

**AN INVESTIGATION INTO INFORMATION
DESIGN OF NUTRITIONAL LABELS
IN MALAYSIA**

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**AN INVESTIGATION INTO INFORMATION
DESIGN OF NUTRITIONAL LABELS
IN MALAYSIA**

by

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for the degree of
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SATU KAJIAN REKA BENTUK INFORMASI UNTUK LABEL NUTRISI PEMAKANAN DI MALAYSIA

ABSTRAK

Penyelidikan ini mengkaji bidang reka bentuk informasi maklumat bagi menyumbang kepada reka bentuk label pemakanan yang lebih baik di Malaysia. Secara khususnya, tiga bidang diambilkira dan dianalisa dengan lebih lanjut. Bidang-bidang itu adalah 1) elemen dan ciri reka bentuk yang digunakan dalam label nutrisi pemakanan; 2) penggunaan label nutrisi pemakanan di kalangan pengguna di Malaysia; dan 3) parti pengurusan termasuk pihak berkepentingan seperti pengawal selia, pengeluar, pencipta, pengamal reka bentuk dan penyelidik yang berkaitan dengan label nutrisi pemakanan di Malaysia. Kajian ini menggunakan kaedah bercampur termasuk menilai reka bentuk label nutrisi pemakanan yang sedia ada di Malaysia melalui satu analisis kandungan, iaitu mengukur penggunaan label nutrisi pemakanan di kalangan pengguna, dan mengumpul pandangan pihak berkepentingan melalui temubual. Hasilnya, didapati berlaku percanggahan dalam unsur-unsur maklumat (dari segi persembahan format dan sistem perlabelan) dan elemen visual (tipografi, warna dan persembahan pek hadapan) yang digunakan dalam kategori produk makanan yang sama. Kajian ini mendedahkan bahawa format yang kurang konsisten tidak membantu majoriti pengguna menggunakan label nutrisi (92.5%). Tambahan lagi, berdasarkan pilihan pengguna untuk setiap reka bentuk elemen pula, mendedahkan perbezaan antara reka bentuk label nutrisi pemakanan yang sedia ada. Rata-rata pengguna (86.7%) bersetuju reka bentuk label nutrisi pemakanan yang sedia ada perlu diperbaiki supaya penggunaannya dapat dipertingkatkan. Pihak berkepentingan mengakui ketidakselarasan itu mungkin disebabkan kekurangan penguatkuasaan yang perlu diuruskan dengan lebih baik. Cabaran seperti kekurangan

panduan untuk membimbing reka bentuk label nutrisi pemakanan juga perlu ditekankan. Kesimpulannya, kajian ini menegaskan bahawa reka bentuk label nutrisi pemakanan boleh dipertingkatkan lagi jika perhatian diberikan kepada reka bentuk informasi maklumat. Oleh itu, penambahbaikan reka bentuk informasi pada label nutrisi amat penting untuk membantu pengguna membuat pemilihan keputusan yang lebih baik.

AN INVESTIGATION INTO INFORMATION DESIGN OF NUTRITIONAL LABELS IN MALAYSIA

ABSTRACT

This research investigates information design of nutritional labels in Malaysia. In particular, three areas are further examined including: 1) the elements and design features applied in the nutritional labels; 2) the use of nutritional labels among Malaysian consumers; and 3) the governance parties including key stakeholders such as regulators, producers, creators, design practitioners and researchers related to nutritional labels in Malaysia. Objectively, this study employs a mixed method including evaluating the existing nutritional labels design in Malaysia through content analysis, surveying the use of nutritional labels among consumers, and the views of key stakeholders are gathered in interviews. Results reveal inconsistencies occur in informational elements (format presentation and labelling system) and visual elements (typography, colour and FoP presentation) applied within the same category of food products. Not only the inconsistency is evident in burdening consumers (92.5%), their preferences for each element disclose dissimilarity with the existing nutritional labels design, and deem it necessary to improve to aid their use (86.7%). Although key stakeholders acknowledge the inconsistency could be due to loose enforcement which should be better managed, underlying challenges including the lack of proper guidance in nutritional labels design and understanding to information design are also highlighted. In conclusion, this study underlines the design of nutritional labels could be further improved if attention is given to information design. Thus, this study suggests an improved information design of labels will enhance better decision making for consumers.

CHAPTER 1

1.1 INTRODUCTION

This research aims to investigate information design to contribute to better the designing of nutritional labels in Malaysia. In particular, three areas are further examined including: the elements and design features applied in the nutritional labels; the use of nutritional labels among Malaysian consumers; and the governance parties including key stakeholders such as regulators, producers, creators, design practitioners and researchers related to nutritional labels in Malaysia.

With the enormous economic development and the fast-paced lifestyles picking up in Malaysia, the increasing demand for pre-packaged food is parallel between produced, purchased, and consumed. While less time is available for food shopping, nutritional label is seen as a tool to describe the nutritional quality of food factually and informatively (Tee et al., 2002). As nutritional label is widely gauge as one of the most promising instruments to inform food choices (“Centre for Food Safety – Food Legislation/ Guidelines”, n.d.), it has not only been made compulsory for pre-packaged food products in Malaysia since 2003 (Tee, 2011), the Health Expert Committee takes it further to make nutritional labels as means to educate the public about the impact of the use to one’s health.

