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## **Attachment 1 – Rapid Systematic Evidence Summary on Infant Formula Stage Labelling and Proxy Advertising**

Supporting Document 3

Labelling for Infant Formula Products

Proposal P1028 - Infant formula 2<sup>nd</sup> CFS

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### **Executive Summary**

To inform the P1028 1<sup>st</sup> Call for Submissions, Food Standards Australia New Zealand (FSANZ) prepared a literature review of consumer research relating to the labelling of infant formula products (IFPs) (IFP labelling literature review)<sup>1</sup>. This rapid systematic evidence summary builds on the IFP labelling literature review by assessing social science evidence from January 2003 to May 2022 on three gaps in the literature identified by the IFP labelling literature review. The full IFP labelling literature review was not updated. The three research questions included:

1. Does toddler milk marketing on IFP labels (including follow-on formula labels) influence caregiver perceptions and purchase decisions for IFPs?
2. How do caregivers understand stage labelling on IFPs, including follow-on formula?
3. Why are caregivers choosing the wrong formula for their infant, despite age and stage labelling?

Seven additional studies were identified, of which two were from Australia. No studies were found from New Zealand. This report outlines the methodological approach to the evidence summary, summarises the gaps from the IFP labelling literature review and outlines relevant findings from the IFP labelling literature review and the evidence summary. Key findings are summarised below, grouped by research question. The results from international studies may not be generalisable to Australia and New Zealand, due to potential differences in infant nutrition literacy and exposure to IFP advertising, as well as differences in cultural or regulatory environments.

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<sup>1</sup> See FSANZ 2022, *P1028 First Call for Submissions - Attachment to SD3: Consumer research on infant formula labelling*. Available at:  
<https://www.foodstandards.gov.au/code/proposals/Documents/Attachment%201%20to%20SD3%20-%20Consumer%20research%20on%20infant%20formula%20labelling.pdf>

### Does toddler milk marketing on IFP labels (including follow-on formula labels) influence caregiver perceptions and purchase decisions for IFPs?

- The IFP labelling literature review highlighted that some caregivers who see advertisements for toddler milk believe they have seen advertisements for infant formula, or associate claims seen in toddler milk adverts with IFPs. This was particularly true when an advertisement was glanced at and not read carefully.
- This evidence summary did not find any studies that specifically examined the effect of toddler milk marketing on infant formula or follow-on formula labels. For example, statements such as 'contains 16 essential vitamins and minerals' appearing on infant formula labels, where the statement refers to a toddler milk in the same product line.

### How do caregivers understand stage labelling on IFPs, including follow-on formula?

- Stage labelling (labelling infant formula, follow-on formula and toddler milk as stages 1,2,3) is used by some caregivers to differentiate between formula products. However age labelling ('suitable for ages...') is important to guide understanding of stage labelling, with the information often used together when making initial purchase decisions.
- The meaning of stage labelling is not always well understood by pregnant women. Sixty-five percent of a sample of 80 Italian women misinterpreted a stage label at first glance when it was presented in the context of a follow-on formula advertisement, with 35% continuing to misinterpret after careful reading. Some incorrect interpretations may lead to confusion about the appropriate product for a child's age (e.g. 'for two month olds'), or appropriate formula preparation and servings (e.g. 'two cups').
- In some countries, stage labelling may encourage caregivers to continue formula feeding beyond infancy and early childhood. However, this effect may be reduced with messaging from health professionals that later stage products are not required.
- Australian and New Zealand caregivers generally understand that each stage has a specific nutrient composition designed to meet the needs of children at a certain age. Ensuring that children get the correct nutrient composition for their age was a key reason for moving to the next stage. Once caregivers have found a brand that their infant accepts, they will generally remain with that brand throughout the stages. However, it is not clear the extent to which stage labelling influences these perceptions and behaviours, relative to other information sources and labelling elements. It is also unclear whether caregivers perceive nutritional benefit in progressing through the stages, relative to non-formula sources of nutrition.

### Why are caregivers choosing the wrong formula for their infant, despite age and stage labelling?

- Caregivers may not always provide the correct formula product for their child's age. In two studies of Australian caregivers, infants were typically served the correct formula type for their age. However, one Australian study found that 35% of surveyed mothers who introduced formula within 6 months of birth started with follow-on formula, which is intended for children between 6–12 months. These mothers were less likely to have sought advice from a health care provider about the provision of IFPs.
- In the United States (US), one study identified that 22% of 6-11 month olds consumed toddler milk in the last month, with 10-11% consuming it as their most common milk product, and 7% consuming it daily. In addition, 50% toddlers aged 13-36 months consumed infant formula (including follow-on formula) in the past month, with 39% consuming it as their most common milk product and 20% consuming it daily.

- A substantial proportion (18-24%) of US caregivers provided both infant formula (including follow-on formula) and toddler milk to their child. This suggests that they may not always be seen as substitute products, or that consumers may be confused about the distinction between the products. Most infants aged 6-11 months who were served toddler milk were also served infant formula, with just 4% of the 22% who consumed toddler milk not consuming any infant formula.
- Caregiver confusion about the formula product they are purchasing may be contributing to incorrect formula provision. In international research, caregivers reported being confused about the difference between infant formula, follow-on formula and toddler milks and noted it was sometimes not clear which age group formulas were intended for. This confusion was linked to similar branding, packaging and shelf locations in stores, line extensions, and a lack of consistent statement of identities for IFPs or toddler milks.
- Some of these factors are unlikely to be contributing to confusion in the Australian and New Zealand market, due to prescribed names and requirements for age information on IFP labels under the Australia New Zealand Food Standards Code. However similar branding and packaging, line extensions and shelf locations may be relevant to Australia and New Zealand, with some caregivers reporting using age labelling to minimise the risk of buying an incorrect stage where packaging is similar across a product line.
- US caregivers also raised that the lower price of toddler milks relative to IFPs may encourage their provision to younger infants if caregivers do not understand the different nutrient compositions.
- Variation in the age at which caregivers transition children between formula stages, or away from infant formula, may also be contributing to incorrect formula provision. Delays in transitioning may occur to avoid digestive upsets or palatability changes.

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## Objective

To inform the P1028 first Call for Submissions, Food Standards Australia New Zealand (FSANZ) conducted a literature review of consumer research relating to the labelling of infant formula products (IFPs) (IFP labelling literature review)<sup>2</sup>. The IFP labelling literature review examined studies from January 2003 to September 2019, and included consideration of the impacts of stage labelling and proxy advertising of IFPs on caregiver behaviour. Proxy advertising refers to references made to other products on the label of an infant formula or follow-on formula product. Stage labelling refers to the labelling of infant formula, follow-on formula, and toddler milks as stages 1, 2 and 3 respectively.

