

# Parental attitudes toward weaning practices and weaning foods for health in Malaysia

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## Abstract

**Purpose** – The purpose of this paper is to gain insight on parental attitudes towards weaning practices and weaning foods for health in Malaysia using Q-methodology.

**Design/methodology/approach** – The study population was parents that had a child aged three years or less. A total of 47 parents were recruited to partake in a one-on-one activity which involved sorting 69 statements about weaning practices and weaning food products into a grid that was normally distributed ranging from “strongly disagree” to “strongly agree”. Sorting was immediately followed by a short interview to understand the reasons behind the placement of particular statements.

**Findings** – Data analysis identified three statistically distinct participant attitudes towards weaning practices and foods for health that were then interpreted using the rich qualitative data from the post-sort interviews. The attitudes identified were “All Homemade and Natural”, “Commercial Convenience and Trust” and “Balance and Variety”.

**Originality/value** – This study identified the dominant sets of attitudes held by Malaysian parents towards weaning practices and weaning foods for health using Q-methodology. To authors’ knowledge, this is the first paper focussing on weaning foods for health, specifically on functional weaning food. This new understanding of shared attitudes will allow product developers, marketers and health communicators to more effectively design their products and their marketing mix to ensure that these messages resonate well with the target audience who want to provide the best weaning foods possible for their children.

**Keywords** Consumer behaviour, Weaning, Q-methodology

**Paper type** Research paper

## Introduction

Weaning, otherwise known as complementary feeding is generally defined as the progressive introduction of solid foods other than milk (i.e. breast milk or infant formulas) (Schwartz *et al.*, 2013). Weaning enables infants to meet their nutritional requirements and regulate their appetite, whilst becoming exposed to new tastes and textures in a staged and progressive manner (Maslin *et al.*, 2015). International and national recommendations and guidelines from different countries advice different weaning strategies, and national guidelines contain culture-specific recommendations that differ from country to another (Schwartz *et al.*, 2011). Parents are offered guidance on when, what and how to wean (Hetherington *et al.*, 2011). However, advice on the introduction of weaning foods has changed over the past decade and there has been some confusion especially when advice is not consistent across varied sources (Schwartz *et al.*, 2011) and/or when maternal experience conflicts with government guidelines (Caton *et al.*, 2011).

The use of homemade vs commercially produced weaning foods has been receiving increasing interest as the use of commercial weaning food increases. The consumption of commercially prepared infant foods is very prevalent in many developed countries

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(Maslin and Venter, 2017). The increase in the use of commercial weaning food may be a reflection of modern lifestyles becoming busier, with less home cooking taking place, leading to an overall increased reliance on ready-made foods across all ages (Jabs and Devine, 2006). The value of the global baby food (infant formula and baby food) market was \$53.31bn in 2015 (Zion Market Research, 2016). Based on this market report, the global baby food market has experienced significant growth over the past few years, primarily due to rising population of working women, and their concern for good nutrition for their babies (Zion Market Research, 2016).

Despite a considerable amount of literature published on general consumption of functional foods, there is very little explicit mention of the particular role that functional foods could or should play in this weaning process (Ozen *et al.*, 2012). One study by Haschke *et al.* (2001), found that added prebiotics infant cereals which promote growth of health promoting bacteria in the gut were helpful in reducing the incidence of fever, any cold symptoms, runny nose, and severity of diarrhoea and recommended that the safety and efficacy of functional food offered to infants and toddlers should be established. Although that there is increasing consumer concern about health and an increasing array of weaning foods on the market which are being promoted as “functional”, there is no definition of “functional weaning foods” and the term “functional food” varies across countries. Several definitions of functional foods have been proposed but there is no unitary accepted definition (Tee, 2011; Alzamora *et al.*, 2005). Most countries describe functional foods to as containing bioactive components and ingredients that provide additional health benefits beyond basic requirements and capable of reducing certain diseases (Lau *et al.*, 2013).

Weaning foods is a key priority area for the development of new foods and beverages that align well with consumer mega-trends and established demographic demands for functional health foods. Parental attitudes towards weaning practices and weaning foods are important to understand, not just for the food industry so that they can develop appropriate products and target these accordingly, but also for other stakeholders involved in promoting infant health, such as governmental bodies and health practitioners through national feeding guidelines. Given that the large majority of the literature to date on parental attitudes towards weaning practices and weaning foods is Western-centric, it makes sense to investigate parental attitudes from other non-Western countries to explore which attitudes and practices are shared and which differ and how.

A number of developing Southeast Asian markets have seen an increase in consumer spending on commercial weaning foods. For example, the sales of commercial weaning food products in Malaysia increased between 2015 and 2016 from \$29.6m to 30.8m with a slight increase in sales of 3.8 per cent (Euromonitor International, 2017). Despite increased consumer spending on commercial weaning foods in developing Southeast Asian markets like Malaysia, there is surprisingly little information available to the food and beverage sector about the attitudes that influence parents’ crucial decision-making processes on what to feed their babies. Given the recent market developments and the identified potentialities for further development in this particular country, it serves as a useful starting point to start to explore parental attitudes in this part of the world.