As a vehicle to communicate information and assists consumers making informed and healthy dietary choice (Ollberding, Wolf, & Contento, 2011; McGuire, 2012), the prevalence to reach at least 50 percent of nutritional label purpose remains a struggle among most general Malaysian populations (Campos, Doxey, & Hammond, 2011). Number of studies examined to tackle this issue associate to common factors such as insufficient level of education, monthly household income,

and marital status (Besler, Buyuktuncer, & Uyar, 2012; Mhurchu, & Gorton, 2007; De La Cruz-Gongora et al., 2012).

There is also a large study examining the association of use with motivation between genders, geographical settlement and cultural background (Wan Abdul Manan et al., 2012; Mahgoub, Lesoli, & Gobotswang, 2007; Themba, & Tanjo, 2013; Schupp, Gillespie, & Reed, 1998; Shine, O'Reilly, & O'Sullivan, 1997). While these in-depth research studies investigate mixed factors for insight of label use, the Government bodies and health advocates pin the lack of use issue as the consumers' responsibilities (*Guide to Nutrition Labelling and Claims*, 2010).

While it is likely that consumers may be responsible in playing an active role to use nutritional labels for better dietary choice, it is equally possible to question if the nutritional labels are suitably designed, as advocated by Malaysian labelling regulations and requirement, to assist in its proper usage. According to Ritter, Baxter, & Churchill (2014), there is often a fundamental error made by the health advocates assuming that the use of nutritional labels can be drawn from imagining how it will be used. This error presumes that everyone uses the nutritional labels the same way as a nutritionist or a trained health expert.

More often than not, the use process involves consumers to actively think about their purchase, to search for information, assess a considerable amount of information given, and invest time and skills in weighing different options (Geiger, Wyse, Parent, & Hansen, 1991; Scott, & Worsley, 1994). Consequently, poor decision making and lack of interest to use labels are inevitable among the many task-facing consumers (Malhotra, Jain, & Lagakos, 1982; Keller, & Staelin, 1987). Empirical evidences suggest that the key determinants to enlighten the process of using nutritional labels are associated to information design. The way a nutritional

label is designed and how the information is presented, carry a considerable amount of influence to the use among consumers (Annunziata, Pomarici, Vecchio, & Mariani, 2016).

Given the important influence of information design as abovementioned, this study investigates three vital areas in relation to the information design of the existing nutritional labels in Malaysia. Firstly, the elements and design features applied in the nutritional labels are evaluated. According to Leborg (2006), nutritional label is where people experience design every day, thus, not only do design carry a considerable amount to influence the use, the way information is presented also plays a major factor. Secondly, Graham et al (2012) stress that the users' opinions is another essential component to be sorted in order to account for these needs. Hence, this study further examines the views of consumers towards the use of nutritional labels. Thirdly, the labelling regulations and requirements necessitate a guide to be complied in the design of nutritional labels in Malaysia. This is therefore examined to add depth and understanding to this study.

Two points need to be highlighted to provide some background context about this study. Firstly, it is essential to mention that the Malaysia regulations were based on the documents of Food Regulations (regulations and requirement of nutrition labelling) which was first introduced in 1985 and gleaned from Ministry of Health (MOH). Secondly, this study entails multidisciplinary area, thus there are several disciplines that had to be incorporated in order to study the influence of the information design in nutritional labels. I am aware of the difficulties in incorporating the different approaches taken by these disciplines to adopt into this study, and I may therefore have stated the obvious in some cases. However, some of these very obvious points needed to be mentioned in order to describe other points.

1.2 RESEARCH PROBLEM

Annunziata et al (2016) argue that a nutritional label is much more than just science of any nutrient individuals should consume, but the components of information design such as informational elements and visual elements are vital (Cowburn and Stockley, 2005). Thus, the way a nutritional label is designed and how the information is presented carry a considerable amount of influence to use, read and making informed choices (Campos, Doxey and Hammond, 2011). However, when nutritional label design is often seen as a non-creative job, consumers expect the information in this area to be tedious, rendering it ineffectual (Bohm, 2014). Not only there is a lack of published research that emphasizes on the design of nutrition labels, the concern to the label's design effectiveness, alas, have been given little attention. This issue is interrelated to several dimensions including the use between consumers, and the governance parties including key stakeholders such as regulators, producers, creators, design practitioners and researchers related to nutritional labels.

While empirical studies conclude that the use of nutritional labels can significantly change dietary patterns and are able to avoid 'unhealthy' intake (De Magistrisi et al. 2010), the recognition did not seem to encourage the prevalence of use among the general populations (Campos, Doxey & Hammond, 2011). Particularly in Malaysia, not only the use of nutritional label is lagging far behind its neighbouring countries (AC Nielsen, 2005), there were only 36 percent of Malaysian consumers who *claimed* to use nutritional labels during purchasing activity (Ghazali et al., 2015; The Star, 2011), while 19.3 percent of Malaysians are not even aware of its existence on the food package (Feunekes, Gortemaker, Willems, Lion, & vanden Kommer, 2008).

