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Attachment 1 – Consumer research on infant formula labelling

Supporting document 3

Provision of Information

Proposal P1028 – Infant formula

This is a targeted review of consumer research related to the labelling of infant formula products relevant to the provision of information. This review informs the 1st Call for Submissions Report for Proposal P1028 – Infant Formula.

The consumer evidence reported on in this review is not restricted to peer-reviewed published research. Given there is an evidence gap in recent published research examining Australian and New Zealand caregivers' use and understanding of infant formula, this review incorporates primary research commissioned by FSANZ to address this information gap and inform P1028. Furthermore, grey literature also addressing the subject matter has been included.

This review addresses a series of research questions related to: nutrition information statements, ingredient lists, proxy advertising, nutrition and ingredient content claims, stage labelling, formulas for special dietary purposes, and off-label information sources. The research reviewed here used a range of research techniques (e.g. qualitative focus group and quantitative cross sectional survey design) and offers insight into the nature of labelling of infant formula where findings align.

The review finds caregivers use the nutrition information statement (NIS) and ingredient list for a variety of reasons. Caregivers want to identify the differences between infant formula products including which nutrients are present and the levels of these nutrients. However, caregivers struggle to use the current NIS format to make these comparisons. Standardising the order in which the nutrients are listed in the NIS and incorporating headings for vitamins, minerals and addition or non-essential nutrients can help caregivers compare formula products.

In relation to consumers' interactions with nutrition and ingredient content claims, views are mixed. Some consumers report considering claims on infant formula as a marketing strategy. They often do not understand what the specific nutritive substance or ingredient in the claim does. Consumers find that if the benefit of a substance or ingredient is stated then it is easier to understand the purpose of a substance or ingredient. Further, claims are appealing when they draw comparisons to benefits associated with breastfeeding or breastmilk composition. This is reportedly due to such claims alleviating concerns associated with deviating from medical advice that breastfeeding is the recommended approach to infant feeding. The

literature review found nutrition content claims, ingredient claims and health claims can influence caregivers' perceptions of infant formula products.

Caregivers consider age information on infant formula, follow-on formula and toddler milk labels important. They believe these products are designed for the nutritional needs for specific ages of infant or child; they try to give their infant or toddler a product appropriate for their age. However, the findings suggest a small proportion of Australian caregivers (and potentially New Zealand caregivers) are introducing follow-on formula to infants before six months of age. Further research is needed to determine the prevalence and reasons for this behaviour. The literature review did not find any research in which caregivers' understanding of stage identification label elements was actually tested. The research suggests some caregivers' understanding of terms like 'infant formula', 'follow-on formula' and 'toddler milk' differ from how they are used by government agencies and researchers. The findings support clearly displaying age information to assist caregivers to select appropriate products for their infant.

Many caregivers seek off-label advice about infant formula. In particular, caregivers report seeking and valuing advice from healthcare professionals. Key pieces of information users of infant formula wish to know that they cannot obtain from on-product labels are: what key nutrients they should look for, knowledge regarding standardisation of all infant formula products, knowledge of nutrients associated with infant reflux and constipation, as well as which products most closely resemble breastmilk.

While caregivers who use infant formula seek and value information they receive from healthcare professionals, on occasion they report difficulties obtaining information from these sources. Findings indicate that caregiver decisions to commence using infant formula were informed primarily by informal information sources. Professional advice concerning the use of infant formula was generally provided by healthcare providers after infant formula feeding had begun.

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Introduction

Objectives

This review informs FSANZ's approach toward the provision of information on infant formula as part of the P1028 1st Call for Submissions. The objectives are to review evidence on consumer use and understanding of infant formula labelling, and to investigate information sources consumers use to inform their decisions toward infant formula.

Background

This review builds on the previous rapid assessment of consumer research prepared by FSANZ as part of initial consultations to date as part of P1028 (refer to SD2 Attachment A2.2 – Rapid evidence assessment on infant formula preparation, perceptions and label use pp. 85).

In 2016, FSANZ noted there was limited published literature which investigated infant feeding practices and specifically use of infant formula. This led FSANZ to commission several pieces of research to examine consumer perceptions and understanding of nutrition labelling on infant formula products.

Method

This paper reviews FSANZ-commissioned research, peer-reviewed literature, and grey literature. Peer reviewed research was identified by searching six online research databases for studies published between 2003 and September 2019. More detail on the literature search and review methods are provided in Appendix A.

Scope

This review is structured around the following research questions:

1. Does the format of the nutrition information statement and ingredient list enable caregivers to make informed choices? If not, what changes would enable them to make informed choices?
2. Does the proxy advertising of later stage formulas (12 months +) on infant or follow-on formula influence perceptions and purchase intentions toward infant formula?
3. How do caregivers perceive and understand nutrient content claims and ingredient claims on infant and follow-on formula?
4. How aware and understanding are caregivers of stage identification label elements on infant formula products, including follow-on formula?
5. How do caregivers perceive and decide to use infant formulas designed for special dietary purposes?
6. Are sources of information beyond 'on tin labelling' helpful in guiding caregiver choices and understanding of infant formula?

For each question a summary of evidence from FSANZ-commissioned research is provided, followed by a summary of additional literature, and then conclusions.

Findings

1. Format of the nutrition information statement and ingredient list

This section addresses the research question - “Does the format of the nutrition information statement and ingredient list enable caregivers to make informed choices? If not, what changes would enable them to make informed choices?”.

1.1 FSANZ-commissioned research

As part of P1028 FSANZ commissioned a series of studies to investigate consumer perceptions, understanding and use of nutrition labelling on infant formula products. This work ensures potential amendments to the Standard 2.9.1 are well informed.

A study commissioned by FSANZ (Malek, Fowler, Duffy, & Katzer, 2019) explored caregivers’ views and understanding of the NIS and ingredient list on infant formula. The study was conducted in 2016 and consisted of 136 Australian and New Zealand caregivers spread across 21 focus groups[1] who care for an infant aged up to 12 months. Participants in the focus groups were exposed to a range of commercial infant formula products. Products were chosen to expose participants to claims on infant formula[2], as well as ‘premium’ or ‘standard’ range products.

Caregivers reported using the NIS in a range of ways. These can be grouped into two categories: using the NIS to identify which nutrients are present and which are absent, and using the NIS to examine nutrient levels. Caregivers raised several limitations that affected their ability to use the information.

Some caregivers mentioned using the NIS to examine which nutrients were present or absent in a product. For example, caregivers reported using the NIS to compare the content of premium formulas against standard formulas. In particular, they wanted to determine whether there were additional nutrients in the premium formulas that were absent in standard formulas. They often performed this comparison to determine whether the higher cost of a premium formula was worth it. Some caregivers who had made these comparisons observed premium and standard infant formulas often display the same nutrients in the NIS. They concluded the differences between premium and standard infant formulas were minimal.

Other caregivers felt information on the presence or absence of different nutrients was not helpful. They explained they did not know what the different nutrients were or what benefit they had. So this information did not tell them which infant formula was better or more appropriate for their infant.

Some caregivers reported preferring products with longer lists of nutrients in the NIS. They believed products with longer lists were more nutritionally comprehensive. This suggests some caregivers are not confident that all infant formula products are nutritionally complete. A long NIS reassures them that all the necessary nutrients are there. However, three caregivers reported the length of the NIS made it challenging to compare products. They believed the NIS should be simplified.

The NIS was generally more useful for caregivers with an infant that had specific nutrition or health requirements. For example, caregivers mentioned using the NIS to find an infant

[1] 12 focus groups in Australia (seven in metro areas and five in regional areas). Nine focus groups in New Zealand (six in metro areas and three in regional areas). One group had two participants, all others ranged from five to nine participants.
[2] At the time the study was conducted some infant formula products carried claims on their labels.

formula that would help their infant gain weight, address a micronutrient deficiency, or manage a gut issue.

Generally, caregivers did not find the nutrients levels (e.g. 0.76g iron) listed in the NIS helpful. Caregivers did not know whether differences in values for particular nutrients across products were meaningful (for example, whether the higher level of iron in one product made it better than another). Caregivers said that a lack of information such as reference values (e.g. daily value percentages) for nutrients reduced their ability to meaningfully compare products.

Some caregivers used the NIS to compare nutrient levels between premium and standard infant formula products. They reported this comparison was generally easy, especially when the NIS listed the nutrients in the same order.

Caregivers also reported checking the levels of sugar, salt and fat in the NIS. They explained they did this because these are the nutrients they check on food they are buying for themselves. However, some caregivers explained they found this difficult because different names were used to declare sugar. This finding suggests the use of the NIS is partly determined by caregivers' understanding and knowledge of the dietary requirements of their infant.

Similar to the NIS, caregivers indicated having a lack of knowledge and understanding of the contents of the ingredient list. Caregivers' views of the ingredient list varied. A few noted longer ingredients lists were problematic for them as they did not know what many of the ingredients were. Some caregivers described long lists as 'scary' or 'off-putting'. In comparison, a few caregivers viewed longer ingredient lists as better because they believed a longer list indicated a product is nutritionally comprehensive. This echoes findings for the NIS, that some caregivers are not confident that infant formula products are nutritionally complete.

Many caregivers reported that they often don't read the ingredient list, and expressed a variety of reasons for this. A common reason was that they did not understand the ingredients. Other caregivers believed the manufacturer would produce formula that was safe and that complied with government standards and so reading the ingredient list was not necessary. A few caregivers said they avoided reading the ingredient list as they preferred not to know what was in the product.

Most caregivers indicated they would use the ingredient list when choosing between products if they had a reason to do so. The main reason caregivers cited for looking at the ingredient list was to avoid specific ingredients for health reasons (e.g. if their infant had an allergy or intolerance). Only two caregivers said they checked the ingredient list for the presence of ingredients they thought were desirable; they mentioned looking for 'omega' and 'fish oil'.

The findings from this study suggest that neither the NIS nor the ingredient list effectively enable consumers to make informed choices when purchasing infant formula. While the NIS is used by caregivers to compare products, many caregivers are unsure what they should be looking for in the NIS. For example, they are unsure what particular nutrients they should look for, and they do not know what levels of nutrients should be present. In some cases they apply rules for general food products (e.g. look for products with a low sugar content) that are not applicable to infant formula products. This appears to be a consequence of poor infant nutrition knowledge.