In Malaysia, weaning food, also known as complementary food is defined as any nutrient-containing food or liquid other than breast milk, infant formula or follow-up formula given to infants from age 6 to 24 months (Ministry of Health, 2013). The current Malaysian Dietary Guidelines for Children and Adolescents states that it is ideal to give infants freshly prepared food, but if commercial foods are used, parents should read the food label including the nutrition information panel and choose weaning foods fortified with iron; and avoid weaning food products with added sugar or salt (Ministry of Health, 2013).

Given that there are no studies that focus on functional weaning food in Malaysia, the aim of the current study was to use Q-methodology to gain insight on parental attitudes towards weaning practices and weaning foods including functional weaning food (not including follow-up milk).

### Method

Attitudes are difficult to measure and there is no perfect method but Q-methodology, a qualitative and quantitative method is a robust option (Cross, 2005). This method can sample the range and the diversity of views expressed. Based on Previte *et al.* (2007), the general aim of Q-methodology is to study people's own perspectives, meanings and opinions. Q-methodology has previously been used by Zhang *et al.* (2016) where three distinct consumer perspectives that hold homogeneous viewpoints about the freshness of fruit juice were identified.

In brief, statements for the concourse were initially generated through a literature review including journal articles, reports, books, newspapers and magazines and were supplemented with statements from 13 semi-structured in-depth interviews with Malaysian parents. These interviews were conducted to obtain diverse views on weaning practices and weaning foods in Malaysia and relevant quotes were added to the concourse. A reduced set of 69 statements resulted in the final Q-set was produced in English and then in Malay through a consultative process of back-translation. Once finalised, the statements were then pre-tested with six parents to ensure that each statement was different from one to another. Even with effective piloting, there is a sense in which a Q-set can never really be complete, however, the procedural detail of Q-methodology ensures that a Q-set only needs to contain a representative condensation of information (Watts and Stenner, 2005). The aim was to include a roughly equal number of items relative to each demarcated sub-theme (Watts and Stenner, 2005).

The Q-study was conducted in four different locations in Malaysia; Sabah, Kuala Lumpur, Putrajaya and Selangor which covered both Peninsular Malaysia and East Malaysia. Parents were recruited using a purposive sampling strategy which was combined with a snowballing technique to recruit additional participants, via e-mail and phone messages with consent; and consequent word of mouth messages. Participants were all expectant parents or parents that had a child aged three years old or under. Ethical approval was obtained from the University of Otago Human Ethics Committee (Reference number: 15/114). A total of 47 parents participated and completed the Q-study.

Q-study was conducted individually at times convenient to the participants either at their home, their workplace or at a restaurant and lasted for approximately 60 min. The researcher clarified what was meant by the terms "weaning" and "weaning foods" (definitions from Schwartz *et al.*, 2013), "functional foods" (definition from Lau *et al.*, 2013) and "functional weaning foods" (definition adapted from Lau *et al.*, 2013 to suit the weaning food context). This was done by providing participants with a card containing definitions, along with photos of example products that fell into that product category:

#### Weaning.

The weaning process begins the first time baby takes food from a source other than breast milk. Weaning foods are given to a baby who is going from a milk-based diet to solid foods. They can be made at home or purchased in the market. Some weaning foods are:

- puréed or well-mashed cooked vegetables, such as potato, sweet potato, butternut squash, parsnip, carrot, courgette, broccoli or cauliflower;
- fruit purée, such as ripe cooked apple, pear, mango or papaya or mashed fruit such as ripe avocado or banana; and
- baby rice, baby cereal and baby biscuits.

Example of commercial weaning products.

Functional foods are foods that provide health benefits beyond basic nutrition. They contain bioactive components and ingredients that provide additional health and developmental benefits.

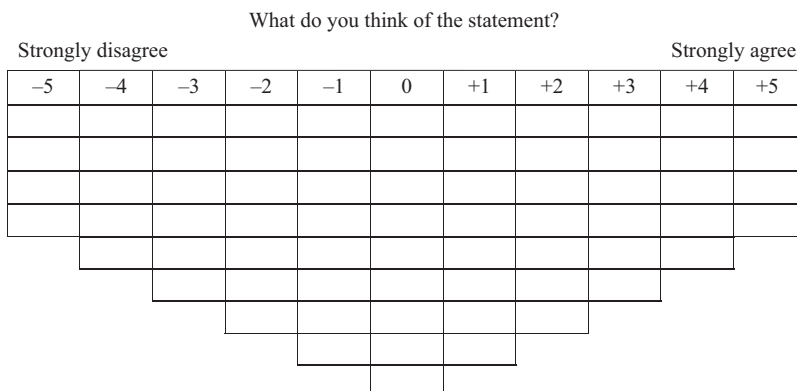
Some functional foods are:

- food fortified with additional nutrients (labelled fortified products), such as fortified with vitamin C, vitamin E, folic acid, zinc and calcium;
- food with additional new nutrients or components not normally found in a particular food (labelled enriched products), like probiotics or prebiotics;
- food from which a deleterious component has been removed, reduced or replaced by another with beneficial effects (labelled altered products), for example, fibres as fat releasers in meat or ice cream; and
- food in which one of the components have been naturally enhanced (labelled enhanced products), for example, increased omega-3 content.

