

## Supporting document 2

# Rapid evidence assessment on consumer knowledge, attitudes and behaviours relating to dietary fibre

## Labelling Review Recommendation 14

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### Executive Summary

FSANZ has undertaken a rapid evidence assessment (REA) to determine Australian and New Zealanders' knowledge, attitudes and behaviours relating to the expression of dietary fibre in the Nutrition Information Panel (NIP). The findings of this process are outlined below against the research questions that have been investigated.

*When do consumers seek out dietary fibre content information?*

Dietary fibre information in the Nutrition Information Panel (NIP) may be useful in specific circumstances, which includes consumer perceptions that the food is a source of dietary fibre, and in those instances when selecting a food for the first time. However dietary fibre information may not be important for some foods that consumers do not associate with dietary fibre.

*Who uses information about dietary fibre in the NIP?*

Up to 39% of consumers appear to use dietary fibre information that is provided in the NIP (or an overseas NIP equivalent), although this prevalence may be an overestimate because it is derived from self-reported data. Users of the information are more likely to be female, have higher incomes, or be on a diet.

*How well do consumers understand dietary fibre information?*

Consumers generally understand that they should consume more dietary fibre, although there are some specific groups of consumers who do not have this understanding. The level of understanding in respect to dietary fibre content appears to differ across food types, with the dietary fibre content of bread being well understood. Some Australian and New Zealand consumers may be less informed about the importance of dietary fibre.

Factors that appear to influence the ability of consumers to understand fibre information include context and format of the information. Specifically, some consumers may not be able to accurately interpret fibre g/100g values, and do not always understand which foods are higher or lower in dietary fibre.

*How is NIP fibre information used in purchase and consumption decisions?*

The self-reported influence of dietary fibre information in the NIP appears to be larger than actual influence, although there is evidence that consumers value dietary fibre positively. The evidence also shows that reading the NIP (or the overseas NIP equivalent) correlates with higher dietary fibre intakes.

*What are the consumer preferences for how the nutrient dietary fibre is expressed?*

No research was located on this question. It is not known whether consumers would prefer information on "fibre", "dietary fibre", or some other variant.

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# 1. Introduction

The purpose of this rapid evidence assessment (REA) is to provide a concise statement of Australian and New Zealanders' knowledge, attitudes and behaviours relating to the expression of dietary fibre in the Nutrition Information Panel (NIP). A REA is a systematic and rigorous approach to reviewing the evidence concerning a specific research question. The 'rapid' adjective of the REA is achieved largely through constraining the focus of the assessment so that search, retrieval, filtering, review and critique of literature takes place within a narrow and well-defined scope. (Government Social Research Service 2014). This REA forms part of the evidence base that informs the FSANZ response to the wider Recommendation 14 project objective of determining whether mandating total dietary fibre content in the NIP can provide meaningful information on dietary fibre, and whether it can influence food purchasing patterns of consumers. Recommendation 14 also recommended declaration of naturally occurring dietary fibre be mandated however, the REA process found no research on the effects of declaring naturally occurring fibre.

The overall objective for this work was to outline the likely effects of specifying dietary fibre information in the NIP on consumers' attitudes, knowledge and behaviours.

The objective was addressed by identifying:

- the conditions under which consumers seek out this information
- who uses information about fibre in the NIP
- consumer understanding of this information
- how the information is used in purchase and consumption decisions
- consumer preferences for how this information is expressed, excluding format and presentation.

The secondary objective was to:

- identify and describe the factors that moderate consumers' motivation or ability to seek out, understand, and use information about fibre in the NIP.

The REA was carried out through searching relevant online research databases licensed by FSANZ, through Google and targeted website searching, and by using professional networks. All research documents identified through this process were reviewed for relevancy, resulting in the 23 studies used in this report. More detail on the search and review process is provided in Appendix 2.