Guthrie (1998) defined the use as: 'to search, extract and obtain information'. Not only the knowledge, attitude and practice of the user with a document play a factor to the acquisition of information, more often than not, the use is highly resulted in the way a nutritional label is designed and how the information is presented to the users. However, this process is generally regulated and influenced by the labelling requirement stipulated in Malaysia Food Regulations 1985. Whilst these requirements are put in place to assist food industry and regulatory authorities to refer and comply to during the creation of nutritional labels, the debate on whether the food industry can be guided in a clear way to design the nutritional labels, and if consumers are reassured that the nutritional labels are designed to aid their use remained unanswered.

In general, there are two types of nutritional label advocated by the Ministry of Health in Malaysia. The first type is the Tabular format or as some called it back-of-pack (BoP) (Singh, 2013), while the second type includes a voluntarily design to be placed at the front-of-pack (FoP), delivering nutrition information to consumers in various graphic formats (Schor, Maniscalco, Tuttle, Alligood, & Reinhard Kapsak, 2010). There are also other types of design that can be largely found in Malaysia retail outlets in recent years, which have been modified by several food manufacturers and retailers. These types include Colour-coded Guideline Daily Allowance (GDA) (Synovate, 2005) and Hybrid format which comes with additional FoP in various forms of graphic presentation (FLABEL News, n.d.). With multiple design of nutritional label appearing in the marketplace to give more visibility to consumers, the concerns with multiplicity could be a burden to consumers is however less discussed in the country.

Tabular format. The Tabular formats are mostly presented in grayscale with varied number of nutrient composition (some more, some less). Its presentation of information is not prescribed, which includes the use of columns or tables, or simple thick or thin lines to create a division. According to the current labelling requirement, “Only non-serif font is allowed (Part IV, No.11 Particulars in the labelling in Food Regulations, 1985).” The requirement posts an open question to which type of non-serif fonts should be used is undetermined. van der Waarde (1999) stress that the guidelines for font choice should be treated with some skepticism because the ultimate aim of any typography is to support readers, not adding extra burden when it is used. However, the choice of non-serif typefaces in Tabular format seemed varied, both upper and lower cases are also applied differently (fig. 1).



Figure 1. Examples of Tabular Format.

With the growing literatures about types of nutritional label application conducted globally, one common issue pointed out that majority of the consumers expressed Tabular format confusing, especially on the numerical information and the terminology used (Cowburn, & Stockley, 2005; Singh, 2013; Shine, O’Reilly, &

O’Sullivan, 1997). Their review showed that consumers had difficulty converting, interpreting and comparing information. Similarly in Malaysia, research highlighted that most of the consumers (68.1%) preferred the Tabular format to be revised due to difficulty in understanding (43.1%), and nutritional information was perceived to be insufficient (23.3%) and over simplified (21.6%) (Fatimah, Nik Ismail, & Tee, 2010).

In addition, Koh, & Rahman (2014) pointed out that the format presentation of Tabular also revealed design problem in the unclear use of hierarchy where it offers little cue about how the information should be used to achieve a single decision. Although the used of columns, tables, thick, and thin lines intend to provide visual hierarchy, Clinical Trials Research Unit (2007) argues that format such as Tabular had neither spared consumers the same proficiency to grasp the information like a health expert, nor guide consumers on how the information can best be utilised. More importantly, they stressed that consumers are expecting a nutritional label design that is simpler and easier to use, not a document that required skills in calculating amounts.

Colour-coded GDA. There are two significant aspects in Colour-coded Guideline Daily Allowance (GDA) format. Firstly, it often comes with an additional panel display at the bottom or side of the nutrition facts to indicate the GDA. Secondly, this format often used the shade of a single colour background, highlighting the nutrition information (Synovate, 2005), whereby the texts are applied in either darker and/ or lighter shades that contrast with its background (fig. 2). Although the current labelling requirement advised that “*All letters shall appear in a colour that contrasts strongly with its background (Part IV, No.13.7 Size and colour of letters in Food Regulations, 1985),*” yet, ‘strong contrast’ is not clearly

defined. According to literature (Rusko, 2003; Kiesvaara and Kivikataja, 1988; Näsänen, 2007; Wogalter, & Vigilante, 2003), if factors of contrast is not carefully considered, it can significantly cause obstruction to reading speed and disturbance to interpretation of information.



Figure 2. Examples of Colour-coded GDA format.

A review done by National Heart Forum (Lobstein, Landon, & Lincoln, 2007) underlined three issues of this format. Firstly, the GDA format does not distinguish maximum, minimum and average recommended amounts. Such ambiguity is designed in a way to only give consumers the impression of ‘ideal’ intake, instead of helping them to achieve a greater part of their decision. Secondly, the colour coding of portion sizes which often determined by manufacturers lead to misleading quantities and puts marketing benefits ahead of public health. As a result, this lead to the third issue where inconsistent format of colour coding does not help quicken consumers’ appraisal and interpretation. Their review discloses the urgency from the health department to scrutinise these issues because it is consumer’s right to have easy-to-understand information; at the same time products which carry such format are also exported widely to many countries where their citizens are most likely to be facing the same issues.