Functional weaning foods are weaning foods that have functional properties and can provide health benefits beyond basic nutrition.

The participants were given the pack of 69 Q-cards (randomly shuffled) and asked to read each statement in turn and rank them from strongly agree (+5) to strongly disagree (-5), physically placing each item into a column on the Q-sorting grid board provided (Figure 1). In expressing participants' individuality through the Q-sorting procedure, participants are allowed to assign any number of items to any of the available ranking positions on the grid based on their categories (agree, neutral and disagree) meaning that although a grid board is provided they are not necessarily restricted to this format. Brown (1980) stated that giving participants a prescribed choice on sorting items have no effect on analysis (retrieving factors) and results. The completed distribution (the participant's Q-sort) was recorded. The researcher then conducted a short audio recorded post-sorting interview where participants were asked to comment on why they ranked particular statements as +5, -5 and 0. Parents were also asked if there is information that they wanted to share that is not included in the Q-set or other topics that should be added in the Q-set. Overall, the parents were satisfied with the Q-set.

Data were input, managed and analysed using PQMethod version 2.35. Factor analysis results in the grouping of expressed opinion profiles based on the similarities and differences in which the statements are arranged by each participant (Brown, 1993).



**Figure 1.**  
The Q-sorting grid used for the Q-study statement sorting activity

Factor analysis is used to correlate participants Q-sorts in order to identify which participants Q-sorts cluster together. Factors were extracted using principal components analysis, which maximises similarities within factors and differences between them. Varimax rotation was used, which rotates factors to ensure that no Q-sort loads significantly at the same level on more than one factor (Watts and Stenner, 2005).

Following rotation, Q-sorts that were exemplars of each factor were identified. Only those Q-sorts with a loading of 0.44 ( $p < 0.01$ ) on one factor were retained as exemplars (Watts and Stenner, 2005). The identified exemplars Q-sorts were merged to create factor arrays (an average score for each item by a factor) using a weighting formula devised by Spearman (Brown, 1980). Four factors were originally extracted, with an eigenvalue of 1.00 or more (Brown, 1980). The final selection of a three-factor solution was reached after inspection of factor four showed that it did not provide a viewpoint that was distinct from those captured in the other three factors. Watts and Stenner (2005) recommended that factors should explain upwards of 35–40 per cent of the data, hence, the three factors were kept.

Based on Watts and Stenner (2005), the standard requirement is that an interpretable Q methodological factor must ordinarily have at least two Q-sorts that load significantly upon it alone and that confounded Q-sorts (which load significantly on two or more factors) are excluded from the weighted averaging procedure. Hence, the analysis of the current study revealed that one participant's Q-sort was non-significant (i.e. not correlating with any of the emerging factors) and five participants' Q-sorts were confounding (i.e. correlating significantly with more than one factor) which then left data from 41 participants usable (87 per cent of original data).

A final factor array was produced for each of the three remaining factors by merging factor exemplars to form a single "ideal" Q-sort to best represent the factor (Stenner *et al.*, 2003). The resulting factor arrays are idealised Q-sorts representing a particular viewpoint or account and are the main output of the statistical analysis which is taken forward for interpretation. As Q-methodology cannot be used to estimate population statistics or to make claims about the percentage of people expressing them, the three factors found in this study cannot be generalised to the wider population with any statistical certainty. The focus of the research is on the content of the factor (the range of views about weaning and weaning foods) and not the characteristics of the participants. The results of the thematic analysis of the distribution of statements particular to each group, as well as of the post-sort interview material, helped to create a narrative to represent each group.

## Results

The three significant factors representing different sets of attitudes held about weaning and weaning foods were: Factor I "All Homemade and Natural", Factor II "Commercial Convenience and Trust"; and Factor III "Balance and Variety". These three factors explained 51 per cent of the variance between all of the sorts: factor I (17 per cent), factor II (14 per cent) and factor III (20 per cent), respectively. Demographic information for participants is presented in Table I. According to the Q-study standard (Brown, 1980; Watts and Stenner, 2005), factor arrays of scores against each statement by factor with grid position are shown in Table II. For each group, the researchers created a narrative that reflected the point of view in first person to represent each group's viewpoint as provided below.