This paper presents the results of a rapid systematic evidence summary of literature from January 2003 to May 2022, undertaken to inform the assessment of risk relating to stage labelling and proxy advertising for P1028. Specifically, the evidence summary assesses three gaps identified in the IFP labelling literature review, to confirm whether additional evidence was available. The full IFP labelling literature review was not updated.

The three research questions derived from identified gaps in the literature included:

1. Does toddler milk marketing on IFP labels (including follow-on formula labels) influence caregiver perceptions and purchase decisions for IFPs?
2. How do caregivers understand stage labelling on IFPs, including follow-on formula?
3. Why are caregivers choosing the wrong formula for their infant, despite age and stage labelling?

Seven additional studies were identified, of which two were from Australia. No studies were found from New Zealand. This document outlines the gaps identified in the IFP labelling literature review and summarises relevant findings.

## Methods

A systematic, targeted search of the literature was undertaken using the following methods:

- Reviewing research and citing studies of research included in the IFP labelling literature review.
- Searching six online databases for peer reviewed studies published between January 2003 and May 2022.
- Searching reference lists and citing studies of literature included in the evidence summary.
- Reviewing evidence raised by submitters to the P1028 first Call for Submissions.

The evidence summary included peer-reviewed articles published in academic journals, as well as grey literature. The online database search used two Boolean search strings for Research Question 1 and for Research Questions 2/3, which identified 69 and 116 studies respectively. Exclusion criteria was determined prior to the literature search commencing. Screening, data extraction and narrative evidence synthesis was undertaken by one officer, resulting in the inclusion of seven studies. This evidence was then integrated with relevant findings from four studies from the IFP labelling literature review. Further detail on methods can be found at [Appendix 1](#).

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<sup>2</sup> See FSANZ 2022, *P1028 First Call for Submissions - Attachment to SD3: Consumer research on infant formula labelling*. Available at: <https://www.foodstandards.gov.au/code/proposals/Documents/Attachment%201%20to%20SD3%20-%20Consumer%20research%20on%20infant%20formula%20labelling.pdf>

## **Research Question 1: Does toddler milk marketing on IFP labels (including follow-on formula labels) influence caregiver perceptions and purchase decisions for IFPs?**

Most manufacturers and importers of IFPs in Australia and New Zealand are restricted from advertising IFPs through voluntary agreements. Retailers are not part of these agreements, so consumers may see IFPs advertised in supermarket catalogues, for example. The agreements only cover infant formula and follow-on formula products. As such, toddler milk marketing occurs in Australia and New Zealand, including on infant and follow-on formula product labels. For example, statements such as 'contains 16 essential vitamins and minerals' appearing on infant formula labels, where the statement refers to a toddler milk that is marketed as being in the same product line.

### IFP Labelling Literature Review

The IFP labelling literature review identified several studies that evaluated the impact of toddler milk advertising on caregiver perceptions and purchase intentions for IFPs. These studies indicated that some caregivers who see advertisements for toddler milk believe they have seen advertisements for IFPs, or associate claims seen in toddler milk adverts with IFPs (Berry et al. 2010; Berry et al. 2012). This was particularly true when an advertisement was glanced at and not read carefully (Berry et al. 2010). However, no studies were found that investigated whether toddler milk marketing on infant formula or follow-on formula packaging influences perceptions of or purchase intentions towards IFPs.

### New Evidence

This evidence summary also did not identify any studies that specifically examined the effect of toddler milk marketing on infant formula or follow-on formula labels.

## **Research Question 2: How do caregivers understand stage labelling on IFPs, including follow-on formula?**

Stage labelling involves the labelling of infant formula, follow-on formula and toddler milk as stages in the same product line (e.g. Stage 1, Stage 2, Stage 3). This research question sought to investigate consumer understanding of stage labels, including whether stage labelling encourages caregivers to progress through the stages, and whether caregivers perceive nutritional benefits from progressing through the stages.

### IFP Labelling Literature Review

The IFP labelling literature review sought to understand caregivers' awareness of and understanding of stage labelling. One included qualitative study by Yockney and Comfort (2013) analysed the responses of 137 Australian and New Zealand caregivers to online discussion forums to assess how they differentiate between infant formula, follow-on formula and toddler milk. They found that caregivers perceive that children's nutritional needs vary by age and that different stages of formula are designed to meet these different needs. Providing the correct nutrient composition for their child's age was a key reason for moving to the next stage. The study found that caregivers differentiate between formula products based on age information (e.g. '0–6 months'), stage labelling (e.g. 'Stage 1'), and the product name (e.g. 'infant formula'). Of these three methods, 'age information' was considered the most useful and was often used in conjunction with stage labelling to identify the correct product when initially purchasing. When considering how caregivers make purchasing decisions, Yockney and Comfort (2013) found that caregivers tend to use the same brand to ensure consistency for their baby, and once they have found a brand their baby accepts, will aim to purchase that brand throughout the stages. While these findings suggest that caregivers may perceive nutritional benefit in progressing through the stages, it is unclear whether they perceive nutritional benefit in progressing through the stages, relative to non-formula sources of nutrition.

The IFP labelling literature review also reported the results of an online survey of a nationally representative sample of 501 Australian mothers of infants who had been formula fed between zero and 12 months, commissioned by the Infant Nutrition Council (Jigsaw 2015). This study found that 11% of mothers reported looking at age or stage labelling on IFP labels, when asked an open ended question about the information they had looked for on the label to help them make purchasing decisions. Eighty-one percent reported finding stage labelling useful when presented with a list of options. Thirty-five percent of the sample also reported that more information about when to transition to a new stage of formula would be helpful (Jigsaw 2015).

No studies found in the IFP labelling literature review directly tested consumer understanding of stage labelling - e.g. by presenting a label and seeking an interpretation of the stage element.

### New Evidence

This evidence summary identified two international studies that provided evidence towards this question.

One Italian study directly tested consumer understanding of stage labelling, in the context of a broader advertisement. In the 2015 study, Cattaneo and colleagues used a mixed methods approach to assess how advertisements for follow-on formula (for infants aged six –12 months) are presented to and understood by mothers. The first component of the study involved an analysis of advertisements in parenting magazines, which was followed by 80 in-depth interviews of pregnant women between 32 and 36 weeks gestation, and a survey of 562 mothers of children aged less than three years, from eight cities across Italy.