Although the empirical evidence is equivocal in Malaysia, there is some indication that Colour-coded GDA format is more preferred among Malaysian consumers when compared to Tabular and Hybrid formats (Fatimah, Nik Ismail, & Tee, 2010). However, though their findings show that such preference only appears to perform best for people who prefers more detailed information, it does not necessarily lead to correct interpretation of the nutrition information (Grunert, & Wills, 2007). Furthermore, in Colour-coded GDA format, the use of darker and/ or lighter colours is often employed as segregation in between each line of text. Souter (2008) pointed out that lighter colour is more likely to constitute to critical issue such as making the reading almost impossible. Holmes, Fouty, Wurtz, & Burdick (1985) also further stressed that when colour such as light or subtle scheme is used on such small print, users will find the information less accessible and the possibility for reading may decrease, let alone expecting them to perform certain decision.

Hybrid format. It is a co-regulatory scheme between the health government and multistakeholder in Malaysia (IFBA, 2014). Hybrid format generally combines the characteristics of Tabular Format, Colour-coded GDA format, and with an additional FoP system (*Food Labelling, 2015*). The additional FoP system summarises the key nutrition aspects presented with various forms of graphic (Wartella, Lichtenstein, & Boon, 2010). Within the range of Hybrid format, there are three examples as seen in Figure 3 include the following: a Colour-coded GDA label with percentage indication (fig. 3A); a label with Colour-coded summary of each intake (fig. 3B); and a label with graphic indicator for food allergens (fig. 3C). Each of this example indicates various styles to inform its nutritional information differently.

TOMATO SAUCE

- * than Tesco Choice Baked Beans in Tomato Sauce
- Source of fibre
- A low fat Food
- No added colouring substance

Serving Suggestion

Maklumat Pemakanan / Nutrition Information

	Setiap 100g/ Per 100g	Setiap Hidangan/ Per Serving (33)
Nilai Hidangan/Energy/Calories	71 kcal/cal	38 kcal/cal
Average Composition		
Tenaga/Energy	3.9g	2.1g
Karbohidrat/Carbohydrate	13.5g	7.2g
Jumlah Gula/Tota Sugar	3.3g	1.7g
Lemak/Fat	0.2g	0.1g
Lemak Monosaturat/Monounsaturated Fat	0.9g	0.5g
Lemak Polihidratat/Polyunsaturated Fat	0.1g	0.1g
Lemak Tepu/Saturated Fat	0.1g	0g
Asid Lemak/Lemak/Fatty Acids	0g	0g
Jumlah Serat Diet/ Total Dietary Fibre	5.5g	2.9g
Natrium/Sodium	37mg	19mg

Satu Hidangan Mengandungi Kandungan Garam Bersamaan 0.5g.
A Serving Contains The Following Of 0.5g Of Salt.

**Garis Panduan Jumlah Nutrien Untuk Dewasa /
Guideline Daily Amounts for a Typical Adult**

Gas Panduan/ Amount Daily Amount	Setiap Hidangan/ Per Serving Daily Amount	% Gas Panduan/ % Guide Daily Amount
Kalori/Calories	2000 kkal/cal	38 kkal/cal
Gula/Sugar	25g	6.8%
Lemak/Fat	70g	1%
Lemak Tepu/Saturated Fat	20g	<1%
Garam/Salt	6g	9%

Each Serving (33g) baked beans Contains

	Value	% Daily Amount
Calories	38	2%
Sugar	1.7g	2%
Fat	0.1g	<1%
Saturated Fat	Trace	<1%
Salt	0.5g	8%

425g
Berk Bersih/
Net Weight

9 555216 1560783

A

MAKLUMAT PEMAKANAN / NUTRITION FACTS

Saiz Hidangan / Serving Size : 20g
Hidangan Setiap Bungkusan / Serving Per Package : 23

	Per 100g	Setiap Hidangan / Per Serving
Tenaga / Energy	332kcal	66kcal
Karbohidret / Carbohydrate	58.0g	11.6g
Protein	2.3g	0.5g
Lemak / Fat	10.0g	2.0g
Kolesterol / Cholesterol	0mg	0mg

RAMUAN :
Gula, Air, Pepejal Susu, Minyak Kelapa Sawit, Maltodekstrin, Laktosa, Mengandungi Penstabil Sebagai Kondisioner Makanan Yang Dibenarkan.

INGREDIENTS :
Sugar, Water, Milk Solids, Palm Oil, Maltodextrin, Lactose, Contains Stabilizers as Permitted Food Conditioner.

SWEETENI
**Coffee &
Tarik Tea**

Each Teaspoon (5g) Of Sweetened Creamer Contains

Energy	Carbohydrate	Protein	Fat
20 kcal	3.5g	0.1g	0.6g

B

NUTRITION FACTS / FAKTA NUTRISI

Serving Size / Saiz Hidangan: 50g
Serving Per Pack / Hidangan Per Pak: 35

	Per 100g	Per Serving/ Per Hidangan
Energy / Tenaga	326kcal	65kcal
Carbohydrate / Karbohidret	58.0g	11.6g
Protein	1.0g	0.5g
Fat / Lemak	10.0g	2.0g
Cholesterol / Kolesterol	0mg	0mg
Vitamin A	240µg	48µg
Vitamin B1	1.0mg	0.2mg
Vitamin B2	0.8mg	0.2mg
Vitamin C	20.0mg	4.0mg
Vitamin D	3.5µg	0.7µg
Vitamin E	8.0mg	1.6mg
Calcium / Kalsium	185mg	37mg

Ingredients / Ramuan:
Sugar, Non-Fat Milk Solids (Contains Milk), Milk Fat (Contains Milk) and Palm Oil.
Contains Emulsifier and Stabilizers as Permitted Food Conditioner.
Gula, Pepejal Susu Tanpa Lemak (Mengandungi susu), Lemak Susu (Mengandungi susu) dan Minyak Kelapa Sawit.
Mengandungi Pengemulsi dan Penstabil sebagai Kondisioner Makanan yang Dibenarkan.