Factor narratives created by researchers where narrative reflected the point of view in first person to represent each group's viewpoint:

### All Homemade & Natural

I believe homemade weaning foods are healthier and more nutritious than commercial weaning foods. Commercial products contain preservatives and unnecessary ingredients such as salt

	Factor I "All homemade and natural" (n = 14)	Factor II "Commercial convenience and trust" (n = 10)	Factor III "Balance and variety" (n = 17)
<i>Parent</i>			
Mother	13	4	16
Father	1	6	1
<i>Location</i>			
Sabah	9	4	11
Kuala Lumpur/Selangor/Putrajaya	5	6	6
<i>Age</i>			
19–29	4	1	5
30–39	10	8	9
40–49	–	1	3
<i>Parity</i>			
One child	9	5	8
Multiparous	5	5	9
<i>Age of youngest child</i>			
Below 1 year	9	7	6
Below 2 years	2	–	7
2–3 years	3	3	4
<i>Ethnicity</i>			
Bumiputra	10	10	16
Non-bumiputra	4	–	1
<i>Education</i>			
Primary	–	–	1
Secondary	–	1	2
Tertiary	8	6	11
Higher tertiary	6	3	3
<i>Occupation</i>			
Others	11	10	15
Housewife	3	–	2
<i>Monthly income (RM)</i>			
Below 1,000	3	1	2
1,000–1,999	1	1	5
2,000–2,999	1	1	2
3,000–3,999	2	2	5
4,000 and above	7	5	3

**Table I.**  
Demographic information for participants in the three factors

and sugar that are not needed. For me, to make weaning food from scratch is a smarter choice than purchase instant food such as functional weaning foods. I do not trust the promised benefits of functional weaning foods. I do not believe that functional weaning foods are better than the conventional products and I do not think that my baby needs functional weaning foods. I purchase commercial weaning food products as a backup option only as I prefer to make homemade weaning food. I strongly agree that baby should be given homemade weaning food every day and that they are easy to prepare. Homemade weaning foods are good enough for my baby's diet.

#### Commercial Convenience & Trust

It is difficult to make homemade weaning food and it is time-consuming as my husband and I are both working and busy. I prefer to purchase and feed my baby commercial products.

No. Statements	Factor I "All homemade and natural"	Factor II "Commercial convenience and trust"	Factor III "Balance and variety"
1 Weaning foods should be introduced to babies when they are 6 months old	3	5	4
2 It is acceptable to introduce weaning food to babies when they are less than 6 months old	-4	0*	-5
3 Weaning foods should be introduced to babies based on the advice from a health professional	2	1	3*
4 Babies should be given homemade weaning food every day	2*	-4*	4*
5 Solid weaning foods are preferable to liquid weaning foods because babies can feed themselves	-4*	-1	0
6 Homemade pureed vegetables and fruits are a good first weaning food	5	1*	5
7 Commercial weaning food should not be given as first weaning food	2*	-1*	1*
8 Babies prefer commercial weaning foods more than homemade weaning foods	-3	-2	-4
9 Homemade weaning foods are healthier than commercial weaning foods	4	0*	5
10 Commercial weaning foods are more nutritious than homemade weaning foods	-5	-3*	-5
11 Homemade weaning foods are cheaper than commercial weaning foods	3	2	3
12 Preparing homemade weaning foods is more difficult than buying commercial weaning foods	1	2	-5*
13 Preparing homemade weaning foods is more time consuming than buying commercial weaning foods	1*	3*	-1*
14 Commercial weaning foods are more convenient than homemade weaning foods	0	3*	0
15 Most commercial weaning foods contain preservatives and additives	4*	-2*	2*
16 Most commercial weaning foods have a high sugar and salt content	4*	-2*	2*
17 The ingredients inside commercial weaning foods are known and familiar	-2*	-1	0
18 Homemade weaning foods are fresher and more natural than commercial weaning foods	5	5	5
19 The process involved in making commercial weaning foods is unfamiliar	2	1	0
20 Easy digestion is an important factor to consider when purchasing commercial weaning foods	4	5	4
21 When purchasing commercial weaning foods, taste is an important factor	0	1	-1
22 When using commercial weaning foods, the baby's reaction (like/dislike) is the most important factor	3	3	2
23 When purchasing commercial weaning foods, the brand is an important factor	1	1	-3*
24 When purchasing commercial weaning foods, the price is an important factor	0	2	-2*
25 When purchasing commercial weaning foods, ingredients are an important factor	4	4	4

**Table II.**  
Factor arrays: scores against each statement by factor with grid position

(continued)