In the in-depth interviews, pregnant women were shown one of two real advertisements for follow-on formula, and were asked to identify at first glance the product they were being shown. The authors categorised the qualitative responses as: 33% identifying the product as 'formula', 31% as 'milk', 19% as a 'specific brand of milk', 5% as 'infant formula' and 12% as a 'generic breast milk substitute'. Only one of the 80 participants correctly identified the product as follow-on formula. When asked about their initial product identification during the interviews, women reported being misled by the numeral '2' (stage label), and the age of the infant portrayed in an image, which they had difficulty estimating. No information was provided on what else the advertisement contained. When asked specifically about the numeral '2', 65% of women were unable to assign it its proper meaning at first glance, which was defined by the study as 'from six months' or 'for the second phase of growth'. Other interpretations at first glance included: 'added value', 'two cups', 'better than one', 'for two month old babies' or 'for two year old babies' (see Table 1). Interpretation improved somewhat after careful reading of the advertisement, with 62% able to correctly interpret the numeral 2. However, 'two cups', 'better than one' and 'added value' remained as interpretations after careful reading, with 11% also expressing other incorrect interpretations.

Table 1: Interpretations of 80 pregnant Italian women of stage label numeral '2' in two follow-on formula advertisements (Cattaneo et al. 2015).

Meaning of Numeral 2	After first glance (%)	After careful reading (%)
<b>Correct interpretations</b>	<b>35</b>	<b>62</b>
From six months	0	43
For the second phase of growth	35	19
<b>Incorrect Interpretations</b>	<b>65</b>	<b>38</b>
Added value (e.g. more iron)	9	4
Two cups	8	14
Better than one	8	9
Two month old babies	5	0
Two year old babies	1	0
Don't know	13	0
Other	21	11

It is important to highlight that potential differences in infant nutrition literacy, culture, regulatory environments and exposure to IFP advertising may mean that similar results would not have been obtained in the Australian and New Zealand context. For example, the study examined stage labelling in the context of follow-on formula advertisements. Such advertisements are not permitted under voluntary codes in Australia and New Zealand and it is unclear whether similar results would have been obtained from purely examining the label. The advertisements used also contained images of infants, which are not permitted on labels in Australia and New Zealand. It is also unclear whether any age information was presented in the advertisements. While the women were specifically asked about the numeral '2', the study design did not allow the influence of the infant, or other elements of the advertisement, to be separated from the influence of the stage label on women's overall interpretation of the product. The in-depth interviews from which these findings were drawn also utilised pregnant women, which likely included some first time mothers who may not yet have had exposure to IFPs. While it is possible that familiarity with stage labelling through exposure to IFPs would reduce incorrect interpretations, the tendency to stick with a formula product once it is accepted by an infant may mean that initial interpretations could lead to incorrect purchasing habits that persist over time (Yockney & Comfort 2013). The proportion of the sample who were first time mothers was not provided, and the findings on stage label interpretations were not followed up in the survey of infant mothers. Noting these limitations, Cattaneo et al. (2015) provides some evidence that the meaning of stage labelling is not always well understood by pregnant women, particularly at first glance.

A mixed-method study undertaken by M&C Saatchi World Services on behalf of the World Health Organisation (WHO) and the United Nations Children's Fund (UNICEF) provides some insight into how stage labelling is understood by caregivers and health professionals. The study investigated the impact of marketing on infant feeding attitudes and behaviours in the United Kingdom, China, Bangladesh, South Africa, Nigeria, Morocco and Mexico. The study involved a desk review and marketing analysis within each country, as well as primary research with pregnant women, mothers of children aged 0-18 months, health professionals, partners, family and friends. Qualitative primary research included 141 phone diaries, 91 focus groups and 70 in-depth interviews with pregnant women and mothers, as well as 302 interviews with health professionals and 22 focus groups with partners, family and friends. 10 in-depth interviews with marketing executives and three focus groups with Yuesasos (full time child minders) also occurred in China. Quantitative research involved face-to-face surveys with 8,258 pregnant women and mothers, with approximately 1,050 participants from each country.



Drawing from the marketing analyses, phone diaries, interviews and surveys with women, and interviews with health professionals and marketing executives, the study identified how stage labelling was used to differentiate product options. The study reported that offering stages of formula products was “designed to normalize the feeding of formula milk beyond infancy and early childhood”, with the numbered stages indicating that the products are “a set and to imply that they should be used in order” (M&C Saatchi 2022, pg. 21). In countries such as China and Vietnam, caregivers and health professionals often believed that the quality of breast milk declined after the age of six months. Therefore “moving on to stages 2-4 is a natural next step” (M&C Saatchi 2022, pg.50), with marketing suggesting that those products can improve growth and development, or have added nutrition, relative to breast or cow’s milk. For example, one Vietnamese mother indicated “Stage 3 and 4 focus most on providing calcium, which helps the child gaining height and strengthens his/her bones and well as his/her brain a lot” (M&C Saatchi 2022, pg. 50). Another mother from the United Kingdom noted, “If you look at ... Stage 2 and Stage 3 ... it’s, kind of, ‘Let’s continue your journey. Let’s help you.’... I felt like... the formula milk is a good thing because it will support your child’s growth later on as they’re growing... So, I feel like I was tricked into follow-on formula, to be honest” (M&C Saatchi 2022, pg. 52). However, the study also identified that messaging from United Kingdom health professionals that Stages 2-4 are not required was reducing the perception that later stage formulas were needed. Overall, these findings suggest that in some countries, stage labels and the marketing surrounding them may be encouraging parents to view later stage products as necessary for their child’s development and nutrition. However, the study also highlights that these understandings differ across different countries, particularly where health advice differs. This, along with differences in infant nutrition literacy, culture, regulatory environments and exposure to IFP advertising mean that this study may not be generalisable to the Australian and New Zealand context.

### Summary

In combination with findings from the IFP labelling literature review, these results suggest that while stage labelling may be used by some caregivers to differentiate between formula products, age labelling (‘suitable for ages....’) is important to guide that understanding, with the information often used together when making initial purchase decisions. The meaning of stage labelling was not always well understood by Italian pregnant women, particularly when viewed briefly. Some incorrect interpretations of stage labels may lead to confusion about the appropriate product for a child’s age (e.g. ‘for two month olds’), or appropriate formula preparation and servings (e.g. ‘two cups’). International research also identified that in some countries, stage labelling may encourage caregivers to continue formula feeding beyond infancy and early childhood, sometimes as an alternative to breast milk. However, this effect may be reduced with messaging from health professionals that later stage formulas products are not required. Australian and New Zealand findings suggest that caregivers understand that each stage has a specific nutrient composition designed to meet the nutritional needs of children at certain ages, and that appropriate nutrition is a key motivator for moving to the next stage. They also identified that caregivers are likely to follow the same brand through the stages. However, it is not clear the extent to which stage labelling influences these perceptions and behaviours, relative to other information sources and labelling elements. It is also unclear whether caregivers perceive nutritional benefit in progressing through the stages, relative to non-formula sources of nutrition.