This REA is organised such that the content addresses each primary objective in turn. Detail based on the secondary objective is included throughout the narrative. Each section contains a key points summary, showing the main messages from the research in that area. The final section of the report body outlines the limitations of the research literature. Technical and methodological detail on each piece of research is provided in Appendix 1, as well as a quality assessment. The possible quality ratings for the studies are low, medium, and high. All overseas literature, regardless of methodological merit, could only receive a maximum rating of medium, as the results may not be completely generalizable to Australia and New Zealand. For example, the United States of America and Canada mandate the listing of dietary fibre content within the Nutrition Facts Panel (their version of the NIP).

## 2. When do consumers seek out fibre information in the NIP?

### Key points

- Dietary fibre information in the Nutrition Information Panel (NIP) may be used in specific circumstances
- The specific circumstances include consumer perceptions that the food is a source of dietary fibre, and when a consumer is selecting a food for the first time
- Dietary fibre information may not be important for some foods that are not associated with fibre.

Whether consumers look for fibre information on food packaging appears to be influenced by the type of product. When given NIP information in the absence of other product packaging, but knowing the product type, the use of fibre information by Australians and New Zealanders depended on the type of food (Scott et al. 1999). If the food had a fibre association respondents were more likely to use the fibre information in the NIP to help make a nutrition judgement about the food. That is, fibre information was more likely to be used for breakfast cereal and bread compared to margarine. Paterson et al. (2001) found that grocery shoppers reported being more concerned about the fibre content of breakfast cereals and less concerned when the decision related to tinned food, biscuits, or snack foods.

Of the 83 Australian and New Zealand grocery shoppers in the Paterson et al. (2001) study, who mentioned looking at the nutrition information panel on the product they had selected in the supermarket, almost none reported they had looked for fibre information. This level of use is consistent with that reported by respondents in the Stafford et al. (2008) survey, which found that 20% of Australians and 17% of New Zealanders<sup>1</sup> reported using fibre information in the NIP for first time purchases. Other literature, for example the accompanied shops research by Malam et al. (2009) on the use of Front-of-Pack labelling, has shown that repeated purchases of the same foods are associated with a lower use of label information compared to the first purchase of a product.

In a US study using NHANES data (wave not identified), Cook et al. (2011) found that consumers self-reported occasionally<sup>2</sup> looking for fibre information in the Nutrition Facts panel when they use the food label to make a decision. This suggests that the actual use of dietary fibre information in the panel is even lower, as respondents would be unlikely to use the panel for every individual food product purchased. The subset of NHANES respondents in this study was restricted to four groups: those with high cholesterol; with high blood pressure; with both high cholesterol and high blood pressure; and those with neither condition. The four groups were compared on their use of fibre information. Those with high cholesterol levels or hypertension were no more (or no less) likely to use fibre information than respondents without either condition.

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<sup>1</sup> These proportions are not statistically significantly different.

<sup>2</sup> Interpolated from mean scale scores.

### 3. Who uses fibre information in the NIP?

#### Key points

- Up to 39% of consumers appear to use fibre information in the NIP (or its international equivalent), although this prevalence may be an overestimate because it is derived from self-reported data.
- Users may be a distinct subset of consumers, e.g. may be more likely to be female, have higher incomes, or be on a diet.

Australians and New Zealanders who are purposefully trying to select healthier food choices base their decisions on key nutrients, of which fibre is one along with fat, sugar, and salt (Paterson et al. 2001). The NIP is one source of fibre information for consumers, and as noted above, 20% of Australians and 17% of New Zealanders reported using fibre information in the NIP for first time purchases (Stafford et al 2008). However, no literature was located on the sociodemographic characteristics of Australians and New Zealanders who use fibre information in the nutrition information panel (NIP).

Around 32% of American consumers self-reported using fibre information on the Nutrition Facts panel (International Food Information Council Foundation 2008, 2011). Demographics of the users were not reported. About 63% of American consumers reported finding the fibre information in the Nutrition Facts panel helpful (International Food Information Council Foundation 2013), which is approximately double the proportion that appear to use this information as reported by the other studies. Again, no demographic analysis was performed on this finding. Godwin et al. (2006) found that 39% of American adults reported “almost always” using the fibre information on the Nutrition Facts panel, with another 43% “sometimes” reading this information.