Caregivers generally report not looking at the ingredient list on account of not understanding what the ingredients are. Of those who report attending to the ingredient list, they do so on

the grounds they look for specific ingredients associated with pre-existing health concerns on behalf of their infant.

Some caregivers were not confident that all infant formula products would provide complete nutrition for their infant. These caregivers looked at the length of the NIS or ingredient list for reassurance that the product was nutritionally complete.

An online survey commissioned by FSANZ (Malek, 2017) examined caregivers' use and preferences for information on infant formula products. Participants were 285 Australian and 341 New Zealand caregivers (626 total) of infants aged up to 18 months. Participants were primary (or shared responsibility) decision makers concerning the consumption of infant formula. Participants in the survey were required to have an infant who received either infant formula or follow-on formula when aged between birth and 12 months of age.

Respondents indicated that the ability to identify differences between infant formula products in general is useful[3]. However, only half of the respondents reported being confident in their ability to identify differences between products[4], or considered identifying differences between products was easy[5]. The responses to these questions were not in relation to any specific label element, but rather infant formula products as a whole.

In the survey, respondents were presented with a NIS and an ingredient list and asked if they found either label element helpful when deciding which formula product to buy. Nearly two thirds (67% of Australians and 63% of New Zealanders) indicated the NIS is helpful, and less than half reported the ingredient list as helpful (44% of Australian and 42% of New Zealand respondents).

Respondents tended to use the NIS to identify products with higher levels of nutrients. Of the respondents (n=406) who reported the NIS is helpful when making purchase decisions, most (68% of Australian and 70% of New Zealand respondents) indicated they were looking for higher levels of most nutrients. Around a fifth of these respondents (18% of Australian and 17% of New Zealand) also indicated they were looking for specific nutrients to avoid. Of the 406 respondents who reported finding the NIS helpful when making purchase decisions, only 7% of Australian and 5% of New Zealand caregivers reported looking for higher levels of specific ingredients.

Some respondents preferred shorter ingredient lists and others preferred longer lists. For those who reported the ingredient list as helpful (n=269), 35% of Australian and 26% of New Zealand respondents indicated they look for the shortest list. By comparison, 17% of Australian and 27% of New Zealand participants reported looking for the longest list. From a list of specific ingredients respondents could choose from in the survey, the top three ingredients reportedly looked for specifically were sugar, protein and iron.

Survey respondents were asked about their perceptions regarding ease of understanding the NIS and ingredient list. Only a small proportion of respondents (approximately 5%) indicated either the NIS or ingredient list are easy to understand on all products. Close to a quarter indicated the ingredient list is difficult to understand on any or a few formula products. Close to one in five participants indicated the NIS is difficult to understand on any or a few products. For Australian respondents, a third indicated that both the NIS and ingredient list are easy to follow on about half of all formula products. Among New Zealand caregivers,

[3] 88% of Australian and 86% of New Zealand respondents
[4] 55% of Australian and 47% of New Zealand respondents were confident in their ability to differentiate between products.
[5] 51% of Australian and 49% of New Zealand respondents considered identifying differences between products as easy.

28% reported the ingredient list products and 31% reported the NIS is easy to follow on about half of all formula products.

Respondents were asked to indicate how easy they found it to compare products using the NIS and ingredient list. As indicated earlier, in this study respondents generally reported the NIS was more helpful than the ingredient list when comparing products. However, when asked about ease of use to compare products, the NIS was generally perceived as more difficult to use than the ingredient list. Fifty two percent and 47% of Australian and New Zealand respondents respectively reported the NIS was difficult to use when comparing products. In comparison, 34% and 37% of Australian and New Zealand respondents found the ingredient list difficult to use when comparing products. In general, a quarter of all respondents found the NIS easy to use compared to close to 40% of respondents reporting the ingredient list is easy to use when comparing infant formula.

The above findings indicate that while caregivers report the NIS as more helpful in comparing products, the NIS is perceived as more difficult to use than the ingredient list when making comparisons between formula products.

Respondents in the survey were asked to indicate how much they agree specific changes to the NIS and ingredient list would make product comparisons easier. Respondents were shown pictures that illustrated how each change would look. The following tables outline the levels of agreement against the proposed label changes presented in the survey.

Table 1. Proportion of caregivers who agree/disagree that specific changes to the **ingredient list** on infant formula products would make product comparison easier

	Australia (n=285)			**New Zealand (n=341)**		
	Agree (%)	**Neither agree nor disagree (%)**	**Disagree (%)**	**Agree (%)**	**Neither agree nor disagree (%)**	**Disagree (%)**
Highlighting any optional ingredients, which are not found in all products	59	29	13	65	22	13
Grouping types of ingredients (i.e. vitamins, minerals)	75	19	6	77	17	6
Grouping optional ingredients	53	32	15	55	30	15
Using the same colour scheme on all products/labels	51	34	15	51	32	16
Same location on all products/labels (e.g. always under the nutrition information)	72	23	5	72	23	5
Same size text on all products/labels	67	26	7	62	27	11

Table 2. Proportion who caregivers who agree/disagree that specific changes to the **NIS** on infant formula products would make product comparison easier

	Australia (n=285)			New Zealand (n=341)		
	Agree (%)	Neither agree nor disagree (%)	Disagree (%)	Agree (%)	Neither agree nor disagree (%)	Disagree (%)
Listing nutrients in the same order on all products	76	18	6	77	17	6
Highlighting any optional nutrients, which are not found in all products	72	20	8	71	20	9
Grouping types of nutrients (i.e. vitamins, minerals)	80	15	5	83	14	4
Grouping optional nutrients, which are not found in all products	71	19	10	72	21	8
Using a different colour for every other row	68	23	9	66	24	10
Using the same colour scheme on all products/labels	38	33	30	38	34	28

Respondents agreed that most of the proposed label changes would assist caregivers in making product comparisons. There were no significant differences between Australian and New Zealand caregivers' responses. In relation to the ingredient list, respondents strongly agreed that grouping types of ingredients as well having the list in the same location across products was preferable. In relation to the NIS, there was strong agreement that all of the proposed label options would be valuable with the exception of using the same colour scheme across all formula products. The survey did not explore why caregivers agreed or disagreed with the presented label formats.

Further focus group research was conducted to investigate consumer use and preferences toward the presentation of the NIS on infant and follow-on formula products (Malek, 2018a). Participants were 92 caregivers from Australia and New Zealand across a total of 14 focus groups. The research was undertaken in April-May 2018 and was informed by the online survey reported above.

One aim of the study was to elicit from caregivers whether specific changes to the NIS would assist them to read the nutrition label and compare products. Four different examples of NIS labels were presented to caregivers within the focus groups. The four examples were:

1. Listing nutrients in the same order on all products
2. Grouping 'optional' nutrient/ingredients with the subheading 'optionals'
3. Grouping types of nutrients with the subheadings: 'vitamins', 'minerals', 'optionals'
4. Grouping some optional nutrients/ingredients under relevant nutrient headings[6]

[6] For example, on label four an optional like galacto-oligosaccharides would be listed under 'Carbohydrate' because they are a type of carbohydrate. This is in contrast to label three where galacto-oligosaccarhides would be listed under 'optionals'. For label four, the only optional nutrients listed under the 'other nutrients' heading were those that were not a subset of another nutrient type listed in the NIS.

Two versions of each of the four examples were presented to the focus groups. The two versions of each label varied in brand name, values in the NIS, and background colour (shading alternate rows within the NIS or presenting a plain background).

Caregivers believed the first label example (prescribing the order) would make comparisons between products easier compared to the labels of products currently on the market. However, compared to the other three label examples caregivers found it harder to use. Without grouping categories of nutrients and substances, caregivers found the NIS difficult to understand. This is likely to be a consequence of general nutrition knowledge amongst caregivers being poor.

Of the three examples where nutrients and substances were grouped, example three was the most preferred format by the majority of focus groups. Caregivers reported they found it easier to understand as the format split nutrients into distinctive groups (vitamins, minerals, and optionals). Mock label four was the second most preferred label format with many reporting it to be as useful as label three. Some caregivers indicated they found listing nutrients under their relevant macronutrient heading (e.g. DHA under 'omega 3' which is under 'fat) useful as it helped them to make sense of what type of nutrients they are. However, other caregivers felt that further detail about optional/other nutrients within broader nutrient groups may be "unnecessary" and potentially "confusing" because they considered the label layout to be "messy", "too detailed" and "cluttered", with some caregivers suggesting that this formatting could make product comparison harder. The format of label four was considered most useful to those whose infant/s had special dietary needs, with some caregivers of infants who had specific nutritional requirements reporting that they would find the additional information useful, providing the label format made it more noticeable.

Caregivers reported confusion around the term 'optionals' when used as a category in the NIS. Each focus group had at least one participant that understood the intended meaning of the term (that it was optional for manufacturers to add these nutrients). However, the term suggested different meanings to different participants. Some believed it meant it was optional for the caregiver whether the optional nutrients were added to the infant formula. For example, they suggested the optional nutrients might be included in a separate sachet they could mix in themselves. Others thought it meant there was another version of the product that contained these nutrients. They were unsure whether or not optional nutrients were necessary for all infants, or whether they might be necessary for infants with particular health conditions. Overall, most participants found the term 'optionals' confusing.

While the term 'optional' was confusing, the heading was considered eye-catching nonetheless. Caregivers reported when the 'optionals' group was highlighted in the NIS it drew their attention toward those nutrients. Overall, caregivers reported the 'optionals' category would be more helpful if a clearer and less vague term was used. Some caregivers reported having a preference for label four because it used the term 'other nutrients' rather than 'optionals'.

Caregivers that understood the intended meaning of 'optionals' believed they would use it in two different ways. The first was to ignore nutrients listed under the heading on the basis they were non-essential and therefore unimportant. They could then focus their attention on the essential nutrients when comparing products.

The second approach was to focus solely on the optional nutrients when comparing products. The rationale for this was they assumed the remaining nutrients (that were not optional) would be the same across products and could therefore be ignored.