### **Research Question 3: Why are caregivers choosing the wrong formula for their infant, despite age and stage labelling?**

This research question sought to further explore a finding from the IFP labelling literature review, that some caregivers may be providing the incorrect formula product for their child’s age.

## IFP Labelling Literature Review

The IFP labelling literature review highlighted that some caregivers are choosing inappropriate IFPs for their child's age. In a nationally representative online survey of 501 Australian mothers of infants who had been formula fed (Jigsaw 2015), 35% of those who introduced formula within six months of birth (n=450) started with follow-on formula, which is intended for children between 6-12 months. These mothers were less likely to have sought advice from a health care provider about the provision of IFPs. Yockney and Comfort's (2013) qualitative analysis of online discussion forums also identified that some Australian and New Zealand caregivers continue to use a formula stage beyond the age range specified, with some caregivers delaying the transition to avoid digestive upsets or palatability changes. Caregivers in this study also reported that packaging can look similar across a product range and that age information is important to minimise the risk of using an incorrect stage.

## New Evidence

This evidence summary identified two studies that provided further evidence on the prevalence of this issue in Australia. No evidence was found from New Zealand. Additionally, four studies (including two separate analyses of the same study), provide some insight into the scale of the problem internationally, and potential reasons behind it. No studies were found that directly asked caregivers why they chose inappropriate formulas.

### *How many caregivers are choosing the wrong formula?*

In contrast to the results of Jigsaw (2015), the 2021 Australian Feeding and Toddlers Study (OzFITS) found that few Australian parents were providing incorrect formula types (Moumin et al. 2022). In a cross-sectional phone survey of parents with children aged zero-24 months, Moumin and colleagues asked parents of children who had commenced complementary foods or formula feeding (n = 976) to record what their child ate in the previous 24 hours. The study found that no infants aged zero-5.9 months consumed follow-on formula, toddler milk, cow's milk or cow's milk alternatives (e.g. nut or cereal based milks) (see Table 2). Similarly, no infants aged six-11.9 months were served toddler milk, cow's milk or cow's milk alternatives. Few toddlers aged 12-24 months continued to be served infant formula (2.9%) and follow-on formula (2.1%), while toddler milk provision became more common at this age (13.5%). These results suggest that Australian caregivers typically understand which formula type is appropriate for their child's age. They also align with the findings of Yockney and Comfort (2013) that some parents may delay transition away from formula, although this was not common. The study systematically reviewed food records with parents, including checking the specific brand and product served, reducing the likelihood that parental confusion about the formula they were serving influenced results. However, the study only looked at milk product consumption over a 24 hour window and did not explore what products may have been served on other days. Study participants were also recruited via online advertising, resulting in a convenience sample that were primarily female (97.5%) and more likely to be university educated (75.5%), married or in a de facto relationship (94.1%), and have a household income >\$100,000 per year (61.0%) than the Australian population. Thus, the results may not be generalisable to the broader Australian population, particularly single parent households or those with lower education or income levels.

Table 2: Milk type consumption of Australian children aged 0-24 months over 24-hour period (Moumin et al. 2022)

Milk Feeding Type	0-5.9 months (n=92)	6-11.9 months (n=286)	12-24 months (n=475)
Breast milk	65 (70.7%)	221 (77.3%)	210 (44.2%)
Infant formula	76 (82.6%)	39 (13.6%)	14 (2.9%)
Follow-on formula	-	59 (20.6%)	10 (2.1%)
Toddler milk	-	-	64 (13.5%)
Cow's milk	-	-	165 (34.7%)
Cow's milk alternative	-	-	18 (3.8%)

A longitudinal survey of 333 Australian mothers of infants aged up to nine months old also found that the majority of the sample were feeding their infants age appropriate formulas (Appleton 2020). Mothers were surveyed upon enrolment, when their child was less than three months old, and at approximately six and nine months of age. At each stage, mothers who were serving formula were asked which brand and product they were regularly providing to their infant. These products were then coded as either Stage 1 or Stage 2 by the authors. No information was reported about toddler milk consumption. Results showed that all formula fed infants less than three months old (n=94) were using a Stage 1 formula. When the infants were six months old, the majority of those receiving formula (n=106) were still fed Stage 1 (64.2%), with 28.3% receiving Stage 2, and 7.5% being fed a 'speciality formula'. At nine months, the majority of infants receiving formula (n=132) were consuming Stage 2 formula (59.1%), with 35.6% receiving Stage 1 formula and 5.3% receiving a 'speciality formula'. At nine months old, those providing both breast milk and infant formula were significantly more likely to be providing Stage 2 formula (85.7%), than those only providing formula (55.7%) (p=0.009). As Stage 2 formula can be introduced from six months of age, this study suggests that infants are not being fed Stage 2 formula too early. This contrasts with the findings of Jigsaw (2015), noting that the exact timeframe of transition from Stage 1 to Stage 2 was not collected. It also suggests that mothers using mixed feeding may be moving to or starting with Stage 2 formula earlier than those only feeding formula. However, the relatively small number of participants in the study were recruited via social media, resulting in a convenience sample that was more highly educated (50.2% university educated or higher), and less likely to be born overseas (10.0%) than the broader Australian population. As respondents self-selected to participate, their practices may also differ systematically from the broader population. The 60 participants who were lost to follow up also differed statistically from those who completed the study in terms of the number of children, and the mothers level of education (p < 0.05). As such, the results may not be generalisable to the broader Australian population.