The Thomas et al. (1991) study gives a possible lower level for the prevalence of use. They found that only four out of 30 UK grocery shoppers (13%) used fibre information in the nutrition table. As the shoppers had been instructed to eat more healthily prior to entering the shop and some were buying products they had not purchased before, this prevalence appears to be lower than expected.

The Canadian Council of Food and Nutrition (2008) found that Canadian respondents who **both** indicated that nutrition was important **and** reported often/sometimes using whole grains or fibre information to select a food to eat were more likely to report being label readers (90% compared to 67% of non-label readers), were slightly more likely to be female (85% compared to 79% of males), were somewhat more likely to be on a diet (89% compared to 82% of non-dieters), and use increased with age.<sup>3</sup> 17% of respondents who reported changing their diet indicated that the most significant change was to eat more fibre or whole grains. Using mid-1990s data, Kim et al. (2000) found that Americans who used fibre information in the Nutrition Facts Panel tended to have higher incomes, be female, and live in an urban environment. The study by Kim et al. (2000) found no effect for age.

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<sup>3</sup> Proportions for whole grains and fibre reported separately. Highest proportion for either category used: there should be a large overlap and the proportions are extremely similar.

## 4. How well do consumers understand fibre information?

### 4.1 How well is the importance of dietary fibre understood?

#### Key points

- Consumers generally understand that they should consume more dietary fibre
- However, some specific groups of consumers may be less aware that they should consume more dietary fibre
- However, some Australian and New Zealand consumers may be less informed about why dietary fibre is important (e.g. the health benefits).

#### 4.1.1 Understanding that dietary fibre intake is important

As a group, consumers appear to understand that dietary fibre is a nutrient that people should generally consume more of, and this is not a recent phenomenon. A 1989 study of South Australian adults found that increasing fibre intake was ranked as the second most important nutritional change after reducing fat intake (McConaghy 1989). Reducing salt and reducing sugar were both ranked lower in importance. Of those who reported making nutritional changes to their diet, increasing fibre was the fourth most common change reported, after reducing fat, reducing salt, and reducing sugar. Using New Zealand survey data from 1990, Scott et al. (1997) found that 80% of adults knew that people should generally increase their dietary fibre intakes. An Australian/New Zealand study by Scott et al. (1999) found that all respondents knew “it was good to eat more” dietary fibre. More recently, Worsley et al. (2012) found that 76% of Australian adults knew that the average Australian should be eating more high-fibre foods.

However, some types of consumer may be more knowledgeable than others. A 1990 study of Victorian and South Australian adults found that those who consumed relatively low fat diets were more likely to have attempted to increase fibre intakes compared to those with average and relatively higher fat diets (Baghurst et al. 1994). More recently, Mohr et al. (2010) found that almost 90% of Australian adults had heard about the health benefits of dietary fibre, and 65% appeared to be eating a diet high in fibre with an additional 9% intending to increase their dietary fibre intake. After being given a description of resistant starch, respondents were also asked if they had heard of the health benefits of eating resistant starch. Only 16% indicated they had heard of these benefits.

American consumers also understand the importance of dietary fibre. In a recent survey, 78% of consumers reported they had “made an effort” to eat more foods with whole grains (International Food Information Council Foundation 2013), compared to 75% in the previous survey, although that latter figure related to change only over the past year (International Food Information Council Foundation 2012). The 2012 results were segmented, with women and college graduates more likely to report this change.

#### 4.1.2 Understanding the health reasons why dietary fibre intake is important

The New Zealand and Australian results align with international findings. The Canadian Council of Food and Nutrition (2008) noted that the Tracking Nutrition Trends surveys have consistently found Canadians to be knowledgeable about fibre since the first survey in 1989. The most recent Tracking Nutrition Trends survey found that 39% of Canadians used the presence of a “good” nutrient such as fibre to distinguish healthy foods, 79% agreed that “a

high fibre diet may help prevent colon cancer” and 74% agreed that “some types of dietary fibre can help reduce cholesterol in your blood”.