Of the examples shown to caregivers, there was a general preference toward the examples with shaded alternate rows within the NIS. Caregivers found that this made comparisons between products easier and assisted identification of nutrients and contained quantities within products.

As a follow up to the above focus group study, an online survey was conducted (Malek, 2018b). The survey aimed to test whether changes to the NIS on infant formula products would assist consumers in making better informed decisions when comparing formula products. The survey consisted of 906 caregivers (493 in Australia and 413 in New Zealand). Respondents were caregivers of children up to 24 months of age who had received infant or follow-on formula between birth and 12 months. Fifty-three Australian and 58 New Zealand respondents were from non-English speaking backgrounds.

Respondents were asked if they had previously used the NIS when deciding to use infant formula. Sixty-nine percent of the respondents indicated they had and were subsequently asked if they found the NIS helpful. Of those respondents, the majority (87%) indicated the NIS had assisted them in making purchase decisions in the past. Seventy percent of the respondents reported that the ability to compare formula products was important. Despite this only half of the respondents declared that comparing products using the NIS is an easy task.

The survey tested caregivers' interpretation of a range of headings for the nutrients which were voluntarily added by the manufacturer. Caregivers understood headings 'additional' and 'non-essential' to mean nutrients under those banners are not required to be included by the manufacturer. In other words, these terms accurately conveyed to caregivers the intended meaning. In contrast, terms such as 'others' and 'optionals' were found to be least understood by caregivers.

In order to test the usability of NIS label formats, respondents were presented with four mock up NIS labels in the survey. These were:

1. Status quo (no headings and nutrients listed in different orders on different products)
2. Listing nutrients in the same order on all products
3. Grouping types of nutrients with subheadings: 'vitamins', 'minerals', 'others'[7]
4. Grouping types of nutrients with subheadings: 'vitamins', 'minerals', 'others', but with some optional nutrients/substances listed under relevant macronutrients (e.g. listing DHA under 'fat').

Respondents were presented with 12 choice tasks. They were presented with two versions of a NIS format (varying in some values contained in the NIS as well as differences in background colour) and were asked to select the product containing a higher amount of a particular nutrient. Three choice tasks were completed for each label format and average response times were calculated as a measure of ease of use for each format.

The analysis of response times revealed that labels two, three and four all assisted caregivers to make quicker comparisons than current status quo nutrition statements (label one). These differences were statistically significant. Of the three format changes tested, listing nutrients in the same order (label two) assisted caregivers to make the quickest comparisons compared to formats where nutrients were grouped (labels three and four). There was no statistically significant difference in response times between label three and label four.

No label was tested that listed nutrients in the same order as well as grouping nutrients with

[7] Unlike in label one, the nutrients in labels two and three were not listed in the same order.

headings. So it is unknown whether combining these improvements to the format of the NIS would result in even quicker comparisons than listing nutrients in the same order only.

1.2 Additional literature search findings

A qualitative Australian study used interviews with 24 caregivers of infants aged between 9 and 11 months to investigate caregivers' use of infant formula (Appleton et al., 2018). Respondents were initially recruited online and asked to complete a series of online surveys before receiving a semi structured telephone interview. All respondents had used infant formula or follow-on formula with their infant in the first nine months. Caregivers during the interview were asked specifically about what 'on tin' labelling influenced their choice of formula.

Some parents indicated they considered the list of ingredients and nutrition panel (nutrition information statement) as a factor in their choice of formula. However, other parents expressed confusion in understanding these label elements. They wondered whether they could be trusted and felt they needed help understanding them.

The New Zealand Ministry for Primary Industries commissioned a study (Yockney & Comfort, 2013) seeking to examine consumer understanding, perceptions and uses of follow-on formulas (6 to 12 months) and toddler milks (12 up to 36 months). For some topics, perceptions of infant formula were also captured. The qualitative research was conducted using online forums with a total of 137 caregivers in Australia and New Zealand. Three forums were created consisting of: formula users in Australia, formula users in New Zealand, and non-users of formula in both Australia and New Zealand. Caregivers in the study had at least one child aged between six and 36 months.

Analysis of the online forum entries in relation to the topic of the ingredient list found that many caregivers find the information useful. This is primarily because caregivers wanted to know the composition of a formula product so they could:

- Know what and how much of each ingredient their child is consuming
- Avoid any ingredients to which the child may be allergic
- Avoid any ingredients that they do not want their child to consume too much of (e.g. a few Australian users are concerned about sugar consumption and a few New Zealand users are concerned about artificial flavours and colours)
- Compare products to find the best composition for their child

Those caregivers who found the ingredients information less useful (more commonly the New Zealand users) did so because they:

- Believe most formula products and toddler milks are made with the same ingredients
- Do not know what most of the ingredients are
- Are not sure what is meant to be in the ingredients, so the list seems meaningless to them
- Trust the brand they purchase, and therefore the ingredients that are used
- Do not have children who experience allergies or food intolerances

An online survey commissioned by the Infant Nutrition Council (Jigsaw, 2015) also investigated caregiver use of nutrition information on labels. The survey consisted of 501 mothers with an infant aged between 0 and 24 months who had been fed infant formula between the ages of 0 and 12 months. Respondents were asked what type of information they seek when looking at formula products in general. A third of respondents reported looking for ingredients when looking at formula products. This was second to 'brand' which

half of the respondents reported looking for.

When asked about making a decision on a particular brand of formula, 36% of respondents reported seeking information about the best formula based on nutritional needs. A third of respondents reported seeking information regarding ingredients and nutritional benefits. When asked specifically what on pack information they sought when making a purchase decision, 24% reported looking for information related to nutritional/health benefits and 20% reported looking at the ingredients.

The online survey findings suggest that the nutritional properties of formula products are important to consumers and listed ingredients on label are sought by a reasonable proportion of caregivers.

1.3 Conclusions

Findings from the research in this review indicate that users of infant formula use the NIS and ingredients list for a variety of reasons. Caregivers look to the NIS to identify the presence or absence of particular substances. For example, they use it to identify which, if any, nutrients premium formula products have that are absent in standard formulas. In some cases, they also check the NIS to see whether the nutrient levels are higher or lower in particular products. This can be to identify a product suitable for an infant with a particular nutritional or health issue, or to see whether nutrient levels differ between premium and standard formulas.

Caregivers also look for the presence or absence of particular nutrients in the ingredient list. Similar to the NIS, this is often done because they believe their infant has particular nutritional or health needs. For example, they may need to avoid an ingredient their infant is intolerant to.

For both the NIS and ingredient, some caregivers preferred products with longer lists. They believed products with a longer NIS or ingredient list were more likely to be nutritionally complete. This suggests some caregivers lack confidence in the quality of infant formula on the market and may not be aware that all products need to meet certain standards.

In contrast, some caregivers preferred shorter ingredient lists. They found longer ingredient lists off-putting. Some caregivers reported the large number of nutrients listed in the NIS made it challenging to compare products.

Caregivers considered it was important they were able to use infant formula labels to identify differences between infant formula products. However, many caregivers are not confident they can do this with the current format of the NIS and ingredient list. Barriers to using the NIS and ingredient list include: not understanding what the nutrients and ingredients are (and what their role is), not knowing what levels of nutrients should be present, and the large quantity of information.

For both the ingredient list and NIS, caregivers believe grouping nutrients/ingredients by type (especially vitamins and minerals) would help make product comparison easier. Standardising the location of the ingredient list was also supported by caregivers.

In addition to grouping nutrients, a range of other changes to the NIS format were popular with caregivers. These were: listing nutrients in the same order on all products, highlighting optional ingredients, grouping optional ingredients, and using a different colour for each other row.

Testing revealed that listing nutrients within the NIS in the same order and grouping nutrients

with subheadings (vitamins, minerals, others) resulted in quicker comparisons. Standardising the order of nutrients in the NIS had the greatest effect on response times. The findings suggest that ordering nutrients in the NIS uniformly across infant formula products may assist consumers to compare products. These findings are consistent with previous research on nutrition information panels/nutrition facts panel (TNS Social Research, 2004; Wogalter & Kalsher, 1994). Research commissioned by FSANZ found that Australians and New Zealanders' ability to compare the nutrient content of products was negatively affected by differences in nutrition information panel (NIP) format (TNS Social Research, 2004). Participants were more likely to give correct responses when they were comparing two products with an Australian/New Zealand NIP compared to participants comparing two products with different nutrition panels formats (i.e. one Australian/New Zealand NIP and one UK NIP, or one Australian/New Zealand NIP and one US nutrition facts panel). Similarly, Wogalter and Kalsher (1994) found participants could compare the nutrition information on two food products more quickly when the nutrients were listed in a standardised order.

As noted above, caregivers expressed support for grouping optional nutrients together in the NIS. The research found that the best headings for this group were 'additional' and 'non-essential'. These headings were the most effective at conveying the idea that these nutrients were voluntarily added by the manufacturer.

2. Advertising of later stage formulas (12 months +) on infant or follow-on formula

This section addresses the research question - “Does the proxy advertising of later stage formulas (12 months +) on infant or follow-on formula influence perceptions and purchase intentions toward infant formula”

2.1 FSANZ-commissioned research

No research conducted or commissioned by FSANZ to date has investigated whether proxy advertising of later stage formulas (12 months onward) influences consumer/caregiver perceptions or purchase intentions toward infant or follow-on formula products.

2.2 Additional literature search findings

Australian research by Berry and colleagues has investigated whether people perceive or recall advertisements for toddler milks as advertisements for infant formula. Most manufacturers and importers of infant formula in Australia have entered into a voluntary agreement (the MAIF Agreement[8]) to not advertise infant formula products. Retailers are not part of the agreement, so consumers may see infant formula advertised in supermarket catalogues, for example. The agreement only covers infant formula and follow on formula products, so manufacturers can advertise toddler milks (formulated supplementary foods for young children). The research by Berry and colleagues provides insights on how caregivers may perceive and recall advertising of toddler milk products on infant formula and follow on formula labels.