No. Statements	Factor I “All homemade and natural”	Factor II “Commercial convenience and trust”	Factor III “Balance and variety”	
26	When purchasing commercial weaning foods, quality is an important factor	5	4	3
27	The Ministry of Health guidelines on infant feeding practices can't be trusted	-5	-5	-5
28	The Ministry of Health guidelines on infant feeding practices is easy to follow	0	0	3*
29	Not enough information is provided in the Ministry of Health guidelines on infant feeding practice.	0*	-2*	-3*
30	Parents should follow their intuition and feelings on infant feeding practices	1*	-3	-3
31	Books and the internet are a good source on infant feeding practices	3	4	3
32	Past experiences on infant feeding practices are a good source of information	3	4	3
33	Advice from health professionals' on infant feeding practice is more reliable than advice from other sources	1	2	2
34	Advice on infant feeding practice from family and friends' is unreliable	-2*	-5*	-4*
35	It is essential that a baby has a healthy diet	5	5	5
36	It is more important for a baby to have a healthy diet than for their parents to have one	2*	0	0
37	It is impractical to make healthy weaning foods and the family meal at the same time	-2	-4	-3
38	Eating healthily is important but the lack of time and/or energy to do this	1*	4*	-1*
39	The more healthy the food, the more it will cost	-1*	1	0
40	Sometimes, convenience takes over from a healthier option	2	0	-2*
41	Health claims on commercial weaning foods can be trusted	-1	-2	-1
42	Functional foods provide health benefits beyond basic nutrients	0	1	-1
43	Functional foods are sufficiently promoted and merchandised	0	2*	0
44	Functional foods are not safe to eat	-4	-5*	-4
45	Functional food products are of higher quality than conventional food products	-2*	1	1
46	Functional food products are healthier than conventional alternatives	-3	-2	-1
47	Functional foods are worth a premium price	-1	-1	-2
48	The promised benefits of functional foods can be trusted	-3*	-1	1
49	Functional foods are visually appealing	1	-1	1
50	Functional foods taste good	0	0	1
51	Functional foods are not real genuine food	1*	-4*	-2*
52	Consuming functional food is part of the ethnic culture	-1	-3	-4
53	It is difficult to differentiate between functional foods and non-functional foods	-3*	-2	-1
54	Functional weaning foods are good	-1	0	1
55	It is smart to purchase functional weaning foods	-3*	2	1

(continued)

Table II.



No.	Statements	Factor I "All homemade and natural"	Factor II "Commercial convenience and trust"	Factor III "Balance and variety"
56	Functional weaning foods are affordable	-1	-1	1
57	Functional weaning foods are unnecessary for babies	0*	-4*	-4*
58	Functional weaning foods are not readily available in the market	-4	-3	-3
59	Functional weaning foods are only needed if a baby has a particular health concern	-3	-4*	-3
60	Parents prefer natural weaning foods compared to functional weaning foods	3	-1*	4
61	There is little information provided by the media or health advisory boards regarding functional weaning foods	2*	0*	-2*
62	A baby's health and growth development can be taken care of by the consumption of functional weaning foods	-5*	3*	0*
63	Functional weaning foods can better support the physical growth of babies than non-functional weaning foods	-5*	2	2
64	Functional weaning foods are more likely to support the mental development of babies than non-functional weaning foods	-4*	3*	2*
65	Functional weaning foods contain key healthy ingredients that make a balanced diet easy for babies	-1*	3	2
66	Functional weaning foods are desirable	-2*	0	0
67	Functional weaning foods are sold in speciality shops rather than conventional supermarkets	-2	-3	-1
68	Functional weaning foods are not regulated enough	-1	-3	-2
69	Functional weaning foods are only needed if a baby suffers from malnutrition	-2	-5*	-2

**Notes:** Statements with extreme scores are those ranked -4 or -5 "Strongly disagree" and +4 or +5 "strongly agree." 0 represents the midpoint and so represents a neutral reaction to the statement ("neither disagree nor agree"). Shaded boxes are shared viewpoints (statements that had consensus across two or all three factors with a significance level of  $p < 0.01$ ). Factors with \*indicate a distinguishing statement for a particular factor (statements the factor ranked differently to other factors at a significance level of  $p < 0.01$ )

Table II.

Commercial weaning foods contain ingredients that are not available in homemade weaning foods and they get a variety of products with different ingredients. Not all commercial weaning foods contain preservatives, additives and have high salt and sugar content. Both commercial and homemade weaning foods are healthy in their own way. I strongly believe that functional weaning foods are necessary for babies and it is smart to purchase them. They wouldn't make a claim if it was not true as the manufacturers need to follow the food standard and be certified by the Ministry of Health. I trust that functional weaning foods contain key healthy ingredients that provide a balanced diet for the development of my baby.

#### Balance & Variety

I make and give homemade weaning foods to my baby every day. It is not difficult to prepare them. Homemade weaning foods are healthier. But, I also purchase and give commercial weaning foods as part of my baby's diet. The commercial weaning foods in the market nowadays are good and have a lot of variety. Commercial weaning foods give more options to me besides making weaning food at home. I want my baby to have a balance and variety of weaning foods. I agree that functional

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weaning foods are needed not only when my baby has a particular health concern or malnutrition. I believe that functional weaning foods can help the development and can provide balance to my baby's diet.