Caution / Amaran:
Not suitable for infants.
Tidak sesuai untuk bayi.

Storage / Penyimpanan:
Store in cool and dry place.
Simpan di tempat yang dingin dan kering.

Krimer M Bervitan

Makanan Yang Bebas Sumber bagi Vitamin D, E dan Kalsium

FOOD ALLERGENS / ALAHAN MAKANAN

	Egg/ Telur	Milk/ Susu	Gluten/ Gluten	Soyfood/ Makanan Lentul	Soy/ Soya	Nuts/ Kacang
Contains / Mengandungi	✓	✓	✓	✓	✓	✓
Not Contains / Tidak Mengandungi	✓	✓	✓	✓	✓	✓

C

Figure 3. Examples of Hybrid format include A: colour-coded GDA with percentage, B: colour-coded summary of each intake, and C: graphic indicator for food allergens.

While Hybrid format is a co-regulatory scheme, the food products that carry such format are mainly imported and can be found nationwide in Malaysia. In one of the reports (Fatimah, Nik Ismail, & Tee, 2010) raising concerns about Hybrid format for Malaysians disclosed the shortcoming of the format that attempts to classify food as direct measure by assigning colour indicators – typically in red (high), yellow (medium) and green (low), consequently encourage consumers to lower the perceived nutritional value of food. Whilst it was clear that the positioning of Hybrid format can somehow help consumers in a time saving manner, directing consumers to make quick judgement without carefully consider the food value is nonetheless unethical.

In addition, Bettman (1979) suggested that the extend of information use highly depends on external stimuli. While Hybrid format displays quite a number of design elements, both in informational and visual on single label, the issue of ‘more elements is always better’ is arguable. According to Graham, Orquin, & Visschers (2012), when a single label consists of multiple elements, text can be easily crowded out by all other information and visuals present on the label. The overcrowded elements and composition will establish an even more complex use process that leads consumers to suboptimal choices and lack of interest to use (Malhotra, 1982; Keller and Staelin, 1987).

1.3 RESEARCH QUESTIONS

With the objective to investigate how information design can contribute to better the designing of nutritional labels in Malaysia, this study intends to question:

1. What are the existing designs of nutritional labels of pre-packaged food products in Malaysia?
2. What are the informational and visual elements applied in the existing nutritional labels?
3. What are the consumers' views in using the existing nutritional labels?
4. What are the key stakeholders' views towards the existing nutritional labels?

1.4 RESEARCH OBJECTIVES

Following the abovementioned issues, the general objective of this study is to provide insights to the design of nutritional labels in Malaysia through an in-depth investigation of information design. Specifically, the objectives are:

1. To evaluate the design of the existing nutritional labels of pre-packaged food

products in Malaysia.

2. To examine the consumers' views in the use of nutritional labels of pre-packaged food products in Malaysia.
3. To gather views of key stakeholders towards the nutritional labels of pre-packaged food products in Malaysia.

1.5 SIGNIFICANCE OF RESEARCH

This study intends to contribute by bringing cumulative impact to the information design to contribute better designing of nutritional labels in Malaysia. In particular:

1. The findings of this study will add new perspectives to the importance of information design with the effect of designing the nutritional labels in Malaysia.
2. This study will provide empirical evidences regarding the use of nutritional labels to encourage a more conducive environment to the overall practice in making better-informed food choices among the stakeholders.
3. The findings highlight the benefits of having good design in nutritional labels would bring long-term implications assisting in playing a role to achieving one of the six strategic thrusts in the 11th Malaysian Plan by improving the well being of the nation.
4. This study will fills in the gap of labelling requirements by informing the health advocates and food industry the know-how of information design in the creation of nutritional labels which is benefitting to the lack of use issue.

These contributions will be a significant endeavor to the governance and development of nutritional labels, and will help raise the profile of design for the benefit of social and national good as a whole as well as for individuals.

1.6 KEY TERMS

Information Design – The term derived from Document Design consist of the overall process and practice of developing a successful document for use and the way the information is presented for its users (Holland, & Redish, n.d.).

Nutritional labels – A tool to provide factual information for nutrient content on the label of food packages and commonly used by consumers during food purchasing (Tee et. al., 2002; Cowburn, & Stockley, 2005).

Labelling regulations and requirements – A document about Food Regulations and labelling requirement which was created by groups of Expert Committees based on scientific findings. It is introduced in 1985 and extracted into a guidebook used as a quick reference for all related professional such in understanding the regulations (*Guide to Nutrition Labelling and Claims*, 2010).

1.7 CHAPTERS SUMMARY

The First chapter highlights the background of the problems under investigation in this study. Research objectives are introduced along with research questions and followed with the significance to undertake this research. Key terms are also provided to give clearer meaning in this study. The scope of the study are further explained and discussed in the following chapters.