Berry, Jones, and Iverson (2010)[9] used semi-structured interviews with pregnant women to examine how they understood print advertisements for toddler milk products. Interviewees were 15 women pregnant with their first child who were recruited through antenatal classes. When they first looked at the advertisements, most of interviewees reported they were for ‘formula’, ‘baby formula’ or ‘infant formula’. Eight of the participants indicated the image of the packaging in the advertisement[10] showed the product was formula. The responses to later questions showed that some of the interviewees using the term ‘formula’ understood the product was designed for toddlers. However, other interviewees who initially characterised the products as ‘formula’ expressed surprise when they realised they were designed for toddlers. This tended to occur only once they read aloud the text from the advertisement (at the request of the interviewer). Many of the interviewees mentioned that they would not normally have read enough of the advertisement to realise the product was for toddlers.

The findings of this research suggest some caregivers use the term ‘formula’ to categorise a range of milk-based products designed for infants *and* toddlers (i.e. infant formula, follow on formula and toddler milk). The research also found that some caregivers, prior to participating in the interview, considered ‘formula’ to be only for infants. In some cases these interviewees were unaware that toddler milks existed. From the quotes in the article, it appears that interviewees for whom the concept of toddler milks was new tended to respond by expanding their definition of ‘formula’ to include the products. For example, one interviewee who had earlier identified the product in the advertisement as ‘baby formula’ later noted “Ooh so it’s more for older kids. I didn’t know that this would even, came for older kids. I thought it was just for babies” (Berry et al., 2010, p. 25).

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[8] Marketing in Australia of Infant Formulas: Manufacturers and Importers Agreement 1992 (MAIF Agreement)

[9] The studies reported by Berry, Jones and Iverson (2010, 2011, 2012) are reported in further detail in Berry’s PhD thesis (2010).

[10] All three of the advertisements shown to participants included an image of the packaging.

It's possible that caregivers with one or more children would understand the advertisements differently. The participants in the study were pregnant women who had not previously given birth to a live child. So most of them likely had little experience with infant formula, follow-on formula, and toddler milks. Parents with experience using these products would have greater awareness of the age ranges that are catered to. Consequently, they may find it easier to identify that the products are designed for toddlers rather than infants. Notwithstanding this, it is important that all caregivers (including those with less experience) are able to distinguish between infant formula, follow-on formula, and toddler milk products.

This study therefore suggests there are two different reasons caregivers viewing toddler milk advertisements may perceive these as infant formula advertisements. The first is that some people are unaware of the concept of toddler milk. These people are likely to assume the product fits into a category they are already aware of (formula for babies) unless they read the advertisement carefully. The second is that many people only glance at an advertisement; they don't read all of the text. Even if these people are aware of the concept of toddler milk, formula for babies (infant formula) may come to mind first if this concept is more familiar to them and features of the advertisement (e.g. an image of the packaging) seem consistent with formula.

Berry, Jones, and Iverson (2011) carried out a second study with a similar design, but including health professionals as well as mothers and grandmothers. Semi-structured interviews were carried out with a general practitioner, a community dietitian, mothers/expectant mothers (n=4), grandmothers/expectant grandmothers (n=4) and Child and Family Health nurses (n=7). As with the 2010 study, interviewees shown toddler milk advertisements tended to say they were for 'formula'. Some indicated they understood the product was intended for children over 12 months, but used the term 'formula' to describe the product. It wasn't clear from the reporting of the study whether any of the participants believed the product was designed for infants. The findings suggest that caregivers and health professionals may use the term 'formula' to describe both infant formula and toddler milk products.

A third study by Berry, Jones, and Iverson (2012) investigated whether parents recalled seeing advertisements for infant formula products. Berry and colleagues surveyed 439 expectant parents or parents with one or more children under five years at a parenting exposition in Sydney. The majority (92%) of respondents believed they had seen an advertisement for 'formula'. Those respondents who had seen an advertisement were then shown pictures of five infant formula products and asked which, if any, they had seen advertised. Ninety one percent reported they had seen one or more of the products advertised.

Respondents were asked further questions to ascertain whether they recalled seeing a type of advertisement that would be prohibited under the MAIF Agreement. Of the respondents who had reported seeing an advertisement for 'formula', 93% reported seeing an advertisement that did not originate from a retailer. Two thirds (67%) believed they had seen formula suitable from birth advertised and 45% believed they had seen formula suitable from 4-6 months advertised. Among respondents who had only seen a non-retail advertisement, 67% believed they had seen an advertisement for an infant formula product (i.e. believed they had seen a type of advertisement that was prohibited). The authors note that around the time of the study there were no breaches of the MAIF Agreement. They conclude that these respondents had actually seen advertisements for toddler milks but were incorrectly recalling these as infant formula advertisements. Another possibility is that they had actually seen advertisements for infant formula or follow-on formula from a retailer (not prohibited) but were mistaken about the source.

Respondents in the study also recalled seeing claims for the products advertised. As part of

the survey, they were shown seven advertising messages based on mothers' responses to actual toddler milk advertisements in the 2010 study. Over 90% reported seeing one or more of the seven messages advertised. The most common message they reported seeing was about omega 3, iron or probiotics in the formula. Other claims they reported seeing were that the product: ensures proper growth and development (53%), improves babies' brain development (33%), could make babies happy/healthy (31%), was like breastmilk (27%), or strengthens immunity (25%).

As the study relied on respondents' recall of the advertisements they had seen, it is possible that some of these respondents had encountered these claims elsewhere (e.g. friends or family may have made these comments about particular brands of formula or toddler milks) but conflated them with advertisements. However, as the authors note, these types of claims were common in toddler milk advertising at the time of the survey. They concluded that respondents had seen advertisements for toddler milk containing these (or similar) claims and recalled these as infant formula advertisements. This could occur in one of two ways. The first is that respondents exposed to toddler milk advertisements believed they were for infant formula when they saw them. The second is that respondents understood when they saw the advertisements that they were for toddler milk, but then misremembered then as infant formula advertisements.

2.3 Conclusions

The studies by Berry and colleagues suggest that some caregivers who see advertisements for toddler milks believe they are seeing or have seen advertisements for infant formula. This is more likely to occur where they glance at an advertisement and do not read it carefully.

The third Berry et al. (2012) study also suggests that caregivers may remember the brands and claims featured in toddler milk advertisements and attribute them to infant formula products. Based on the earlier Berry et al. studies (2010; 2011) this could be the result of caregivers seeing toddler milk advertising and interpreting them at the time as infant formula advertisements. Another possibility is that some of the caregivers understood they were toddler milk advertisements when they saw them, but recalled them as infant formula advertisements later. This could occur, for example, if infant formula is considered a more typical example of the category 'formula' and so comes to mind more easily. Research suggests that members of a category that are considered more typical can be recalled more easily (Nedungadi & Hutchinson, 1985).

Caregivers who can recall the claims they saw in a toddler milk advertisement may then associate these with infant formula. They may recall seeing these claims associated with an infant formula product, but be unable to recall the brand for formula. No research was found which tested whether caregivers accurately recall which claims were for which brand. I.e., if people see an advertisement for toddler milk Brand X carrying claims, do they believe they saw an advertisement for infant formula Brand X with the same claims? However, more general marketing research shows consumers often do correctly recall which claims are made for which brands (Keller, Heckler, & Houston, 1998).

No research was found which examined caregiver perceptions of toddler milk advertisements on infant formula product packaging. Often these advertisements are for multiple products in the range. For example, an infant formula (stage 1) product might carry advertising for a follow-on formula (stage 2) product and a toddler milk (stage 3) product from the same brand. This context may make it easier for caregivers to realise the age that each product is designed for. So potentially the issue identified by Berry et al. (2010) of caregivers believing they are seeing an advertisement for infant formula may be reduced or avoided. However, this would depend on the amount of attention caregivers are paying to the packaging. If the caregiver only quickly glances at the advertisements on the packaging, it's possible they may

assume they are for the infant formula they appear on.

Alternatively, caregivers may understand when they are reading the infant formula package that the product advertised is a toddler milk but then later conflate the content with an infant formula or follow-on formula product. Research shows it is common for consumers to conflate information from advertisements for different brands within the same product category (Burke & Srull, 1988). They can also conflate information from advertisements for different products from the same brand in the same product category (Burke & Srull, 1988). This tendency to conflate information may be exacerbated if the packaging of infant formula, follow-on formula and toddler milk products in the same range is very similar.

Further research is needed to determine whether claims about toddler milk products on infant formula or follow-on formula packaging influence perceptions of or purchase intentions towards infant formula products.

3. Perceptions and understanding of nutrient and ingredient claims

This section addresses the research question – How do caregivers perceive and understand nutrient content claims and ingredient claims on infant and follow-on formula?

3.1 FSANZ-commissioned research

The 2016 focus group research by Malek et al. (2019) examined consumer perceptions of nutrition content claims (e.g. 'high in calcium'), ingredient claims (e.g. 'contains fish oil') and health claims (e.g. 'contains calcium for strong bones'). When the research was conducted in 2016, some infant formula products on the market carried claims on their labels. The researchers considered it an opportune time to explore caregivers' perceptions of those claims.

Many caregivers in the focus groups indicated they did not understand nutrition content claims on infant formula. This included claims that stated either the full name or acronym of a nutritive substance (e.g. 'DHA' which stands for docosahexanoic acid). For some caregivers this was on account of claims being too 'scientific'. Consequently, some caregivers reported glazing over nutrition content claims and did not consider them helpful when assessing formula products. On the other hand, some caregivers reported health claims were helpful in their assessment of formula products. This was primarily on account of health claims being easier to understand and more meaningful as the benefits of a nutrient/substance were clearly stated, thus removing ambiguity around the nutrient/substance's purpose.

Despite many caregivers reporting they do not understand nutrition content claims, they often mentioned that claims are easier to follow than label elements such as the NIS and ingredient list. They explained that claims convey a nutritional benefit, as well as being easier to identify when they're placed on the front of a product. Caregivers in several focus groups reported looking for claims that referred to: immunity, fish oil, brain development, digestion, 'sleeping better' and 'full tummy'. With respect to immunity claims or statements, caregivers noted that infant immunity is often cited as a benefit to breastfeeding over using infant formula. They interpreted immunity claims on infant formula to mean that infants would receive the same immunity benefits from formula as they would from breastfeeding. Such claims were thus regarded as influential is assessing which infant formula products were better.