Table 3: Formula types provided by 333 Australian mothers to infants aged 0-9 months (Appleton 2020)

Milk Feeding Type	< 3 months (receiving formula=94)	6 months (receiving formula=106)	9 months (receiving formula=132)
Stage 1	100%	64.2%	35.6%
Stage 2	-	28.3%	59.1%
Specialty Formula	-	7.5%	5.3%

Two papers reported on a 2017 study in the US, which aimed to measure milk type provision to children under three years, and assess caregiver confusion about the difference between

infant formula (including follow-on formula) and toddler milks (Romo-Palafox et al. 2020; Romo-Palafox & Harris 2021). In the online survey, 1,645 caregivers of infants (6-11 months) and toddlers (12-36 months) identified all of the milk products they served to their child in the last month, and which product they served most often. To account for potential confusion between milk product types, the selection of products served was undertaken in stages. First, caregivers identified the product categories they served from 'infant formula', 'other formulas or powdered milk', 'regular milk', 'non-dairy milk', 'other' or 'none of the above' (which included exclusive breastfeeding). If caregivers chose 'infant formula' or 'other formulas or powdered milk' they were asked to identify the brand and the product they served most often in the last month from lists of infant formula and toddler milk products. In line with US regulations, the study did not distinguish between infant formula and follow-on formula. 'Other formulas or powdered milk' referred to toddler milk and growing up milks, in recognition that there is no broadly accepted terminology in the US. The term 'toddler milk' is used in the analysis below for simplicity.

While approximately two thirds of caregivers reported serving milk types recommended for their child's age (including breast milk and infant formula for infants 6-11 months and cow's milk for toddlers 12-36 months) a significant proportion served non-recommended milk types (see Table 4). The study also identified that those who regularly served inappropriate milk types for their child's age often served them daily. Differences in the total sample size analysed across Romo-Palafox et al. 2020 (n=1,645) and Romo-Palafox & Harris 2021 (n=1,607) have resulted in slight variations across the two studies. It is unclear why some participants were excluded from the latter report. The analysis below highlights which paper the figures are drawn from, and any major differences in the same statistic where it is reported across both papers.

#### 6-11 month olds

22% of infants aged 6-11 months had been incorrectly served toddler milk in the last month, with 11%<sup>3</sup> of caregivers serving this milk product most often. 53% of the 11% serving toddler milk most often (6% of all 6-11 month olds) had initially only chosen 'infant formula' when asked what categories of milk product they served, indicating that they may have believed the toddler milk product they served was infant formula (Romo-Palafox et al. 2020).

Of the 54 infants aged 6-11 months who were served toddler milk most often, 69% consumed it daily, 20% weekly, and 11% monthly (Romo-Palafox & Harris 2021).

While this regular provision of toddler milk to infants is concerning, Romo-Palafox and Harris (2021) also found that 18% of 6-11 month olds were served both toddler milk and infant formula, indicating that all but 4% of those receiving toddler milk were also receiving some infant formula with more appropriate nutrition for their age. The common provision of both products may suggest that infant formulas and toddler milks are not necessarily seen as substitute products, or could indicate confusion between the product types.

Of the non-recommended milk types served to 6-11 month olds in the last month, toddler milk was the most common (22%), above cow's milk (20%) and plant milk (7%). The 22% of 6-11 month olds being served toddler milks was lower than the 78%<sup>4</sup> of children of this age who were served infant formula, but was similar to the proportion who were exclusively breast fed (20%) (Romo-Palafox & Harris 2021).

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<sup>3</sup> Reported as 10% in Romo-Palafox & Harris (2021)

<sup>4</sup> Romo-Palafox et al. 2020 reports that 75% of 6-11 month olds consumed infant formula in the last month. Romo-Palafox & Harris 2021 reports the number of 6-11 month olds numbers consuming 'infant formula alone', 'infant formula + breast milk', 'infant formula + toddler milk', and 'infant formula + cow's milk + toddler milk' in the last month. It is assumed that all categories are mutually exclusive, except 'infant formula + cow's milk + toddler milk' which may double count earlier categories, providing a total of 78% consuming infant formula.

### 12 month olds

No milk products were considered inappropriate for 12 month olds, in recognition that this is a period of transition in milk product consumption. However, Romo-Palafox and colleagues noted that toddler milk is not recommended by health professionals at any age, as it is often high in added sugars and contains no unique nutritional value.

The provision of infant formula was less common in 12 month olds relative to 6-11 month olds (65% vs 78%). However toddler milk provision was higher relative to 6-11 month olds (33% vs. 22%). 20% of caregivers of 12 month olds served both infant formula and toddler milk.

During this period of transition, the provision of cow's milk also rose by 27% to 47%, while plant milk increased by 4% to 11% relative to 6-11 month olds. The proportion of 12 month olds who were breastfed was not reported.

### 13-36 month olds

In an initial analysis which did not isolate 12 month olds, Romo-Palafox et al. (2020) identified that 50% of toddlers aged 12-36 months had been served infant formula in the last month, with 39% of caregivers serving this milk type most often. The proportion of caregivers serving infant formula most often was also 39% for 13-36 month olds, indicating that infants in transition did not significantly skew the result (Romo-Palafox & Harris 2021).

Seventy-eight percent of the 39% of 12-36 month olds serving infant formula most often had correctly categorised the product they had served as infant formula, indicating that the majority of caregivers in this age group were not confused about the product type they were providing. This suggests that many caregivers are delaying transition or failing to transition away from infant formula. However the remaining 22% of caregivers of 12-36 month olds who served infant formula most often (9% of all 12-36 month olds) incorrectly categorised the infant formula they served most often as toddler milk, indicating that confusion between products may continue in older age groups (Romo-Palafox et al. 2020).

Of the 213 toddlers aged 13-23 months and the 182 aged 24-36 months who were served infant formula most often, 54% and 47% consumed it daily respectively, compared with 22% and 24% weekly and 25% and 29% monthly (Romo-Palafox & Harris 2021).

For younger toddlers aged 13-23 months, infant formula provision was lower relative to those aged 12 months (57% vs 65%), yet still remained more common than toddler milk which saw increased provision relative to 12 month olds (45% vs 33%). 24% of 13-23 month olds were served both infant formula and toddler milk (Romo-Palafox & Harris 2021).

Infant formula provision continued to decline in older toddlers aged 24-36 months relative to younger toddlers aged 13-23 months (43% vs 57%), but still remained slightly more common than toddler milk (41%). 21% of 24-36 month olds were served both toddler milk and infant formula, further supporting the idea that the products are not necessarily viewed as substitutes by all caregivers (Romo-Palafox & Harris 2021).

Table 4: Provision of infant formula and toddler milk to infants and toddlers in the US (Romo-Palafox & Harris 2021).