There appears to be some confusion about the health benefits of higher dietary fibre intake. In a study of Adelaide adults, 69% correctly associated increased fruit and vegetable and fibre intakes with reducing the chances of getting some cancers (Hendrie et al. 2008). However, 67% in that study incorrectly believed that increasing fibre intake would help prevent heart disease. Worsley et al. (2012) found that 78% of Australian adults knew that eating more dietary fibre helped prevent heart disease, and 78% knew that eating less dietary fibre would not help prevent obesity.<sup>4</sup>

Finally, consumers who understand the importance of dietary fibre may choose to not use this information when purchasing food. In one study, 22% of Canadians indicated that the whole grains content was not very influential in choosing a food to eat (Canadian Council of Food and Nutrition 2008). The main reason for the lack of influence is that they did not care about the health benefits associated with whole grains (overall, 17% of respondents). Another 3% overall were not aware of the health benefits and 2% overall didn't know why the information was not influential with respect to the health benefits. Knowledge of the benefits of dietary fibre was greater for label readers, and increased with increasing age, income, and self-assessed level of nutrition knowledge. No further analyses were performed on the data.

## 4.2 How well do consumers understand the dietary fibre information in the NIP?

### Key points

- Factors that appear to influence the ability of consumers to understand fibre information include context and format of the information
- Some consumers may not be able to accurately interpret fibre g/100g values

Consumers' ability to accurately use fibre information may be context dependent for some people. In the Australian/New Zealand study by Scott et al. (1999), participants were able to use the NIP fibre information to accurately assess the level of fibre in a cheese NIP (low) but were inaccurate in their assessments of the fibre content of baked beans and breakfast cereal NIPs. However, when asked to pick which of two products was healthier in terms of fibre, almost all respondents were able to accurately complete this task for paired product comparisons of breakfast cereal, bread, and margarine, using the NIP information. Worsley et al. (2012) found that 69% of Australian adults correctly selected which of two NIPs contained the most dietary fibre.

Some consumers appear to require interpretive labelling to understand dietary fibre amounts. Scott et al. (1999) found that, for a baked bean NIP, consumers interpreted the 5.6g/100g amount of dietary fibre to be low because 5.6 is a small number on a 0-100 scale. When this same amount was expressed as its 40% DI value, respondents tended to assess the fibre level as high. Worsley et al. (2012) found that almost 66% of Australian adults incorrectly believed that a fibre level of 5g/100g corresponded to a low amount of dietary fibre, with only 11% correctly interpreting this level as high. Almost 23% indicated they were unsure as to whether 5g/100g was high or low. When a 2.7g/100g amount was then shown on a NIP, along with serving size amount and Percent Daily Intake information, and respondents were informed the product was white bread, 67% correctly rated the bread as low in dietary fibre and the proportion who were unsure dropped to 15%.

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<sup>4</sup> The survey question was asked in this negative form.

When comparing two similar products, the use of g/100g information appears to cause some consumers to view very small differences in the nutrient levels to be important, even if the %DI would be the same for both products (Scott et al. 1999).

### 4.3 Do consumers understand which foods are higher in fibre?

#### Key points

- Some consumers do not appear to understand which foods are higher or lower in dietary fibre
- The level of understanding of dietary fibre content appears to differ across food types
- Bread seems to be particularly well understood with respect to dietary fibre content

The Hendrie et al. (2008) study of Adelaide adults found that people had lower understanding of the fibre content of some foods, compared with added sugar, salt and protein. When presented later with multi-choice options for food choices, only 48% selected sultanas as the high-fibre snack<sup>5</sup> although 73% correctly selected baked beans on wholemeal toast as the high fibre light meal.<sup>6</sup>

Worsley et al. (2012) found that 67% of Australian adults correctly answered that bananas were high in dietary fibre and around 86% knew that wholegrain bread was high. However, only 58% correctly answered that cornflakes were low in dietary fibre, and 59% knew that fish was low. Quite sizeable proportions gave incorrect responses for three of the foods: 30% thought cornflakes were high in dietary fibre, 24% thought fish was high, and almost 22% thought bananas were low. When asked to select which of three types of bread was highest in dietary fibre, 70% chose the wholegrain option, 22% selected the wholemeal option, 2% opted for white bread, and 5% indicated they were unsure.