While labelling that compares infant formula to breastmilk is prohibited under the Food Standards Code, within this study some caregivers noted statements such as 'closest to breastmilk' or 'good as a breastmilk substitute' on infant formula are appealing. Around the time of the study some brands carried claims such as 'Inspired by the science of breastmilk'. Also, some products may carry a statement to indicate they are a breastmilk substitute. It is possible that caregivers interpreted these statements to mean the infant formula products were close to breastmilk. Caregivers indicated that such claims are appealing on the grounds they alleviated a sense of guilt associated with not breastfeeding. In one instance, such claims motivated a caregiver to use infant formula to top up their breastfeeds.

3.2 Additional literature search findings

The online qualitative study by Yockney and Comfort (2013) reported some Australian and New Zealand caregivers found claims useful. They considered that claims on follow-on formula and toddler milk products assisted them in comparing the broad benefits of one product compared to another. Some caregivers also indicated that claims on products are useful in identifying similar formula products when their preferred or usual brand is not available. Other caregivers were more sceptical and did not believe claims on labels. They perceived most brands tend to make similar claims to each other and caregivers felt such

claims are mostly marketing tactics to try and encourage consumers to purchase the product. They further considered the claims are not supported by evidence.

These findings suggest mixed views amongst caregivers in relation to claims on formula products (infant, follow-on and toddler milk).

The survey research by Jigsaw (2015) also examined caregivers' use of claims on infant formula products. 'Nutritional/health benefits' were the most common source of information mothers looked for on the label when they were choosing an infant formula. Respondents also rated the usefulness of the different label elements when choosing a formula. 'Product benefits and claims' were considered useful by 72% of respondents.

When respondents were asked an open-ended question about what other information they felt is missing or would be a useful addition to the label, the majority (70%) did not feel additional information was needed (Jigsaw, 2015). Of the 30% who nominated one or more pieces of information that should be added, the most common was ingredient info (12%). Respondents were also shown a list of additional information that could potentially be added to formula labels and indicated which of these they would like added. The most popular of these was 'Differences between gold and standard varieties' (50%). Thirty percent of respondents wanted 'Evidence of claims' added.

Focus group research by Parry et al. (2013) investigated women's interpretation of infant formula advertising, including nutrition and health claims that appeared in the advertisements. Four focus groups were held, one with preconceptional women (n=10), one with women pregnant with their first child (n=8), one with women who had at least one child under three years that had been formula fed (n=10), and one with women who had at least one child under three years that had been exclusively breastfed (n=6).

Participants initially expressed confidence about the superiority of breastmilk over infant formula (Parry et al., 2013). However, once they read the advertisements they started expressing concerns that the nutrients mentioned in the advertisements would not be in their breastmilk. They expressed doubts that the health benefits attributed to the formulas in the advertisements could be obtained from their breastmilk.

Participants understood from the advertising that as their baby developed they could change the formula they used to ensure their baby's changing needs were being met (Parry et al., 2013). In contrast, they were unsure whether their breastmilk would change to adapt to their baby's needs.

The advertisements also led some participants to conclude the formulas were as good as (or almost as good as) breastmilk (Parry et al., 2013). Participants were left with the impression that a great deal of research had been done to improve the composition of infant formula and reduce the discrepancy between breastmilk and formula. However, it is unclear to what extent this impression was created by nutrition content claims or ingredients claims (e.g. highlighting the presence of DHA) and how much was due to other features of the advertising. For example, participants were shown a Similac stool chart that showed colour photos of: breastfed stools, Similac Advance EarlyShield™ stools, and formula-fed stools. They inferred this formula would produce stools more similar to those of breastfed babies than other formula brands. It is possible the advertising participants viewed had other references to breastmilk[11], which also could have influenced perceptions about how similar

[11] American brands of infant formula mention breastmilk in range of ways. For example, one brand carries the claim 'Our Closest Formula to Breast Milk', some have nutrition content claims that mention the same nutrient is found in breastmilk, and some refer to breastmilk as part of the name of ingredients (e.g. 'Human Milk Oligosaccharide').

the products were to breastmilk. However, as the advertisements were not included in the publication this can't be checked for.

3.3 Conclusions

There are mixed views from consumers when presented with either nutrition content or ingredient claims. Some consumers regard them as helpful, while other consumers report disregarding them as they do not understand the specific nutrient/ingredient being claimed, or they considered claims in general to be marketing tactics.

Many caregivers reported that nutrition content claims aren't particularly helpful when compared to health claims that outline the benefit of a particular nutrient or ingredient. Claims that relate to 'immunity' or 'breastmilk' were perceived by some caregivers as appealing as they alleviated any sense of guilt associated with using infant formula rather than breastfeeding as recommended.

Qualitative research suggests the presence of nutrition content claims, ingredient claims and health claims can influence caregivers' perceptions of infant formula products. The claims can give caregivers a more favourable view of infant formula products, thereby making infant formula seem a close substitute for breastmilk. The presence of claims may influence caregivers' choice of infant formula. Claims may also reduce the level of guilt some caregivers experience when introducing infant formula.

4. Awareness and understanding of stage identification labelling

This section addresses the research question - "How aware and understanding are caregivers of stage identification label elements on infant formula products, including follow-on formula"

4.1 FSANZ-commissioned research

No research conducted or commissioned by FSANZ to date has investigated caregiver understandings of stage identification label elements on infant or follow-on formula products.

4.2 Additional literature search findings

Yockney and Comfort (2013) analysed caregiver responses to online forums to investigate consumer understandings of different 'formula' categories. Comments made by caregivers on the online forums were analysed to address whether caregivers differentiate between infant formula, follow-on formula and toddler milk.

Participants were asked to respond to the following question in the online forum "Let's start this forum with thinking about all the different stages and brands of formula and toddler milks that are available. What are all the formulas and milks suitable for babies and toddlers (just the ones that come to mind is fine)? Why would we use one over another?". Caregivers believed products were designed to meet the nutritional needs of infants or toddlers of a particular age. They saw the role of infant formula as a replacement or supplement for breastmilk. Infant formula could meet an infant's entire nutritional needs. In contrast, follow-on formula and toddler milks were seen as a supplement or top up to the diet. Caregivers noted that infants and toddlers receiving these products would also be eating complementary foods. They believed it was important to use an age appropriate product for their infant, although some caregivers did mention it was acceptable to wait an extra month or two past the recommended age range before transitioning to the next stage.

Caregivers varied in how they referred to the different product types. Some referred to stages (e.g. 'stage 1' or 'stage 2'), others referred to the age the product was appropriate for (e.g. '6 months'), or the product name ('infant formula', 'follow-on formula'). Throughout the discussion, the participants used the term 'formula' to refer to products for infants and toddlers. For example, one participant wrote "Stage formulas are for babies a certain stage. So stage 1 is for less than 6 months, stage 2 is for 6 to 12 months, and stage 3 is for one year plus" (Yockney and Comfort 2013, pg. 17). This is consistent with the findings from Berry et al. (2010) where participants understood 'formula' to be a category that includes products for infants and toddlers. Participants rarely used the term 'toddler milk'[12]. In other parts of the online forum research, participants often clarified the product they were using by including the brand name and an indication of the age or stage it was for (e.g. 's26 Gold Toddler formula', 'Nurture 3').

Notably, the researchers discovered some inconsistencies in how participants categorised the formula or toddler milk they were currently using. When they were recruited, participants were asked whether they currently used infant formula, follow-on formula, or toddler milk. In the online forums they were asked about the brand, product name and stage of formula they were currently using. Participants could also upload a photo of the product. In a small number of cases, the researchers found the information given in the recruitment screener contradicted that given in the online forum. For example, some participants who indicated in recruitment they were using infant formula were found (based on information provided in the

[12] The report contains around 170 quotes from participants. 'Toddler milk' appears in only three of those.

online forum) to actually be using a follow-on formula or toddler milk product. This suggests some caregivers' understanding of terms like 'infant formula', 'follow-on formula' and 'toddler milk' may differ from how they are used by government agencies and researchers. The researchers noted that caregivers in the online forums appeared to be providing age appropriate products to their infants and toddlers.

Within the online study, participants were asked to rank from a list of label elements[13] what they considered the most useful on formula products. Overall 'age information' was considered the most useful/important piece of information. This is mainly due to caregivers wanting to ensure they are buying the correct stage of formula for their child. This is partly driven by caregivers' perceptions that formulas vary in accordance with infants' nutritional needs over time. Furthermore, some caregivers reported this information is the most important as packaging can look similar across a product range and they wish to minimise the risk of using an incorrect stage.

An online survey commissioned by the Infant Nutrition Council (Jigsaw, 2015) also investigated caregiver use of formula stages. The survey consisted of 501 mothers with an infant aged between 0 and 24 months who had been fed infant formula between the ages of 0 and 12 months. Respondents were asked "what type of infant formula product did your 0-12 month old child start on?"[14]. Of those who started using formula within six months of birth (n=450), 35% reported they started with stage 2 formula (which is meant for infants aged six to 12 months). These mothers were reportedly less likely to have sought information from a healthcare provider. No further questions were asked to determine why these mothers had introduced follow-on (stage 2) formula early. It is possible some did not understand the age range it was designed for.

Mothers in the study were also asked about the information they had looked for on the label to help them make a decision and how useful each part of the label is when making a decision to purchase a formula product. Only 11% of mothers indicated they had used age or stage information on the label. However, this was an open ended question, where respondents typed in answers. It's likely that a higher proportion of respondents would have reported using age or stage information if this was listed. Age information was considered the most useful piece of information on formula labels with 86% of all participants (n=501) indicating it was useful. Stage information on labels was reported as the third most useful piece of label information overall with 81% of respondents indicating they found it useful.

While 'age' and 'stage' labelling was determined as being useful by the majority of respondents, the prior finding that some mothers with infants aged less than 6 months introduced stage 2 formulas to their infant suggests that stage labelling alone may not be sufficient information enough for caregivers to provide age appropriate formula to their infant.