Chapter Two is divided in three sections. The first section focuses on information design and its roles related to nutritional labels. Second section describes the use, how information are designed and other characteristics that factor the use of nutritional labels are also delineated. Section three covers the practice of governing

in labelling regulations and requirements. An overall summary is presented at the end of this chapter to highlight the key areas of this study.

Chapter Three uncovers the methodological approach designed for this study. A mixed method including content analysis, survey, and in-depth interview are employed to analyse the collected data. It included as well the detail processes of each method including selection of samples, instrument design, procedure of data collection, and approaches to data treatment.

Chapter Four presents the findings in three sections. The first section discloses the frequently applied elements of informational and visual in the nutritional labels. The second section address the insights of using nutritional labels in relation to knowledge, attitude and practice. The third section displays the views of key stakeholders towards the governance of nutritional labels.

Chapter Five provides the discussion of the study that investigates the information design of nutritional labels with key areas to the design of nutritional labels, the use among respondents, and common practices of governance. To provide a more wholistic study, issues highlighted in the first and second chapters are also discussed along this chapter.

Chapter Six concludes with some highlights and recommendations made for future research. A section for key parties are also delineated in this chapter.

CHAPTER 2

2.1 LITERATURE REVIEW

This chapter is designed in three sections to display a breadth perspective of this study. An introduction is given to information design and followed by a closer look at its relation to nutritional labels. Along this section, there roles of information design are further described and delineated respectively. The second section highlights the use of nutritional labels follow with the term ‘use’ defined. How information design influences the use and other characteristics that factors the use is also further discussed along the second section. The third section provides a brief look at the origin of nutritional labels and how it surfaces in Malaysia in order to give better understanding of the practices of governance over the years. An overall summary is presented at the end of this chapter serves as a guide to highlight the significance area of this study.

2.2 INFORMATION DESIGN

The term Information Design derived from Document Design (Holland, & Redish, n.d). During the era where technology was yet advanced, print documents such as forms, legal documents and medicine prescription were often used. Many fault-finding incidents occurred when information were given wrongly, instructions were misunderstood, and more acutely, labels were misread that lead to adverse death. In the late 70’s, the National Institute of Education (NIE) funded research project for Document Design to examine why most public documents were difficult to use, and to find out what could be done to make them better (Holland, & Redish, n.d). Since

then, Document Design gained recognition and later in the 80's, the term Information Design emerged as a multidisciplinary area of such study.

With the embracement of integrating approaches and methodologies that go beyond general documents, Waller (2008) defines Information Design as a cross-disciplinary and integrative approach. Wurman (1989), an information designer describes information design as (i) organising the patterns inherent in data, making the complex clear; (ii) creating structure map which allows others to find clear path to access the information; and (iii) addressing the needs upon clarity, understanding and science of organising information. While useful these definitions lack the deeper meaning of both information and design.

According to Holland, & Redish (n.d.), there are two meanings of information design where the difference is between the use of the term '*design*' in a broad sense, and at the same time in a narrower sense. In another words, information design is the overall process and practice of developing a successful document for use (*design in broad sense*) and the way the information is presented for its users (*design in narrower sense*) to either use many times or single time.

2.2.1 Information design in relation to nutritional labels

Lebrog (2006) relates nutritional label as part of information design. He states that choosing and buying food may never be easy; it is a process that is informed by design, and nutritional label is where people experience the design of information in both broad and narrower sense upon making certain decision in a daily context. That said, according to Weinschenk (2011), more often than not, the elements that applied in a document are regarded the mastermind to support information design to be used through the document such as nutritional label.

However, there is a lack of expansion regarding the information design in relation to nutritional labels. Generally, many scientific journals describe nutritional label as a tool to provide factual information for nutrient content on the label of food packages (Tee, 2002; Cowburn, & Stockley, 2005) and commonly used by consumers during food purchasing (Besler, Buyuktuncer, & Uyar, 2012; Blistein, & Evans, 2006). World Health Organisation defined nutrition labelling as a description intended to inform the consumers of nutritional properties of a food (Hawkes, 2004), the Government of Health Canada (Food Labelling, 2015) adherence to nutrition labelling as the information found on the labels of pre-packaged foods.

On the other hand, Centre for Food Safety in Hong Kong describes nutritional label as a systematic way of presenting nutrition information of food product. It is generally presented in a tabular format as a guide for the consumer to make selection from a list of food products and to encourage the consumption of healthy products (Centre for Food Safety – Food Legislation/Guidelines, n.d.). Even in Malaysia, by referring to Malaysia Dietary guidelines, nutritional label is defined as a list of nutrient level of a product displayed on the food label. Similarly, it is meant to provide the salient facts about the nutrition contents of the product (*Malaysian Dietary Guidelines*, 2010).

Despite the aforementioned descriptions that indicate the common definition of nutritional labels as an important aspect for scientific literature, there are nonetheless a lack of definition in the aspect of information design. In particular, the different roles of information design in both broad and narrower sense that should be emphasized is less discussed. Therefore, in section 2.2.2 and 2.2.3, it is imperative to further explain the two significant roles of information design in the nutritional labels.