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<sup>5</sup> Assuming no modification to the General Nutrition Knowledge Questionnaire for adults, the alternative options were: diet strawberry yoghurt; muesli bar; wholemeal crackers and cheddar cheese. The question is phrased as "low fat, high fibre" but the article only reported it as high fibre. The response option shown in the questionnaire is raisins, so the response option could have been modified to sultanas for the Australian sample.

<sup>6</sup> Again assuming no modification, the alternative options were: grilled chicken; cheese on wholemeal toast; quiche. The question is phrased as "low fat, high fibre" not just high fibre, but the article only reported it as high fibre.

## 5. How is fibre information used in purchase and consumption decisions?

### 5.1 Purchase decisions

#### Key points

- Self-reported influence of fibre information in the NIP appears to be larger than actual influence
- The one study that examined the utility of fibre in a NIP equivalent found that consumers valued fibre positively

In qualitative interviews with Australian and New Zealand consumers, Paterson et al. (2001) found that fibre information in the NIP was not commonly used. This research occurred before there was a mandated NIP, so that at this time a NIP was only required on a food where a “nutrition claim” was made.<sup>7</sup> When the NIP was present, the mandated nutrient content was energy, fat, protein, carbohydrate, and the nutrient to which the claim applied, which would include fibre if that or a related nutrient was claimed. As fibre claims would have been on few products, there would be few products that contained fibre information in a NIP, so the result of this study is not surprising.

Garretson and Burton (2000) found that American primary grocery shoppers ranked fibre information as being of some/moderate importance in selecting a frozen dinner food. The mean score for fibre was 5.79 on a 9-point scale, where a higher rating indicated greater importance. Purchase intent for the product, and nutrition attitude about the product, were unaffected by the level of fibre (low or high) stated in the Nutrition Facts panel, even though the low fibre amount was 1g and the high fibre amount was 8g, a sizeable difference. The lack of effect occurred even when the mock package included a content claim for high fibre. There was a significant effect of fibre amount on respondent evaluations of the fibre content of the product. On a 9-point scale, mean evaluation was 4.09 and 5.87 for low and high fibre packages respectively, with a higher score indicating a more favourable rating for fibre. This result shows that respondents were aware of the differences in fibre content, so the lack of impact of fibre content on purchase intent and nutrition attitude is an accurate conclusion to draw from this study.

A majority, 78%, of Canadian survey respondents indicated that the whole grains content of food was somewhat or very influential in choosing a food to eat (Canadian Council of Food and Nutrition 2008). Similarly, when given a list of nutrients, around 82% of Canadians indicated they selected food to eat based on the amount of whole grains and/or fibre.

Lin & Lee (2013) examined sales data for breakfast cereals in the Guiding Stars program at Hannaford stores in the United States. They found that the fibre amount in the Nutrition Facts panel had a positive implicit price of 1.58 cents, which was higher than the value for calories (0.19 cents) but smaller than that for calcium (13.45 cents). This finding indicates that consumers are willing to pay more for cereals with higher fibre content, as indicated by the information in the Nutrition Facts panel.

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<sup>7</sup> S 13A of the New Zealand Food Regulations 1984.

## 5.2 Consumption amounts

### Key points

- Reading the NIP equivalent correlates with a higher dietary fibre intake

With respect to consumption of fibre, Variyam (2008), using 24-hour dietary recall data, found a positive effect of self-reported Nutrition Facts panel use on the fibre intake of Americans. Expressed as nutrient quantity per 1000 calories, people who used the Nutrition Facts panel had a significantly higher intake of fibre (9.1 g compared to 7.5 g for non-users). The regression showed that a 7% increase in fibre consumption was associated with use of the Nutrition Facts Panel, even after correction for possible confounds such as age, self-reported health, gender, and income. These results relate to use of any part of the Nutrition Facts panel, and not specifically to use of fibre information in that panel as that level of detail was unavailable.