4.3 Conclusions

Caregivers consider age information on infant formula, follow-on formula and toddler milk important. Caregivers believe products are specially designed for infants and toddlers of different ages and try to ensure they buy a product appropriate for the age of their infant or child. Caregivers differentiate between formula products based on stage labelling (e.g. 'stage 1'), age information (e.g. '0–6 months') and the product name (e.g. 'infant formula'). Of these three methods of differentiating between products, 'age information' is considered the most

[13] List of label elements asked to rank in order of usefulness: trademarks, claims, declaration of protein type, product description, brand, ingredients, age information.
[14] The response options were: "Stage 1 Newborn / Starter Infant Formula – 0-6 months", "Stage 2 Progress / Follow On Infant Formula – 6-12 months", "Specialty Formula (e.g. Soy, Lactose Free, Reflux, Goat, Comfort)".

useful and important by consumers of infant formula. From the findings it is arguable that age information is considered the most important as it gives context to caregivers as to the suitability of a product for their infant.

The research suggests some caregivers' understanding of terms like 'infant formula', 'follow-on formula' and 'toddler milk' differ from how they are used by government agencies and researchers. For example, caregivers may use the term 'formula' to refer to products for toddlers.

Of note is the finding some caregivers reported introducing an infant aged less than 6 months to stage 2 formula. Further research is needed to determine the prevalence of caregivers providing formula or toddler milk products to infants before the recommended age in Australia and New Zealand.

In addition, the reasons that caregivers provide inappropriate (for the infant's age) formula or toddler milk products are not understood. Caregivers may do this inadvertently if they do not read or understand the label. However, it's possible that some caregivers knowingly provided follow-on formula or toddler milk before the recommended age. For example, because they do not understand the risks of doing so.

No research was found where caregivers were actually tested on their understanding of stage labelling. Much of the research described above relied on caregivers self-reporting the type of product they were using.

The findings of the literature review support clearly displaying age information to assist caregivers to select appropriate products for their infant.

5. Perceptions and use infant formulas designed for special dietary purposes

This section addresses the research question - "How do caregivers perceive and decide to use infant formulas designed for special dietary purposes"

5.1 FSANZ-commissioned research

In the focus group conducted by Malek (2018a), caregivers report using different infant formula varieties for specific needs. Caregivers indicated they would use formulas designed for specific nutrition/health outcomes when they have a clear infant health outcome to attend to (e.g. needing to increase infant weight, micronutrient deficiencies, gut issues). It was not identified how caregivers become aware of their infants' health needs or whether caregivers sought medical advice before using specific formulas designed for dietary purposes.

5.2 Additional literature search findings

One qualitative study examined health professionals' perceptions of caregivers' information needs with infant feeding (Dykes, Richardson-Foster, Crossland, & Thomson, 2012). This captured some reflections on infant formulas designed for special dietary purposes. The aim of the study was to evaluate the Infant Feeding Information Team intervention introduced at two North West England health centres. Researchers conducted seven focus groups (n=34) and 68 semi-structured interviews (some face-to-face and some via telephone) with staff at the centres.

The researchers found some staff believed that caregivers struggled with infants going through unsettled or difficult periods. Staff would advise caregivers that it was normal for infants to go through these periods. However, they mentioned caregivers would attempt a number of interventions, which staff considered unnecessary, to address the problem. These included introducing follow-on formula or complementary foods (solids) earlier than recommended, seeking a diagnosis to explain the problem (e.g. lactose intolerance), and seeking a prescription for medicine or special formula to address the problem. The staff believed that pursuing these interventions made caregivers feel less stressed and appeased their concerns. However, they expressed concern that the interventions (especially early introduction of follow-on formula and complementary foods) could be harmful for the infants.

One longitudinal study from the United States examined which factors influenced mothers' choice of infant formula and their reasons for switching infant formula products (Huang, Labiner-Wolfe, Huang, Choinière, & Fein, 2013). Pregnant women (n=1700) were recruited from a nationally distributed consumer panel. Respondents answered mail questionnaires at six time points: during pregnancy, when the infant was up to one month old, two months, five months, seven months, and nine months. Respondents using infant formula were asked about the reasons they chose the product they were using at one, two, five, seven and nine months. Eight percent indicated they had chosen a formula because it was 'Labeled as useful for baby's problem' at one month. This proportion was similar at two months (12%), five months (11%), seven months (10%) and nine months (10%).

Respondents who had changed the infant's formula in the last two weeks[15] were asked whether the change was due to a the infant having a problem with the formula they were using (Huang et al., 2013). In the first month, 56% of respondents answered 'Yes' to this question. This became a less common reason as the infant developed. Forty nine percent of respondents answered 'Yes' at two months, 40% at five months, 19% at seven months and

[15] The percentage of respondents who had changed the infant's formula in the last two weeks was highest in the first month (27%), followed by the second month (17%). By nine months, 10% of respondents reported changing their infant's formula in the last two weeks.

22% at nine months.

Respondents who changed the formula due to a health problem were then asked about the type of problem the infant had (Huang et al., 2013). When the infant was in its first month, the most common problems were: too much gas (67%), too much spit up (43%), constipation (35%), vomiting (15%), an allergic reaction/intolerance (13%), other problem (13%), diarrhoea (12%), too much mucus (4%). At nine months the most common problems were: too much spit up (34%), constipation (31%), too much gas (31%), vomiting (26%), other problem (23%), diarrhoea (20%), an allergic reaction/intolerance (14%), and too much mucus (6%).

Respondents also reported the type of formula they were using at each of the six time points (Huang et al., 2013). The majority of respondents were using a milk-based or soy-based formula. The proportion of formula users who used an extensively hydrolysed casein hydrolysate formula ranged from two percent to four percent over the course of the study. Amino-acid based formula were less commonly used. At one month 1.1% of formula fed infants were consuming an amino-acid based formula. At nine months this was 0.7%.

These results suggest it is common for caregivers to believe health problems experienced by their infant are caused by the formula they are using. This often leads to a change of formula. The analysis by Huang et al. (2013) did not examine whether the mothers switching formulas for these reasons were the same mothers who reported choosing a formula because it was labelled as useful for their infant's problem. However, it seems likely that caregivers who believe their infant is constipated (for example) would look for an infant formula that claims to help constipation or make stools softer.

It is also unknown how many of the formula changes were on the advice of a health professional. However, the researchers did collect data on whether the mother had discussed their choice of formula with the infant's doctor. At one month, 46% of formula feeding respondents had discussed the choice of formula with a doctor. This was slightly higher at two months (54%) and at five (55%), seven (55%) and nine months (55%).

The Australian survey by Jigsaw (2015) did not specifically examine consumer perceptions of infant formulas for special dietary uses, but it provides insights on caregivers' decision making in relation to formulas. The study found six percent of formula feeding mothers who started infant formula within six months of birth used a specialty formula. The examples given of specialty formula in the questionnaire included soy, lactose-free, reflux, goat and comfort formulas. Among formula feeding mothers who introduced formula between seven and 12 months of birth, six percent started with a specialty formula.

The Jigsaw survey (2015) also collected information on caregivers' advice seeking. Fifty seven percent of mothers who used formula reported they had sought information about formula from a health care practitioner (e.g. their GP or midwife). However, the question was about seeking information on formula generally, not specifically about the type or brand of formula they were planning to use. Among mothers who introduced formula in the first three months of the infant's life, 62% sought advice from a health care practitioner.

Similar to the research reported by Huang et al. (2013), the perception that a formula is linked to health problems in an infant was common in the Jigsaw (2015) survey. Among mothers who switched the formula product they were using, 40% reported this was because their infant was unwell with the formula they were on.

In the focus group research conducted by Parry et al. (2013), participants saw advertisements for various infant formula products, including some claiming to assist with colic, fussiness/gas and spit-up. At the start of the focus groups (conducted in the United

States), participants were confident that breastfeeding was best for babies. However, as they read the advertisements they lost confidence in the superiority of breastmilk. The idea that some formula products were specially formulated to address problems like reflux and colic appealed to the participants. In contrast, breastmilk was perceived as unchanging. Breastfeeding, unlike formula feeding, would not give them the option of changing their baby's food to address specific needs like reflux. This sentiment is illustrated by the following quote from one of the participants "You can't change your milk, but I can change my formula and maybe that will solve my problem…" (Parry et al., 2013, p. 120).

The advertisements also suggested to participants that what a baby was eating (including breastmilk) could be the cause of problems like colic and gas (Parry et al., 2013). One participant noted that issues like colic are often not related to the formula or breastmilk the baby is consuming. However, they felt the advertisements made it seem like what the baby was eating was causing the problem. One participant said "I feel like it does imply that these can be solutions to problems caused by breastfeeding." (Parry et al., 2013, p. 120).

5.3 Conclusions

Very little evidence from Australia and New Zealand was found on how caregivers perceived infant formulas for special dietary purposes and how they decide to use them. However, it does appear common for Australian caregivers to believe problems experienced by their infant are due to the formula they are feeding.

This aligns with the findings from the international research that suggests caregivers are motivated to use formulas designed for special dietary purposes when they believe their infant is experiencing problems. The marketing of formulas for problems such as colic and reflux suggests to some caregivers that what the infant is eating must be causing the problems and can imply that changing (either from another formula or from breastfeeding) to a specialised formula for the condition will solve the problem.

It is unclear what proportion of caregivers would do this without first seeking advice from a health professional. Evidence from the United States suggests that around half of mothers discuss their choice of formula with a doctor. However, this rate is not specific to caregivers considering a special formula (who may be more likely to consult a doctor). Evidence from Australia suggests it is common for caregivers to discuss formula feeding with a health care practitioner, but it is not clear how often they would discuss their choice of formula.

6. Information sources beyond ‘on tin labelling’

This section addresses the research question - “Are sources of information beyond ‘on tin labelling’ helpful in guiding caregiver choices and understanding of infant formula”

6.1 FSANZ-commissioned research

Malek (2017) examined sources of information from which caregivers seek information regarding preparation and/or storage of infant and follow-on formula. Of 285 Australian and 341 New Zealand caregivers, 57% and 62% respectively reported they seek preparation and storage information from product labels. Second to seeking information on labels, midwives were reported as a main source of information regarding preparation and storage instructions (28% of Australian and 37% of New Zealand caregivers). Close to a third of respondents in both Australia and New Zealand reported family members, as well as friends who have previously used infant formula as other sources of information regarding preparation and storage of formula products.