2.2.2 Role of information design in ‘broad sense’

A document informed by design. Nutritional label is often perceived as a document with factual information, however with the least creativity use. In fact, it has, for too long, been lumped into the category of fact-based things that laypeople are meant to understand. According to Ritter, Baxter, & Churchill (2014), many producers make two fundamental errors by assuming that to understand how a document will be used can be derived from imagining how it will be used. This assumption is based on a second error – that everyone is the same when using and interacting with a document.

In actual fact, the revealing of information on the nutritional properties of food can be an important means of information design. It carries the components of various design elements which have a level of complexity to influence consumers to use, read and making informed choices (Cowburn, & Stockley, 2005). In another words, as much as numerical numbers, science facts and nutrient composition have to be concerned; both informational elements and visual elements such as the choice of typography, the use of colours and contrast, and the layout presentation each carries major concern for a complex document like nutrition labels to ultimately reach consumers to be used (Campos, Doxey, & Hammond, 2011).

A vehicle to communicate the use decision. Nutritional label also perform as an essential mediating texts in the communication process between the producer and consumers of a product that it supports both message and medium (Vygotsky, 1978; Vygotsky, 1979) to differentiate between individual foods and brands. It is not just a piece of paper stuck onto the product packaging but should be an expression of a number of important decisions (FDA, 1998). Nonetheless, if a food product is not

labelled, consumers may form their own beliefs based on their general knowledge of food science.

In general, it has been found that nutritional information on the label communicates behaviour during purchasing that derives from the influence of valuation and perceptions (Derby, & Levy, 2001; Drichoutis, Lazaridis, & Nayga, 2008). It does not only communicate awareness, it allows consumers to perform comparison and avoidance to negative contents. When the nutritional labels become increasingly complex, particularly as products move from the status of basic commodities to highly processed, value-added products, it also helps form judgement of a product's overall value that lead to informed decision (Achieving Higher Productivity Through GP, n.d.). Therefore, nutritional labels can be concluded as an imperative form of guide to communicate a better-informed decision.

A representation of standard and trust to key stakeholders. Nutritional label on a food label is regarded as a consumer's closet contact to a food manufacturer and only source of knowledge of the product with great deal of information (Williams, & Griswold, 2015). It offers assurance of what the product is and some information of how it was produced. Just as a company is represented by the name, it is also represented by the nutritional label on its product (Hartson, & Hogan, 2007). Therefore, nutritional labels deemed to carry a credence attribute where consumers, food industries and third party entities all play a role in determining which of a food's many attribute are described on food labels (Darby, & Karni, 1973; Nelson, 1970; Roe, & Sheldon, 2007).

Despite there is a large literature investigating whether the accuracy of information in a nutritional label is a critical part of building trust with consumers, such trust however had direct influenced to their food choices and also their use of

nutritional labels (Worsley, 2003; Drichoutis, Lazaridis, & Nayga, 2008), and consequently on the nutritional status of the population (Conveney, 2007). This is because the standard of nutrition labelling is perceived by many as a guide to monitoring the quality of product for purchase, which enables the users to rely their trust on the nutrition information, as a result, it makes the industry respected and trusted by consumers (High, & Wood, 1988). That said, the evidence on whether the scepticism towards the trust and to what extent has been unanswered (Soo-Jiuan, & Khai-Ling, 2007).

2.2.3 Role of information design in ‘narrower sense’

As previously mentioned in Chapter One, there are two types of nutritional label design and used in Malaysia. Back-of-pack (BoP) nutritional label is a common format that has been used by the food and beverage industries in representing the nutrition contents in their food products. BoP is often presented in Tabular format or some called it Linear format (“Technical Guidance on Nutrition Labelling”, 2016).

The second type includes a voluntarily format designed to be placed at the front-of-pack (FoP), delivering nutrition information to consumers in various graphic formats (Schor, Maniscalco, Tuttle, Alligood, & Reinhard Kapsak, 2010). As of 2012, the single, FoP icon for “energy”, designed in the shape of button is approved by Malaysia’s Ministry of Health. This voluntary FoP labelling system is aspire to help consumers balance their diets and lifestyles.

Apart from the two types of nutritional labels design, there are also other types of design that can be largely found in Malaysia retail outlets which have been modified by several food manufacturers and retailers. The design includes the colour-

coded GDA (Synovate, 2005), and Hybrid format which come with additional FoP in various forms of graphic presentation (FLABEL News, n.d.).

With the multivariate nutritional labels design, there are also a number of studies highlighting the challenges of the way information is designed and presented for the users (design in narrower sense). For example, the design of Tabular format presents its nutrition information that necessitate converting and calculating the nutrition amounts. Consumers are required to memorise a considerable amount of information and investing time in weighing different options during purchasing activity (Cowburn, & Stockley, 2005; (“Technical Guidance on Nutrition Labelling”, 2016; Shine, O’Reilly, & O’Sullivan, 1997).

Additionally, studies that have undertaken the investigation on Colour-coded GDA format suggest that this type of design although enables quick consumer appraisal when compare to Tabular format, yet, it seems to only perform best for people who like more detailed information (Grunert, & Wills, 2007). There are several matters that concern the ambiguity of information presentation such as misleading quantities and inconsistent use of colour are also debatable (Lobstein, Landon and Lincoln, 2007).