A total of 14 parents loaded significantly in factor I. This group holds a generally positive attitude towards homemade weaning foods and a generally negative attitude towards commercial weaning foods and functional weaning foods. There were ten defining participants that are significantly associated with factor II. The group tended to be favourable to commercial weaning foods and functional weaning foods. There were 17 parents loaded significantly factor III. While this group held a strong positive attitude towards homemade weaning foods, they also held a slightly positive attitude to both commercial weaning foods, as well as functional weaning foods. Despite the distinctive characteristics of the three factors as described above, the parents also had attitudes in common. When the parents were asked about baby's diet, the majority commented that it was important that a baby has a healthy diet (+5) and strongly agreed that homemade weaning foods were fresher and more natural than commercial weaning foods (+5) as they were aware that commercial weaning foods are processed foods. Hence, parents' main concern on commercial weaning foods is the ingredients in the products (+4) such as the main content of the product, sugar content and unnecessary ingredients. There appears to be a lot of trust in the guidelines on infant feeding practices provided by the Ministry of Health Malaysia, with participants in each factor strongly disagreeing with the statement that they "can't be trusted" (-5).

## Discussion

### *Guidelines and information*

Factor I and factor III parents were adamant that it was important to adhere to the recommendation by the World Health Organisation, Malaysian Dietary Guidelines and health professionals to "avoid giving food to babies below 6 months". However, there were a few parents in factor II introduced solid foods to their babies below the recommendation age. The main reasons for this were insufficient breast milk and infant hunger and these results are in line with previous studies (Brown and Rowan, 2015).

Parents used different sources of information on weaning practices, with the Ministry of Health Malaysia as a key provider. Although all of the parents said that they trusted guidelines from the Ministry of Health Malaysia, some of the parents did indicate that they felt that the information provided in the guidelines was not enough and a number of parents were simply unaware of the existence of the guidelines altogether. In these cases, participants reported that they refer to their health professionals' advice for additional information. Thus in addition to the Ministry of Health Malaysia, health professionals were another main sources of information about weaning practices and they were considered to be more reliable and trustworthy than sources used such as friends and family, books or the internet. This result is in line with other weaning studies conducted elsewhere that have indicated that health professionals were the most common source of advice on weaning (Anderson *et al.*, 2001; Lappalainen *et al.*, 1998; Adair *et al.*, 1993). This result is also in agreement with findings by Synnott *et al.* (2007) which showed that the majority of parents do not necessarily adhere to infant feeding guidelines and advice from family or relatives on infant feeding practices. Also similar to extant studies (e.g. those by Schwartz *et al.*, 2013), a few of the parents stated that "every baby is different" or that the "mother knows best" and as such, the formal advice could be limited in relation to individual differences between babies. Overall, though, this was a minority attitude with more than half of the parents strongly disagreeing that they can follow their intuition and feelings on infant feeding practices. This study also found that parents feel

that there is not enough information regarding functional weaning foods provided by the Ministry of Health Malaysia. These results support previous studies where due to the limited consumers' knowledge and awareness of the health effects of functional foods, there is a strong need for specific information and communication activities to consumers in this respect (Biacs, 2007; Salminen, 2007; Wansink *et al.*, 2005). This is in line with the results from Annunziata and Vecchio (2011) that showed manufacturers of functional foods should provide more detailed information about their products through information campaigns and public education activities, improve the nutritional claims on labels and also introduce a logo or symbol that might draw attention to the health benefits of the food product.

#### *Homemade or commercial*

The decision whether to provide solely homemade weaning foods or commercial weaning foods or use a combination of both to feed their children during early years' feeding appeared to be a complex decision-making process for parents. Parents must address multiple competing factors when considering what foods to provide their children, such as the cost, nutritional adequacy and food variety, in addition to the perceived convenience of these options (Carstairs *et al.*, 2016). In the current study, half of the parents (most loadings onto factor I and factor III) reported that they preferred to give their babies weaning foods every day that was prepared at home. The main reason given was that they were solely responsible for the ingredients used in the making of weaning food so parents could control the amount of additional ingredients like sugar and salt, seasonings and flavourings. Other reasons for choosing to prepare weaning food at home every day were so that parents could ensure that fresh ingredients were used and that the food was tasty, nutritious and healthy. Some parents (mainly in factor I) stated that it was simple, easy and quick to make weaning foods as it did not require a complicated cooking process. Some of them prepared weaning foods separately from a family meal while others prepared them at the same time in the beginning but separately when adding any sugar, salt, seasonings and flavourings. While similar findings have also been noted by Synnott *et al.* (2007) and Schwartz *et al.* (2013), there was a specific cultural element to the attitudes held by the Malaysian parents in this regards as is illustrated by the following quote "even though the mother is working or busy, a mother should prepare and make weaning food for their children. This is because when the baby eats mother's home cooked food, the blessing is distinct". One related finding was that some of the parents would report buying organic fresh ingredients to cook for their babies and this finding matched those observed in the earlier study by Schwartz *et al.* (2013). Parents reported spending more effort trying to find the best natural ingredients for their babies than they did for themselves.