Age Group	Milk Products	% served in the past month	% served as most common milk product
Infants: 6-11m (n=544)	Infant formula*	78	60
	Toddler milk	22	10 <sup>5</sup>
	Infant formula* and toddler milk	18	-
Infants: 12m (n=55)	Infant formula*	65	53
	Toddler milk	33	16
	Infant formula* and toddler milk	20	-
Toddlers: 13-23m (n=490)	Infant formula*	57	43
	Toddler milk	45	23
	Infant formula* and toddler milk	24	-
Toddlers: 24-36m (n=518)	Infant formula*	43	35
	Toddler milk	41	21
	Infant formula* and toddler milk	21	-
Total: 6-36m (n=1,607)	Infant formula*	62	47
	Toddler milk	36	18
	Infant formula* and toddler milk	18	-

\*Infant formula, including follow-on formula

This study suggests that a substantial proportion (22%-57%) of caregivers who provide formula in the US may be providing the incorrect formula type for their child's age. While this study drew on a large random sample in the US, supplemented to provide appropriate coverage of different ethnic groups, differences in infant nutrition literacy, culture, regulatory environments, and exposure to IFP advertising may mean that these results are not generalisable to Australia and New Zealand.

#### Why are caregivers choosing the wrong formula?

The proportion of US caregivers who continue to regularly serve their toddlers (12-36 months) infant formula (35%-53%) aligns with the findings of Yockney and Comfort (2013) that there is variation in the time when caregivers transition between formula stages, or away from formula (Romo-Palafox & Harris 2021). This delayed transition (or failure to transition) may be contributing to incorrect infant formula provision in toddlers, which was also seen to a small degree (2.1%-2.9%) in Australia (Moumin et al. 2022). However it does not account for the early provision of follow-on formula to Australian infants less than 6 months old (Jigsaw, 2015) or the provision of toddler milk to US infants aged 6-11 months (Romo-Palafox & Harris 2021).

The proportion of US caregivers (6% of 6-11 month olds and 9% of 12-36 month olds) misidentifying the milk product category that they served most often also suggests that confusion between products may be driving incorrect formula choices (Romo-Palafox & Harris 2021). These proportions may have been higher if all products served were included, rather than just the product served most often. Romo-Palafox and colleagues speculate that this confusion may be due to similar branding and labelling of infant formula and toddler milks. However, this was not explored in their study.

<sup>5</sup> Reported as 11% in Romo-Palafox et al (2020)

A series of focus groups conducted in low to moderate income neighbourhoods in Hartford and Washington in the US provide some insight into how labelling practices may be contributing to consumer confusion. Fleming-Milici et al. (2022) conducted nine focus groups with 50 parents of children aged 9–36 months, who made feeding decisions for their child. Participants were reported to have diverse racial and ethnic backgrounds, although specific demographic information was not collected. In the semi-structured focus groups, participants were asked for their views in response to ‘concept sheets’ which provided factual information about sweetened fruit flavoured drinks and toddler milks. Participants independently raised that they were confused by the difference between infant formulas and toddler milks. Participants commonly referred to toddler milks as ‘toddler formulas’ or a specific brand name followed by the term ‘formula’. One participant noted she was “led to believe toddler formulas were the equivalent of infant formula” (Fleming-Micili et al. 2022, p. 6), with another specifying that they thought that toddler milk labelling was “very misleading”, as “I thought that, other than the name change from infant to toddler, it was the same product maybe with slightly different ratios of vitamins for what a toddler needs versus what an infant needs” (Fleming-Micili et al. 2022, p. 6). Fleming-Milici and colleagues hypothesised that this may be due, in part, to the lack of a consistent statement of identity for toddler milk in the US. Participants also independently raised that similar packaging and product extensions contribute to the confusion between infant formula and toddler milk, and fosters trust in the toddler milk products of specific brands. For example, they discussed how toddler milk packaging “looks just like formula canisters” for brands that “parents trust already” (Fleming-Micili et al. 2022, p. 5). Finally, participants raised that the cheaper price of toddler milk may encourage some parents to switch from infant formula to toddler milks earlier than recommended, and to provide toddler milk to their older children. For example, one participant said that “if you’re on a budget, I don’t know if parents are switching to this [toddler milk] earlier and you’re thinking ‘oh it’s the same company’... I think from a marketing standpoint there’s probably a strategy there” (Fleming-Micili et al. 2022, p. 7). Another parent noted “to make the next step [toddler milks] a little bit cheaper probably plays into the consumer psychology” (Fleming-Micili et al. 2022, p. 7). Participants also raised that marketing connections between infant formula and toddler milk makes it seem like a “natural” or “necessary next step” to infant formula (Fleming-Micili et al. 2022, p. 5). This suggests that a lack of a consistent statement of identity, similar branding and packaging, and lower price points of toddler milk relative to IFPs may be contributing to incorrect formula provision in the US.

A multi-country, mixed-method study undertaken by M&C Saatchi World Services on behalf of the WHO and UNICEF also provides some insight into why caregivers may be providing incorrect formulas (see Research Question 2 for study detail). Drawing from marketing analyses, phone diaries, interviews and surveys with women, and interviews with health professionals and marketing executives, the study identified that similarities in product labels, shelf locations in stores, the use of the same brands across IFPs and toddler milks, and inconsistencies in recommended age ranges can lead caregivers to purchase the wrong milk product. Mothers reported being confused by the similar labels and noted it was sometimes not clear which age group formulas were intended for. For example, one mother from the UK noted, “I saw these [formula milks] on [website for a store] and they all seemed to be...a more grown-up or follow-on milk. But, I found it all a bit confusing because I can’t really say that - I couldn’t tell from the packaging immediately what the different types of milk were for.” (M&C Saatchi 2022, pg. 21) As discussed in Research Question 2, this study may not be generalisable to the Australian and New Zealand context.

### Summary

Overall, the findings from this evidence summary differed from the results of Jigsaw (2015), which suggested that some Australian mothers may be incorrectly providing follow-on formula to infants less than six months old. Instead, the majority of Australian caregivers studied appear to be feeding their infants age appropriate formulas, with only a small

proportion (2.1%-2.9%) continuing to serve IFPs to children aged over 12 months. These differences may be explained by the non-representative samples used in Moumin et al. (2022) and Appleton (2020), relative to the nationally representative sample used by Jigsaw (2015). As such, it is possible that incorrect formula provision is occurring in subgroups of the population that were not well represented in those studies, including single parent households, those with lower education or income levels, and those born overseas. No research was identified that explored the prevalence of this issue in New Zealand, or the reasons behind it in either Australia or New Zealand.

