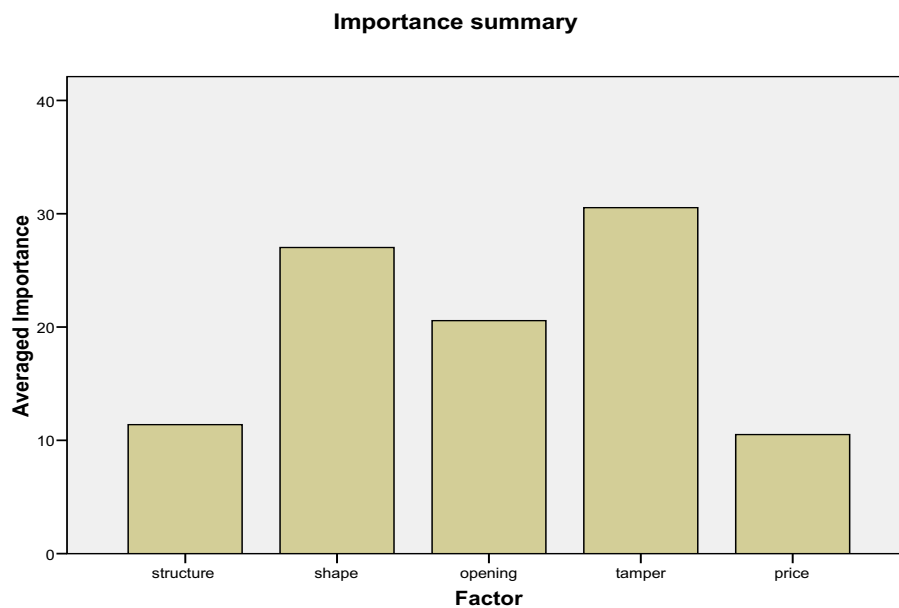


Figure 4. Relative Importance of Interested Factors

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