Ollberding et al. (2010) found that NHANES respondents who reported using the fibre information in the Nutrition Facts panel had a larger fibre intake compared to respondents who did not report using that information<sup>8</sup>. The mean difference was 1.24 g/day, which equates to just over 4% of the daily adequate intake for males and almost 5% for females.<sup>9</sup> This difference was statistically significant. Using a different subset of the same survey, Post et al. (2011) found that the effect of reading the Nutrition Facts panel on fibre intake also held for consumers with type 2 diabetes, hypertension, hyperlipidemia, or any combination of the three conditions. Those who reported reading the Nutrition Facts panel had a mean fibre intake of 16.0 g/day compared to 14.5 g/day for non-readers. This difference was statistically significant and remained after covariates were taken into account.<sup>10</sup> Fibre seemed to be a particularly salient nutrient: only fibre and sugar showed statistically significant differences between Nutrition Facts panel readers and non-readers.

## 6. What are consumer preferences for how fibre is expressed in the NIP?

No research was located on this question. It is not known whether consumers would prefer information on “fibre”, “dietary fibre”, “naturally occurring fibre” or some other variant. It is unknown whether consumers understand “dietary fibre” and “fibre” to be equivalent, and if they would understand the meaning of “naturally occurring” fibre were this to be declared. Similarly there were no studies identified that tested knowledge and understanding regarding different types of fibre, such as soluble and insoluble. Finally, there was no information located that indicated how consumers would prefer the fibre information to be expressed numerically in the NIP, for example whether they prefer a per serve, per 100g, or %DI basis.

<sup>8</sup> The proportion of respondents using the fibre information in the panel was not provided, although 61.6% of respondents reported any use of the Nutrition Facts panel.

<sup>9</sup> See <http://www.nrv.gov.au/nutrients/dietary%20fibre.htm> for the AI values for dietary fibre for Australia and New Zealand (30 g/day for males and 25 g/day for females, 19 years of age and older). Webpage accessed on 11 July 2013.

<sup>10</sup> Covariates were age, sex, race (American race categories), body mass index, education level, poverty-income ratio, marital status, number of prescription medicines taken. The adjusted means are very similar to the unadjusted means, 16.2 g/day and 14.1 g/day.

## 7. Limitations in the literature

The primary literature gap is the relatively little literature found on fibre information in the NIP and its international equivalents. Consequently the conclusions presented in this report are tentative rather than conclusive. The literature was largely from overseas, where there is no equivalent package labelling to Australia and New Zealand. It is unclear how transferrable overseas findings are to Australia and New Zealand given these environmental differences.

A number of the results reported here are based on self-reported rather than observed behaviour. Two large reviews of consumer labelling behaviour both concluded that self-reported nutrition label reading was much higher than actual label reading (Cowburn & Stockley 2003, Grunert & Wills 2007). These reviews suggest that use of self-reported behaviour in this area will overestimate the proportion of consumers who actually read fibre information in the NIP.

There is a lack of information on how wording the fibre information affects (or not) consumer understanding of that information.

Finally, the literature findings are correlational rather than causal. Increased fibre intakes for those who read the Nutrition Facts panel may not be due to consumers selecting products with higher fibre intake, but may be due to consumers selecting products that have generally better nutrient profiles, one of which may be higher fibre concentrations.

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## Appendix 1 Summary of studies used