Other main sources caregivers reported seeking information from included general practitioners (22% of Australians and 19% of New Zealanders), paediatricians (21% of Australians and 9% of New Zealanders), nurses (21% of Australians and 24% of New Zealanders), and online parenting/baby forums (24% of Australians and 22% of New Zealanders).

The survey results suggest that a sizeable proportion of caregivers report seeking information concerning the preparation and storage of formula from product labels. But caregivers are also seeking information elsewhere, primarily from healthcare professionals and friends and family.

The findings of this study indicate that while caregivers report ‘on tin’ information as important, they also identify recommendations from healthcare providers as important to making informed decisions.

The 2018 focus group research by Malek (2018a) investigated whether caregivers believe ‘off-label’ sources of information assist their abilities to make informed decisions in relation to infant and follow-on formula products. In general, caregivers reported that healthcare professionals were regarded as trusted and influential sources of information when considering the use of formula products. However, it was noted that while caregivers expect healthcare providers to be equipped with information concerning infant formula, not all healthcare providers are a direct source of information. Caregivers in such circumstances indicated they would trust referrals from their healthcare providers to further sources of information to assist their decisions.

A preference for both printed and online sources of information was expressed by caregivers. Caregivers preferred these because they could be viewed when it was personally convenient. Focus group participants noted that ‘off-label’ information would be helpful if it could offer guidance on how to interpret the ‘on tin’ label, as well as inform consumers that all products are safe and appropriate for infants.

The online survey by Malek (2018b) examined caregiver behaviour regarding seeking alternate information sources on infant formula. Out of 906 respondents to the survey, 78% reported seeking additional information beyond the on-label information provided on infant and follow-on formula. Seventy-two percent of respondents indicated they had sought information specifically from their healthcare providers. Just under two thirds of respondents indicated receiving information concerning the use of infant formula from healthcare

providers.

When asked about their abilities to personally make appropriate formula choices, just over two thirds of respondents felt confident in their ability to make informed decisions. However, less than half of those respondents felt informed enough to truly make informed comparisons between products. The top three pieces of information caregivers wished to know (that weren't provided on labels) were: the key nutrients to look for, information explaining that all formula sold in Australia and New Zealand provide the same base nutrition requirements, and which nutrients are commonly associated with infant reactions/symptoms such as reflux and constipation.

6.2 Additional literature search findings

Appleton's qualitative interview study of 24 Australian caregivers (2018) investigated formal[16] and informal[17] information sources used by caregivers. Some caregivers reported receiving unsolicited advice from informal sources while some reported seeking information from formal sources concerning the use of infant formula when they had reason to do so (e.g. infant health issues, daily intake concerns). In general, caregivers who reported receiving formal advice mentioned that it was often after they had commenced using formula products. Given that healthcare professionals appeared hesitant to provide information until after formula was being used, the majority of caregivers reported that informal information sources were the main influence on their decisions and were the primary source of information sought.

Appleton et al. also examined mothers' information sources in a survey (2020). The survey of formula feeding (n=81), breastfeeding (n=157) and mixed feeding (n=32) mothers was carried out when their infants were around six months old. Among formula feeding and mixed feeding mothers, the packet/tin of formula was used by 90%, making it the most common source of advice on formula feeding. A small percentage of formula feeding and mixed feeding mothers (8%) relied on the packet/tin as their only source of information on formula feeding. The other information sources, from most to least used, were: maternal and child health nurse (66%), friends (62%), family (54%), midwife (53%), online (48%), practice nurse (39%), and pharmacy (37%).

The information on the packet/tin was generally considered very helpful (39%) or somewhat helpful (59%) by the mothers who used it (Appleton et al., 2020). Only 2% considered the information not at all helpful. The other information sources were also generally considered helpful by those who used them. The information sources most likely to be rated as not at all helpful were family (20%), pharmacy (17%) and midwife (14%). Online was considered very helpful by 19% of users, somewhat helpful by 70%, and not at all helpful by 11%.

The above finding that caregivers who use infant formula find seeking formal advice difficult is supported by a systematic review of mothers' experiences of formula feeding (Lakshman, Ogilvie, & Ong, 2009). It was found many mothers who fed their infant with formula were not given adequate information from healthcare providers. Both breastfeeding and formula feeding mothers considered more time was spent by hospital midwives with breastfeeding mothers. While healthcare providers were the most frequent source of information for mothers, mothers were more likely to initiate discussions with friends and family to elicit information concerning the use of formula products. The authors suggest this is due to a perception on behalf of mothers that healthcare providers don't support infant formula use.

[16] Formal information sources included: midwives, doctors, community maternal and child health nurses, general practitioners, paediatricians and pharmacists.
[17] Informal information sources included: on tin labels, internet information, family, friends and other parents.

A focus group study of 14 New Zealand mothers (Winstanley & Cressey, 2008) previously discussed in this review found most mothers access a wide range of formal and informal sources of information. As most mothers approach birth with an intention of breastfeeding, information on preparation of infant formula is often not sought and generally not provided until the point in time when it is immediately needed.

Mothers at this point in time are often information hungry and seek information about infant formula. Information about preparation of formula in particular was usually less than caregivers considered they required. Information on infant formula tins was viewed as available, authoritative and trusted and was the major information source for most caregivers. Information from health professionals was valued and trusted, when it was provided. However, in many cases the health professional available at the time was unwilling or unable to provide the necessary information. According to mothers involved in the focus groups, a number of health professionals believed they were 'not allowed' to provide information on formula feeding. Information from family, friends, and other informal sources tended to be reviewed and accepted if it was found to be useful, however for some caregivers their family was the only source of information.

A study identified earlier in this review (Yockney & Comfort, 2013) investigated caregiver approaches toward seeking information regarding the use infant formula. In general, caregivers seek information about whether they should use formula, and what product (brand and type) other caregivers recommend. This information gathering on behalf of caregivers is primarily done pre-purchase. They seek information from both medical/professional sources, and other caregivers with experience using formula. Their information needs centre around which is the best substitute for breastmilk (particularly important for early starters who need to use formula products as a replacement for breastmilk). Caregivers also seek information about the effect of formula on their baby (for example, does formula cause constipation, wind or other digestive issues).

Other pre-purchase information channels include websites such as Plunket[18] or manufacturers' websites. If their child was provided formula in hospital (particularly for premature babies), caregivers tend to use the brand and type of formula that their child received at that time. All these sources of information have a strong influence on initial purchase, as caregivers rely strongly on recommendation from others. Ultimately the child's acceptance of the formula was the key driver continue usage or change formula product.

6.3 Conclusions

From the research identified in this review it is apparent that many caregivers seek off-label advice. In particular caregivers report seeking and valuing advice from healthcare professionals. Key pieces of information users of infant formula wish to ascertain about infant formula that they cannot receive from on product labels are: what key nutrients they should look for, knowledge that all formula sold in Australia and New Zealand are safe and appropriate for infants, knowledge of nutrients that associated with infant reflux and constipation, as well as which products most closely resemble breastmilk.

While caregivers who use infant formula seek and value the information they receive from healthcare professionals, they report difficulties obtaining information from such sources. Findings indicate that caregivers relied on informal information sources when deciding to commence using infant formula and that professional advice concerning use of infant formula was only provided by healthcare providers once infant formula feeding had begun.

[18] Plunket is New Zealand's largest provider of support services for the development, health and wellbeing of children under 5.

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Appendix A: Method

This report reviews the available literature for the following six review questions:

1. Does the format of the nutrition information statement and ingredient list enable caregivers to make informed choices? If not, what changes would enable them to make informed choices?
2. Does the proxy advertising of later stage formulas (12 months +) on infant or follow-on formula influence perceptions and purchase intentions toward infant formula?
3. How do caregivers perceive and understand nutrient content claims and ingredient claims on infant and follow-on formula?
4. How aware and understanding are consumers of stage identification label elements on infant formula products, including follow-on formula?
5. How do consumers/caregivers perceive and decide to use infant formulas designed for special dietary purposes?
6. Are sources of information beyond 'on tin labelling' helpful in guiding the understanding and use of infant formula?

The above set of six research questions were a part of a broader search outlined in Appendix A of the SD4 Consumer research paper released as part of the 2021 Safety & food technology Consultation paper[19]. Accordingly the numbers of studies identified, screened and reviewed etc. here refer to the complete literature search, not just to literature specific to the six research questions above.

These research questions were responded to using a three-tiered approach to identify relevant research and literature to address the questions: a search of FSANZ accessible online journal articles; relevant grey literature and government reports; and FSANZ-commissioned research conducted to address and inform P1028. The following online journal databases available to FSANZ were searched:

- SocINDEX with full text
- EconLit with Full Text
- Food Science Source
- Food Science and Technology Abstracts
- Medline with full text
- ScienceDirect

Two search strings were used to identify relevant published literature. Searches were for full text peer-reviewed articles published in English since 2003.

- AB (Infant OR baby) AND AB (formula OR powder) AND AB (label* OR market* OR promot* OR advert* OR warning*)
- AB (Infant OR baby) AND AB (prep* OR instruct*) AND AB (formula* OR powder)

Initial article search returns were 1592 for search string one and 973 for search string two. However, removal of articles not related to the topics below reduced the number of articles to 96 and 483 articles respectively:

- infant formula
- infant formulas
- breast feeding

[19] See FSANZ website for proposal P1028: P1028 – Infant Formula (foodstandards.gov.au)

- infant nutrition
- food labelling
- food handling
- infant care
- health knowledge attitudes practice
- bottle feeding
- milk substitutes
- feeding behaviour

Removal of duplicate articles (n=385) resulted in a final count of 194 potential articles.

Eight additional grey literature reports were identified that directly address the nine research questions and were included. The grey literature included reports published by government bodies (e.g. New Zealand Ministry for Primary Industries and the United Kingdom Food Standards Agency) and work commissioned by industry (e.g. the Infant Nutrition Council).