Parents in factor I claimed that they preferred making homemade weaning foods and that the commercial weaning foods were a good substitute option only when they were too busy (e.g. during an emergency, as a snack, or away from home). Yet, even in these instances, they may still try their very best to make weaning food by themselves even when they are travelling away from home by preparing it in advance or bringing a small rice cooker along. This result is supported by Schwartz *et al.* (2013), where the mothers claimed that the ready-to-eat baby foods were good for backup option only. Commercial weaning foods were mostly accepted by parents in factor III and especially in factor II. Parents in factor III chose to purchase commercial weaning foods to provide a varied diet for their children. Although these parents made homemade weaning foods and considered homemade weaning foods to be a big part of their babies' daily diet, they also gave commercial weaning foods as they wanted babies to have a balance and variety of weaning foods. Food variety is an important characteristic of the weaning period also noted by Lange *et al.* (2013). However, like parents in factor I, parents in

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factor III also believed that homemade weaning foods were healthier than commercial weaning foods. In contrast with parents in factor I and factor III, parents in factor II preferred to give commercial weaning foods as part of their child's daily diet as commercial weaning foods were a convenient option and ensured that a maximum variety of ingredients were available in their child's diet. Interestingly, a higher number of fathers load onto this factor. They believed that preparing homemade weaning foods were more difficult and time-consuming than buying commercial food. These parents are more adventurous in trying different types of commercial weaning foods available in the market. Parents in factor II believed that not all commercial weaning foods had high sugar and salt content and contained preservatives and additives. In agreement with Schwartz *et al.* (2013), they trusted food labels and trusted manufacturers to provide appropriate seasoning and adequate nutrients with the high safety standard. These results also further supported the study by Seaman *et al.* (1996) where one group considered that commercially produced baby foods were specifically manufactured for babies and must, therefore, provided them with the best source of nutrients. Nonetheless, parents in factor I and factor III disagreed and this also supported by Seaman *et al.* (1996) where another group had a high level of concern on the sugar and salt content and nutrition provided by commercial weaning foods.

#### *Factors influencing choice of product*

Surprisingly, all parents in this study agreed that ingredients in the product, ease of digestion and the quality of the product were the primary criteria when purchasing commercial weaning foods. This may be due to the fact that parents could not take any risk in terms of the child's health. This finding is contrary to a previous study (Synnott *et al.*, 2007) which found taste, organic ingredients, brand and method of production as being the most important determinants. However, some parents did consider other factors such as brand and price of the product and also baby's reaction (like/dislike) towards the product. These findings were similar to an earlier study in Malaysia, where parents were found to have a high level of brand loyalty on infant and follow-up formulas and willing to pay what they perceived to be a reasonable price for quality goods. This is because they prefer a brand that they are familiar with and which is available in the market. It is interesting to note that some of the parents referred to a health professional before purchasing any products and then would only purchase the products recommended by them. This indicates the importance of this information source in influencing purchase decisions.

#### *Infant diet and health awareness*

As expected, all parents wanted their children to have a healthy diet with most stating that it was more important for a baby to have a healthy diet than for their parents to have one. The reason given was that the baby needed to have essential nutrients to grow healthy and the parents were responsible for providing them. Nonetheless, some of the parents thought that both parents and children should have a healthy diet as parents should be a good example to their children in with the hope that eventually the children would follow them to eat healthily as they grew up. But, due to a reported lack of time and energy, it is difficult for parents to eat healthily or provide a healthy meal and that why sometimes, convenience takes over from a healthier option. The result seems to be consistent with Synnott *et al.* (2007) who stated that the majority of parents believed that healthy eating was negatively influenced by irregular working hours and acknowledged that a hectic lifestyle imposed time limitations on preparing a healthy meal.

*Functional foods*

Interestingly, Malaysian parents do purchase and consume functional foods despite not knowing the term “functional food”. Based on the previous study by Lau *et al.*, consumers can be unaware they are purchasing functional foods if functional foods are not labelled as such. While most of the participants were unaware of the term, they were aware of the health benefits provided in functional food products. The Malaysian parents reported that functional food products were conventional food products with added benefits and did not perceive them as one homogenous group. Consumers are increasingly choosing more functional packaged food such as products containing vitamins and minerals due to affordability and their widespread availability (Euromonitor International, 2017). Most of the parents disagreed that consuming functional food products was part of the ethnic culture. This finding is contrary to the previous study of Hassan (2011) which suggested that participants negotiated their cultural characteristics such as religion, ethnicity and food beliefs subconsciously every time they made a decision to consume or not consume a selected functional food. This contrary finding maybe resulted due to globalisation, social and lifestyle changes in Malaysia, which has resulted in products being available and easily accessible (in certain areas only), or alternatively, they may be unaware of their ethnic culture influencing their consumption of functional food products.