Authors	Country	Study type	Products	Achieved sample size	Stimuli used	Relevant outcome measure(s)	Sampling technique	Quality
Baghurst et al. (1994)	Australia	Survey	NA	3209, RR=67%	NA	% who said they had recently increased the fibre in their diet (lowest, middle, and highest fat intake quintiles compared)	Random number generation of person from electoral rolls in the relevant Australia states	Medium
Canadian Council of Food and Nutrition (2008)	Canada	Survey	NA	2003	NA	% who gave a fibre response to question on what makes a food "healthy"?, % reporting food made from whole grains has an influence on food choice (5 response options), % reporting that food made from whole grains is not influential on food choice, reason relating to health benefits (3 response options), % reporting any selection of food to eat on the basis of fibre content (5 response options), % reporting any selection of food to eat on the basis of wholegrains content (5 response options), % correct responses to some types of dietary fibre can help reduce cholesterol in your blood, % correct responses to a high fibre diet may help prevent colon cancer	Random sample from the TNS Canadian Facts proprietary consumer online panel	Medium
Cook et al. (2011)	USA	Survey	NA	2657	NA	Self-reported use of fibre information in the Nutrition Facts panel (5-point scale)	Subset of NHANES respondents, aged 45 years and older, selected on the basis of cholesterol and blood pressure status. 4 groups created (control, high cholesterol, high BP, high cholesterol + high BP). NHANES wave not identified.	Medium
Garretson & Burton (2000)	USA	3 (Nutrition Facts, fat and fibre manipulated) x 5 (content claims) between-subjects factorial design	Frozen dinner (lasagne)	382, RR=66%	Mock frozen lasagne package manipulated as per study design information. One package per respondent.	Mean nutrition attitude (3-item scale), Mean purchase intent (3-item scale), Importance of fibre information in selecting the product (9-point scale)	Self-identified primary grocery shoppers from a state-wide mail household research panel	Medium
Godwin et al. (2006)	USA	Survey	NA	158	NA	% respondents reporting reading the fibre information in Nutrition Facts panel	People aged 18 years and older sampled by students in an Advanced Nutrition course at the Tennessee State University	Low
Hendrie et al. (2008)	Australia	Survey	NA	201	NA	Knowledge of food sources of nutrients, % correct low fat, high fibre snack, % correct low fat, high fibre light meal, % correct fruit/vegetable/fibre effect on cancer, % correct fibre effect on heart disease	Volunteers from community centre participants, who were not attending health-related groups	High
International Food Information Council Foundation (2008)	USA	Survey	NA	1000	NA	% using fibre information in Nutrition Facts panel (interpolated from % using NF panel intersected with % of those using fibre information)	Internet survey of representative sample of Americans aged 18 years and older	Medium
International Food Information Council Foundation (2011)	USA	Survey	NA	1000	NA	% using fibre information in Nutrition Facts panel (interpolated from % using NF panel intersected with % of those using fibre information)	Internet survey of representative sample of Americans aged 18 years and older	Medium
International Food Information Council Foundation (2012)	USA	Survey	NA	1057	NA	% made an effort to eat more foods with whole grains,	Internet survey of Americans aged 18 to 80 years using a market research company's consumer panel	Medium

Authors	Country	Study type	Products	Achieved sample size	Stimuli used	Relevant outcome measure(s)	Sampling technique	Quality
International Food Information Council Foundation (2013)	USA	Survey	NA	1006	NA	% made an effort to eat more foods with whole grains, % found fibre information in Nutrition Facts panel helpful (interpolated from % using NF panel intersected with % of those finding fibre information useful)	Internet survey of Americans aged 18 to 80 years using a market research company's consumer panel	Medium
Kim et al. (2000)	USA	Survey	NA	5203	NA	Demographics associated with fibre information use. Note: uses same data set as Variyam (2000)	US Dept. of Agriculture's 1994-1996 Continuing Survey of Food Intakes by Individuals and the companion Diet and Health Knowledge Survey	Medium
Lin & Lee (2013)	USA	Sales data	Breakfast cereals	NA	NA	Marginal attribute price for fibre, OLS multivariable regression	Sales data at universal product code level of breakfast cereals sold at Hannaford with a Guiding Stars rating, in the week of 4-10 April 2010	Medium
McConaghy (1989)	Australia	Survey	NA	661, RR=66%	NA	Rank order importance of increasing fibre, Rank order percentage increasing fibre in diet	Random selection of people from the South Australian electoral rolls, with a 50/50 split between urban and rural rolls	Low
Mohr et al. (2010)	Australia	Survey	NA	849, RR=40%	NA	% heard of health benefits of dietary fibre, % eating foods high in dietary fibre, % heard of health benefits of resistant starch	Random selection from the Australian electoral roll	High
Ollberding et al. (2010)	USA	Survey	NA	4454 for differences in nutrient intakes	NA	Mean difference in fibre intake	2005-2006 NHANES respondents older than 18 years of age who answered questions on food label use	Medium
Paterson et al. (2001), FSANZ Evaluation Series Report 2	Australia, New Zealand	Discussion groups	Baked beans, Breakfast cereals, Cornflour, Crispbread, Chocolate bar, Sweet biscuits	133	Actual food packaging	Nutrient information in the NIP	Market research group recruitment databases. Participants were selected on the basis of their responses to the recruitment questionnaire developed to record the demographic and other detail used for group stratification.	Medium
	Australia, New Zealand	Surveys	NA	256, but only 83 for NIP	NA	Fibre information on the packaging, Fibre information in the NIP	Supermarket intercept surveys of grocery shoppers	
Post et al. (2010)	USA	Survey	NA	3748 but size of diseased subset unknown	NA	Mean difference in fibre intake	Subset of 2005 – 2006 NHANES respondents 20 years of age or older, with type 2 diabetes, hypertension, hyperlipidemia, or any combination of the three	Medium
Scott & Worsley (1997)	New Zealand	Survey	NA	300, RR=62%	NA	% correct responses for NZ dietary fibre recommendation	Random selection from New Zealand electoral rolls, weighted to 65% women	Medium
Scott et al. (1999)	Australia, New Zealand	Focus groups including quantitative questionnaires	NIP labels only, not product packaging: Baked beans, Bread, Breakfast cereal, Cheese, Margarine, Potato fries (frozen)	27	3 NIP variants, order of presentation to subjects counterbalanced: similar to current NIP format (control), similar to current NIP + %DI format, %DI and per serve only in NIP	% using fibre NIP information, n correct assessments of fibre level (low, med, high), n using fibre information in the NIP, respondent qualitative comments	Market research company using undefined selection criteria apart from main household shopper	Medium
Stafford et al. (2008)	Australia, New Zealand	Survey	NA	1200 Aust 800 NZ	NA	% reporting they normally use the amount of fibre information in the NIP for first purchase	Market research company online panel sample, respondents limited to those aged 14 years and older	Medium