Five studies commissioned by FSANZ (including two peer-reviewed published articles) were also included in this review search. A previous consumer research review conducted as part of the current proposal (P1028) identified that an evidence gap exists in recent consumer research relevant to Australian and New Zealand populations that directly addresses infant formula labelling. As such, FSANZ invested in primary research to better inform consumer considerations related to the labelling of infant formula.

The quality of each study was assessed against the following criteria to deliver a rating of low, medium or high.

- Theory/Aims/Justification: the study is appropriately justified with clear aims; the study is located in the body of existing theory
- Population/sampling: population being sampled is relevant to the aims of the study; sampling techniques appropriate and clearly detailed
- Methods: methods used are appropriate to the sample and the aims of the study; measures, tools, questionnaires and guides used described
- Analysis: analysis is appropriate to the data collected, details of statistical testing included, qualitative analysis explained, coding frames explained
- Reporting: results reported with appropriate discussion, limitations identified and discussed

Appendix B: Summary of studies

Table B1: Studies and reports contained in the review

Authors	Country, study population and sample size	Study aim	Design	Key findings	Study quality
FSANZ-commissioned research					
Malek (2017)	Australia and New Zealand; Caregivers of infants <18 months who received formula n=626	Determine use and understanding of nutrition and ingredient labelling. Examine preferences toward formatting of preparation and use instructions.	Quantitative – Online survey with required sample size estimates based on population statistics	Percentages of caregivers who wish to know the adverse outcomes associated with not following prescribed on label preparation instructions. Perceived importance of different label elements on infant formula packaging.	Medium
Malek (2018a)	Australia and New Zealand; Caregivers of infants aged <12 months who received infant formula n=92	Explore if changes to the nutrition information statement assist consumers and examine sources of information that inform decisions	Qualitative – 16 Moderated varied socio-demographic Focus Groups	Caregivers have preferences toward nutrition labels being standardised with nutrients grouped together (e.g. minerals, vitamins, optionals). Caregivers were confused by the 'optionals' term and prefer less ambiguous terms. Caregivers report seeking but not obtaining information from trusted healthcare professionals.	High
Malek (2018b)	Australia and New Zealand; Caregivers of infants aged <24 months who received infant formula n=906	Examine caregivers' preferences for alternative information sources.	Quantitative – Cross sectional online survey	Proportion of caregivers who reported seeking information beyond the package from healthcare providers.	High

Authors	Country, study population and sample size	Study aim	Design	Key findings	Study quality
Malek et al. (2019)	Australia and New Zealand; Caregivers of formula fed infants n=136	Increase understanding of caregivers' interpretation and use of formula nutritional labelling	Qualitative – Cross sectional focus groups	Caregivers' do not understand many of the nutrients and ingredients contained in formula, but still use nutritional labelling to compare products (e.g. based on length of nutrients to indicate product quality). Ingredient lists are used to identify potential problem ingredients for health reasons (allergies/intolerances)	High
Additional research					
Appleton et al. (2018)	Australia; Parents of young infants n=24	Explore parents' infant formula feeding practices to understand usage and what factors influence this	Qualitative – In depth semi structured interviews	Most caregivers report adhering to the preparation instructions provided on formula products. Some caregivers report deviations of instructs based on medical advice. Caregivers reported receiving primarily informal advice concerning formula use rather than formal (health care professionals).	Medium
Appleton et al. (2020)	Australia; Mothers of infants aged six months n=270	Explore the sources of advice used by parents to feed their infants. Also to compare the sources of advice used by formula feeding mothers and breastfeeding mothers.	Quantitative – Secondary analysis of online survey. Survey was part of a longitudinal cohort study	Around one fifth of formula feeding mothers did not receive any advice on formula feeding from a professional source. In contrast, only one in twenty breastfeeding mothers did not receive any advice on breastfeeding from a professional source. The packet/tin was the most common source of advice on formula feeding and was considered either very or somewhat helpful by the majority of mothers who used it.	Medium

Authors	Country, study population and sample size	Study aim	Design	Key findings	Study quality
Berry et al. (2010)	Australia; Women aged >18 years who were pregnant with their first child n=15	To examine what pregnant women believed advertisements for toddler milks were trying to tell them and to examine how they responded to these messages.	Qualitative – Semi-structured interviews. Interviewees were shown print advertisements for toddler milk products.	When they first saw the advertisements, most interviewees tended to report that the products advertised were 'formula', 'baby formula' or 'infant formula'. Once they started reading through the advertisement (at the request of the interviewer) they noticed that the products were for toddlers. Many of the interviewees mentioned that they would not normally have read enough of the advertisement to realise the product was for toddlers.	High
Berry et al. (2011)	Australia; n=17, composed of: 1 general practitioner, 1 community dietitian 4 mothers/expectant mothers 4 grandmothers/ expectant grandmothers 7 Child and Family Health nurses	To explore commonly used sources of information on formula milk products, how toddler milk advertisements are interpreted and how the claims in advertisements are evaluated.	Qualitative – Semi-structured individual and group interviews. Interviewees were shown print advertisements for toddler milk products.	All types of interviewees (GP, community dietitian, mothers/expectant mothers, grandmothers/expectant grandmothers, and CFHNs) believed health professionals are an important source of information about infant formula for mothers. The health professionals reported that mothers had asked them about which infant formula to use. Many interviewees reported that other mothers and grandmothers were a source of information for mothers. When they were shown toddler milk advertisements, interviewees tended to say they were for 'formula'. Some indicated they understood the product was intended for children >12 months but used the term 'formula' to describe the product.	Medium
Berry et al. (2012)	Australia; Parents with a child <5 years or people expecting a child n=439	To investigate whether Australian parents recall seeing advertisements for infant formula products and the messages they recall from the advertisements.	Quantitative – Survey conducted face to face using a convenience sample	92% of respondents believed they had seen an advertisement for formula. Of those respondents, 93% reported seeing an advertisement that was not from a retailer. 67% believed they had seen a formula that was suitable from birth advertised. 91% reported they had seen one or more of the	High

Authors	Country, study population and sample size	Study aim	Design	Key findings	Study quality
				five pictured infant formula products advertised.	
Dykes et al. (2012)	United Kingdom; Health-care staff from two maternity/ primary health-care facilities in North-West England n=102	To conduct an in-depth evaluation of the Infant Feeding Information Team (IFIT), which was established to evaluate information on infant feeding and disseminate evidence-based information to health-care staff	Qualitative – focus groups (seven focus groups, n=34) and semi-structured interviews (n=68)	Health-care staff perceptions of how caregivers deal with unsettled infants and the reasons for this.	Medium
Huang et al. (2013) Also, relied on data tables published on CDC site: https://www.cdc.gov/breastfeeding/data/ifps/results.htm	United States; Pregnant women recruited from a nationally distributed consumer panel n=1700	To evaluate the association between formula marketing, reasons for choosing a particular formula and switching brand or product in infant's first 9 months	Quantitative – Cross sectional mail survey	Among mothers who introduced infant formula in first month, 6.7% chose the product because it was 'Labeled as useful for baby's problem'. Among mothers who switched infant formula products, in the first month this was due to the infant having a problem with the formula in 56% of cases. This was a less common reason as the infant got older (only 22.2% at 9 months). Most common health related reasons for a formula change in first month were: too much gas (67%), too much spit up (43%), constipation (35%), vomiting (15%), an allergic reaction/intolerance (13%), other problem (13%), diarrhoea (12%), too much mucus (4%).	High
Jigsaw (2015)	Australia; Women with children aged <24 months who received infant formula	Identify influencers on formula use decisions, as well as the sources and types of information used to make informed	Quantitative – Cross sectional online survey with confidence intervals established for	Mother's use of stage labelling on infant formula. % of parents who reported feeding stage 1 and 2 formulas at different infant ages.	High

Authors	Country, study population and sample size	Study aim	Design	Key findings	Study quality
	before 12 months n=501	decisions.	population estimates	Perceived usefulness of different label elements with age information regarded as most useful. Reporting that nutrition information informs purchase decisions.	
Parry et al. (2013)	United States; Women who: were preconceptional (n=10), were pregnant with their first child (n=8), had ≥1 child aged <3 years and were fed their youngest child formula (n=10), had ≥1 child aged <3 years and exclusively breastfed their youngest child (n=6)	To increase the understanding of how women interpret infant formula advertising	Qualitative – Focus groups. Participants were shown examples of infant formula advertising.	Participants initially expressed confidence about the superiority of breastmilk over infant formula. However, once they read the advertisements they started expressing concerns that the nutrients mentioned in the advertisements would not be in their breastmilk. They expressed doubts that the health benefits attributed to the formulas in the advertisements could be obtained from their breastmilk. Participants understood from the advertising that as their baby developed they could change the formula they used to ensure their baby's changing needs were being met. In contrast, they were unsure whether their breastmilk would change to adapt to their baby's needs. Participants also believed, based on the advertisements, that an advantage of formula feeding over breastfeeding was the ability to use a product specially formulated to address problems (e.g. reflux) their baby might have.	High
Winstanley and Cressey (2008)	New Zealand; Caregivers of infants <6 months receiving infant formula	Obtain information about preparation, use, storage, sources of information and knowledge of product safety.	Qualitative – Focus Group	Parents generally discarded unfinished feeds. Among those who did not, this was generally for cost reasons. Hygiene and adhering to preparation instructions was considered important but not well understood	High

Authors	Country, study population and sample size	Study aim	Design	Key findings	Study quality
	n=14 Across 3 focus groups			as to why. Parent's reported finding it difficult to obtain information from health professionals.	
Yockney and Comfort (2013)	Australia and New Zealand; Caregivers of infants aged 6 to 36 months n=137	To examine consumer understanding, perceptions and uses of infant and follow-on formulas.	Qualitative – Analysis of three online discussion forums developed for research participants	Information caregivers consider most important contained in preparation instructions. Preparation standards decline as infant age increases The perceived importance of label elements on formula products Information sources caregivers seek and use.	High

Table A2: Systematic and narrative reviews included

Authors	Review Type	Content
Lakshman et al. (2009)	Systematic Review	Review of qualitative and quantitative studies examining mothers' experiences of formula feeding.