One-third of the parents, especially parents in factor I, believed that functional food products were not real genuine foods. One reason for this result might be that functional foods were processed foods and some studies have shown consumers to perceive those as somewhat unnatural (Jonas and Beckmann, 1998; Poulsen, 1999; Bäckström *et al.*, 2003). Earlier studies (Urala and Lähteenmäki, 2004, 2006; Annunziata and Vecchio, 2011) found concerns consumer confidence in functional foods describes as whether individuals feel these products are safe and to what extent they believe in the scientific basis underlying the information about the health effects of functional food. However, most of the parents in the current study did confidently believe that functional foods were safe to eat and it was not difficult to differentiate between functional foods and non-functional foods. Nevertheless, the parents had slightly negative attitudes towards functional foods being healthier than conventional products as some of them did not trust the promised benefits and had mixed attitudes on whether functional foods can provide health benefits beyond basic nutrients. In the current study, parents felt neutral towards a functional food product taste, appearance, and quality and slightly disagreed that they are worth a premium price. It seems possible that these results are due to the fact that functional food products are considered similar to the conventional alternatives available in the market and also due to the belief that conventional products are as good as functional foods. This is probably because as consumers, they expect good information such as health benefits and nutrition facts about the functionality of a product and this information will be the basis for functional benefits assessment (Annunziata and Vecchio, 2011). One of the most important aspects for functional food manufacturers to communicate is the health effects to the final consumer (Nicolay, 2003; Poulsen, 1999).

Nonetheless, when the parents were asked about functional food products for infants, parents in each factor had different attitudes towards the products. Some of the parents recently realised that the food products that they bought for their infants were considered functional foods. The results of this study indicated that both parents in factor II and III believed that functional weaning foods are necessary for babies since they trust that these products can support physical growth and mental development and make a balanced diet easy for babies. In contrast, parents in factor I disagreed as they believed that homemade weaning foods were better than functional weaning foods and it was not smart to purchase functional weaning foods. It seems that parents who have trust in the food

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industry seem to be more likely to buy them compared with parents who do not trust the food industry (Siegrist *et al.*, 2008). The findings of the current study show that both parents in factor I and III still prefer natural weaning foods compared to the other food products. While most parents agreed that functional weaning foods were not necessarily needed regularly (only when the baby is sick or lacking nutrition) they did agree that they could be given at any time to babies.

### Conclusion

There is no perfect method for measuring attitudes accurately. However, Q-methodology purpose is to reveal subjective structures, attitudes and perspectives from the standpoint of the person or persons being observed (Brown, 1996). Q-methodology was effective for this study in exploring parents' attitudes influencing weaning and weaning foods. While Q-methodology method has previously been used by other food scholars, there are, however, some known limitations in using this method. For example, Q-methodology cannot be used to estimate population statistics or to make claims about the percentage of people expressing them (Kitzinger, 1987). It can, however, sample the range and diversity of views expressed, and hence this study was conducted at different geographical locations in order to capture as many as possible different views and attitudes of Malaysian parents. Therefore, claims about ethnic differences and cultural influences in parental attitudes presented in this study are considered to be tentative and exploratory and the degree to which these views and attitudes are prevalent in the wider Malaysian population is unknown. This research has provided a foundation on which to build further research on weaning and functional weaning foods. Q-methodology explores the diversity of views rather than the prevalence of view, where participants are selected purposely (Ahmed *et al.*, 2012). In order to generalise the study data, further research is needed and might include, for example, a large population survey that could be used to produce more quantifiable segments. This would allow for a better consumer profiling based on who ascribes to the viewpoints and would then make it possible to make generalisations across a larger population. Future research also can explore the impact of different locations on Q-methodology results.

It would also be beneficial to examine further the ways in which government bodies, social policy, health practitioners, and the food industry could disseminate information on infant diet and feeding practice during weaning. Based from the discussion, there is a lack of awareness on the infant feeding guidelines among the parents, and yet seemingly strong trust for messages from the Ministry of Health. This might point to a need to strengthen communication of guidelines to parents. The food industry also can explore further to establish how they can build trust in commercial and functional foods as there is also a lack of trust of commercial foods among some parents. By understanding the idiosyncrasies of the three different attitudes towards weaning practices and weaning foods, product developers, marketers and health communicators can now work more effectively in the design of their products and their marketing mix to ensure that these resonate well with the parents who want to provide the best weaning foods possible for their children.

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