Incorrect formula provision does appear to occur in the US. One study found that 22% of 6-11 month olds consumed toddler milk in the last month, with 10-11% consuming it as their most common milk product, and 7% consuming it daily (Romo-Palafox et al. 2020; Romo-Palafox & Harris 2021). This is a serious concern, as toddler milk does not contain appropriate nutrition for infants of this age. However, 18% of 6-11 month olds in the study received both infant formula and toddler milk in the last month, leaving just 4% receiving toddler milk without infant formula. Romo-Palafox and colleagues also found that 50% toddlers aged 13-36 months consumed infant formula in the past month, with 39% consuming it as their most common milk product and 20% consuming it daily. The substantial proportion (18-24%) of US caregivers providing both infant formula (including follow-on formula) and toddler milk to their child, may indicate that they are not always be seen as substitute products, or that consumers may be confused about the distinction between the products.

Consumer confusion between IFPs and toddler milks may be contributing to incorrect formula provision internationally. Caregivers reported being confused between IFPs and toddler milks and noted it was sometimes not clear which age group formulas were intended for. This confusion was linked to similar branding, packaging and shelf locations in stores, line extensions and no consistent statement of identity or recommended ages for IFPs or toddler milks. The proportion of US caregivers (6% of 6-11 month olds and 9% of 12-36 month olds) misidentifying the milk product category that they served most often also suggests that confusion between infant formula and toddler milk may be driving incorrect formula choices (Romo-Palafox & Harris 2021). This aligns with findings from Yockney and Comfort (2013) that Australian and New Zealand caregivers sometimes need to rely on age labelling to minimise the risk of using an incorrect stage due to similar packaging across the same product line.

Variation in the age at which caregivers transition children between formula stages, or away from infant formula, may also be driving incorrect formula provision to older infants. As highlighted in Australian research by Yockney and Comfort (2013), transitions may be delayed to avoid digestive upsets or palatability changes.

Caregivers also raised that lower price points for toddler milk relative to IFPs may contribute to incorrect formula provision, if they do not understand the different nutrient compositions.

It is important to note that factors highlighted in international research may not be contributing to confusion in the Australian and New Zealand context. As 'infant formula' and 'follow-on formula' are prescribed names under the Australia New Zealand Food Standards Code (the Code), inconsistent statements of identify or recommended ages are unlikely to be contributing to confusion locally. Similarly, the Code requires the following statements to be on IFP labels, to indicate what product is appropriate for a child's age:

- For infant formula — the IFP may be used from birth; and
- For follow-on formula — the IFP should not be used for infants aged under the age of 6 months; and
- It is recommended that infants from the age of 6 months should be offered foods in addition to the IFP.



However, a label survey undertaken by FSANZ to inform P1028 has identified similarities in branding and packaging within the same formula product lines (see Attachment 2 to SD3). This, along with shelf location, delayed transition and price could potentially be relevant to the Australia and New Zealand context. Australian women were also more likely to provide follow-on formula to infants less than 6 months old if they had not sought medical advice from a health care provider.

## **Conclusion**

This rapid systematic evidence summary examined social science literature from January 2003 to May 2022 on three evidence gaps identified by a previous FSANZ literature review of consumer research on IFP labelling. The research questions included:

1. Does toddler milk marketing on IFP labels (including follow-on formula labels) influence caregiver perceptions and purchase decisions for IFPs?
2. How do caregivers understand stage labelling on IFPs, including follow-on formula?
3. Why are caregivers choosing the wrong formula for their infant, despite age and stage labelling?

Seven additional studies were identified, of which two were from Australia. No studies were found from New Zealand. Key findings from the IFP labelling literature review and this evidence summary are summarised below. As described throughout, the results from international studies may not be generalisable to Australia and New Zealand, due to potential differences in infant nutrition literacy and exposure to IFP advertising, as well as differences in cultural or regulatory environments.

### Key findings:

- Stage labelling on IFPs (Stage 1,2,3) may be used by some caregivers to differentiate between formula products. However age labelling ('suitable for ages...') is important to guide that understanding, with the information often used together when making initial purchase decisions.
- Australian and New Zealand caregivers generally understand that each formula stage has a specific nutrient composition designed to meet the needs of children of a certain age. Ensuring that children get the correct nutrient composition for their age was a key reason for moving to the next stage. Once caregivers have found a brand that their infant accepts, they will generally remain with that brand throughout the stages to provide consistency. However, it is not clear the extent to which stage labelling influences these perceptions and behaviours relative to other information sources and labelling elements.
- Stage labels are not always well understood. When asked to interpret a stage label (numeral '2') as part of follow-on formula advertisements, 65% of a sample of pregnant Italian women were unable to correctly interpret it's meaning at first glance. Incorrect interpretations remained relatively common (38%) after careful reading of the advertisements.
- Some incorrect interpretations of stage labels may lead to confusion about the appropriate product for a child's age (e.g. 'for two month olds'), or appropriate formula preparation and servings (e.g. 'two cups').
- In some countries, stage labelling and related marketing may encourage caregivers to continue formula feeding beyond infancy and early childhood. This effect may be reduced with messaging from health professionals that later stage products are not required.

- There is some evidence that a subset of children in Australia and the US are receiving the incorrect formula type for their age. In two studies of Australian caregivers, infants were typically served the correct formula type for their age. However, one Australian study found that 35% of surveyed mothers who introduced formula within 6 months of birth started with follow-on formula, which is intended for children between 6–12 months. In one US study, 22% of 6-11 month olds consumed toddler milk in the last month, with 10-11% consuming it as their most common milk product and 7% consuming it daily. In addition, 50% toddlers aged 13-36 months consumed infant formula in the past month, with 39% consuming it as their most common milk product and 20% consuming it daily.
- In the US, a substantial proportion (18-24%) of caregivers provided both infant formula and toddler milk to their child. This suggests that they may not always be perceived as substitute products, or that consumers are confused about the distinction between the products. Most infants aged 6-11 months who were served toddler milk were also served infant formula, with just 4% of the 22% who consumed toddler milk not consuming any infant formula.
- Factors potentially contributing to confusion about the most appropriate IFP for a child's age internationally include similar branding, packaging and shelf locations in stores, line extensions and no consistent statement of identity or recommended ages for IFPs or toddler milks.
- Some of these factors may not contribute to confusion in the Australian and New Zealand market, due to prescribed names and requirements for age information on IFP labels under the Code. However similar branding and packaging, line extensions and shelf locations may be relevant to Australia and New Zealand, with some caregivers reporting using age labelling to minimise the risk of buying an incorrect stage were packaging is similar across a product line.
- In the US there is substantial variation in the age at which caregivers transition children between formula stages, or away from formula. Transitions may be delayed to avoid digestive upsets or palatability changes. Delayed transition was less common in Australia, however 35% percent of a sample of Australian women sought more information about when to transition to a new stage.
- US caregivers also raised that the lower price of toddler milks relative to IFPs may encourage their provision to younger infants if caregivers do not understand the different nutrient compositions.