In contrast, Hybrid format can be argued that its information is designed and presented for easier comprehension and interpretation when compared with the other two abovementioned design (FLABEL News, n.d). Despite its advantage that does not demand consumers to have special nutrition knowledge to grasp the large amount of information, yet, the variety of information can overwhelmed consumers where suboptimal choices are likely to occur (Graham, Orquin, & Visschers, 2012).

2.3 CONSUMERS USE

Over the years, there has been an increasing interest in nutritional labels in relation to the use. For example, in 2005, AC Nielsen conducted a research in 38 countries from Europe, Asia Pacific, North America, Latin America and South Africa. The findings from the research showed that among the Asia Pacific region, Malaysia is lagging far behind Thailand (41%) and India (32%) in terms of consumers who checked the nutritional labels during the purchase of food products. While Campos, Doxey, & Hammond (2011) state that the current prevalence of nutrition-label use in most general populations should be above 50 percent: 53 percent in the US (Besler, Buyuktuncer, & Uyar, 2012), 72.3 percent in Turkey (Blistein, & Evans 2006), and 82 percent in New Zealand (Mhurchu, & Gorton, 2007).

According to the same research, the National Health and Mobility Survey (Ghazali et al., 2015) in Malaysia reported that although a total of 60 percent of consumers claimed to read the information on nutrition labels, but in fact the propensity to use nutrition labels among Malaysians is outwardly lower than the other countries like US, Turkey and New Zealand. Another report also showed that only 36 percent of Malaysian consumers look for and read nutritional labels during the food-buying process (The Star, 2011). Nevertheless, there are 19.3 percent of Malaysian consumers who do not even use nutrition labels, as they are not aware of the nutritional labels that appear at the back or side of the food packaging (Feunekes, Gortemaker, Willems, Lion, & Vanden Kommer, 2008).

It is no doubt that a growing number of studies have continuously draw attention to the use of nutritional labels, yet, these studies have not break free from the common route of investigation. Hawkes (2004) explains that the studies regarding the nutritional label especially in Asian countries were lacking and often

looking into the same direction of use because most of the ASEAN countries were still new in the implementation of food labelling regulation. In Malaysia alone, there was evidently a scarcity of studies regarding the use of nutritional labels (Norzaidi, Ramli, Jemahadi, & Razalli, 2011).

2.3.1 Defining the ‘use’

Multiple studies defined the ‘the use of nutritional labels’ as “look at the nutritional label” of the food product (Gonzalez-Roa, & Calatrava-Requena, 2008) while others define as “the frequency of reading the nutritional label (Aprile, & Annunziata, 2005; Godwin, Speller-Henderson, & Thomson, 2006). Wills, Grunert, Celemin, & Bonsmann (2009) on the other hand define as the level of usefulness with the types of most preferred nutritional labels while some literature explained the term as “an act of information searched by consumers” (Banterle, 2009; Grunert, & Wills, 2007; Grunert, Wills, & Fernandez-Celemin, 2010).

Apparently, majority of these studies in relation to the use by “looking at the nutritional label”; “frequency of reading nutritional label”; and “the level of usefulness with the types of preferred nutritional labels” all go down to the common route of investigating and connecting such use with geographical settlement and cultural background (Satia, Galanko, & Neuhouser, 2005; Nurliyana, Norazmir, & Anuar, 2011; Norazmir, Norazlanshah, Naqueyah, & Anuar, 2012). There is also a large study examine the association of use with motivation between genders, marital status and income (Wan Abdul Manan et al., 2012; Mahgoub, Lesoli, & Gobotswang, 2007; Themba, & Tanjo, 2013; Schupp, Gillespie, & Reed, 1998; Shine, O’Reilly, & O’Sullivan, 1997). There is only a handful of study examining the relation of knowledge and education level with the use of nutritional labels were

consistently conducted (Guthrie, Cleveland, & Welsh, 1995; Szykman, Bloom, & Levy, 1997; Kim, Nayga, & Capps, 2001; Drichoutis, Lazaridis, & Nayga, 2008; Themba, & Tanjo, 2013).

Despite the common route undertaken by many aforementioned studies, yet, whether these common studies have proven to help nutritional label use is somehow mixed. On another hand, the use of nutritional label in relation to “information search” is under defined and it is essential to be further examined. This is because nutritional label serves as the first reference point for search, extract and obtain information even before making purchasing decision (Drichoutis, Lazaridis, & Nayga, 2008). The search often takes place during the interaction of the user with a document and results in the acquisition of knowledge, experience or information (Guthrie, 1988).

2.3.2 Influence of information design to the nutritional label use

In order for nutritional labels to be used optimally, it is therefore essential to understand how information design can influence consumers to the willingness of use when obtaining information. Metz (1996) explained the three processes to information search: (i) the ease with which consumers are able to find and read the printed information; (ii) the legibility of the label presentation with a combination of design factors; and (iii) the overall design of the labels where its relationship to the size and shape of the product label.

A similar research is done by Rusko (2003), Kiesvaara and Kivikataja (1988), and Näsänen (2007) where the approach in 4 stages. Firstly, the information needs to be found (‘findability’). Secondly, information must be able to be read (‘readability’). Thirdly, nutritional label must be able to be interpreted