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<https://www.mpi.govt.nz/dmsdocument/4107-understanding-caregivers-perceptions-and-use-of-follow-up-formula-and-toddler-milks-innew-zealand-and-australia>.

## Appendix 1 – Methodology

### Searching

A systematic, targeted search of the literature was undertaken in May 2022 using the following methods:

- Reviewing research and citing studies of research included in the IFP labelling literature review.
- Searching six online databases for peer reviewed studies published between January 2003 and May 2022.
- Searching reference lists and citing studies of literature included in the evidence summary.
- Reviewing evidence raised by submitters to the P1028 first Call for Submissions.

Online database searching included six online databases accessed via EBSCO Discovery (available through the FSANZ library):

- Science Direct
- Food Science Source
- FSTA - Food Science and Technology Abstracts
- MEDLINE with Full Text
- SocINDEX with Full Text
- EconLit with Full Text

Online database searches were undertaken using two Boolean search term combinations, one for Research Question 1, and one for Research Questions 2 and 3. Searches were limited to peer-reviewed papers available in English and published from 2003 to 2022. 2003 was chosen as the lower limit for searches to align with the IFP labelling literature review.

Search string Research Question 1:

("Infant formula\*" OR "follow on formula\*" OR "baby formula\*") AND ("Toddler milk\*" OR "toddler formula\*" OR "toddler drink\*" OR "growing up milk\*") AND (Advert\* OR market\* OR claim\* OR proxy OR promot\* OR confla\* OR stage label\* OR age\* OR label\* OR line market\* OR packag\* OR caregiver OR perception\* OR understand\* OR knowledge\* OR behav\* OR react\* OR purchas\* OR intent\* OR buy\* OR shop\*)

Search string Research Question 2/3<sup>6</sup>:

TI ("infant formula\*" OR "baby formula\*" OR "follow on formula\*" OR "toddler milk\*" OR "toddler formula\*" OR "growing up milk\*") AND AB (label\* OR market\* OR advert\* OR promot\*) AND AB (stage\* OR line OR proxy OR number\* OR age OR "cross promotion")

### Screening

Screening was undertaken by one officer using EPPI Reviewer. Exclusion criteria was determined prior to the literature search commencing. Search string 1 identified 77 potential documents after duplicates were removed by EBSCO, which was reduced to 69 with further duplicates removed by EPPI reviewer. Search string two identified 140 potential documents after duplicates were removed by EBSCO, which was reduced to 116 with further duplicates removed by EPPI Reviewer.

The exclusion criteria for each research question included:

Research Question 1:

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<sup>6</sup> 'TI' indicates that the terms must be in the title of the study. 'AB' indicates that the terms must be in the abstract of the study.

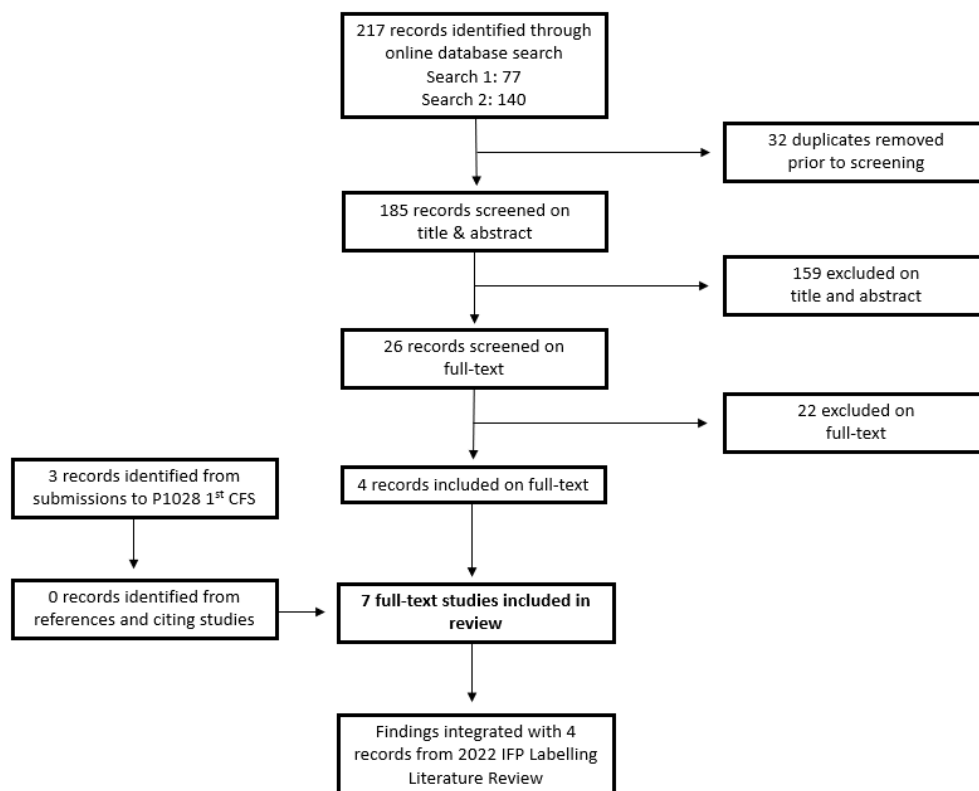
- Clinical studies – e.g. on the effect of infant formula ingredients on outcomes
- Infant formula, follow on formula or toddler milk use
- Effect of infant formula and follow on formula marketing
- Effect of off pack toddler milk marketing
- Effect of toddler milk labelling on toddler milk understanding/behaviours.

Research Question 2:

- Clinical studies – e.g. on the effect of infant formula ingredients on outcomes
- Infant formula, follow on formula or toddler milk use
- Effect of off pack marketing
- Effect of 'non stage label'/ line marketing/ cross promotion label elements – e.g. NIP, ingredients lists, health and nutrition claims.

Papers were first screened on title and abstract, before being screened on full text. This resulted in the inclusion of four full text documents. Three further documents were identified by reviewing submissions made to the P1028 first Call for Submissions. No additional studies were identified in citing studies of research from the IFP labelling literature review, or from the reference lists and citing studies of literature included in this evidence summary. Figure A1 shows the number of documents retrieved at various stages of the review process.

Figure A1: Number of documents retrieved at various stages of the review process.



Data Extraction and Synthesis

Data extraction and a narrative synthesis were undertaken by one officer. This involved summarising the gaps in the literature and any relevant evidence for each research question identified by the IFP labelling literature review. This was then integrated with newly identified literature. Peer review was undertaken by two FSANZ social scientists.