Authors	Country	Study type	Products	Achieved sample size	Stimuli used	Relevant outcome measure(s)	Sampling technique	Quality
Thomas et al. (1997)	UK	Accompanied shop	Breakfast cereal, Cheese, Dessert, Fat or oil for cooking, Main course for dinner, Ready meal (chilled or frozen), Snack: savoury, crisp type, Snack: to eat between meals, Packet soup, Spread (i.e. butter, margarine), Sweet biscuits, Fruit yogurt, Something savoury to put in sandwiches	30	NA	n checking fibre information in the nutrition table, after shopper primed to imagine their doctor had asked them to eat more healthily and were given a list of 13 food products to buy (see Products)	Consumers recruited from two UK supermarket sites, every third person entering each of the stores	Medium
Variyam (2008)	USA	24-hour dietary recall survey	NA	5439, reduced to 4338 who provided info on both food away from home and food at home sources	NA	Difference-in-differences mean fibre intake, NF panel users vs. NF panel non-users, Regression estimate of NF panel use on fibre intake	US Dept. of Agriculture's 1994-1996 Continuing Survey of Food Intakes by Individuals and the companion Diet and Health Knowledge Survey	Medium
Worsley et al. (2012)	Australia	Survey	Bread	2022	NIP only NIP only	% know Australians should eat more high fibre foods, % correctly identify whether food is low or high in dietary fibre (measured for each of 4 foods); % correctly identify the bread type with the highest dietary fibre, % correctly link dietary fibre with prevention of heart disease, % correctly do not link dietary fibre with prevention of obesity, % correctly identify 5g/100g as high dietary fibre, % correctly identify bread as not high in dietary fibre, % correctly identify cereal B as having the most dietary fibre	Quota sampling of Australian adults in an market research group's recruitment database	High

## Appendix 2 REA method

### Inclusion criteria for research

The review was limited to primary research on fibre information in the nutrition information panel (and its equivalents) of packaged food. The review included studies that examined:

- consumer search for dietary fibre information, excluding nutrition content claims, front-of-pack systems.
- consumer preferences for how dietary fibre information is stated (e.g. use of “total dietary fibre” vs. “dietary fibre”).
- consumer understanding of dietary fibre information generally.
- the effect of dietary fibre information on the amount and/or type of food purchased.
- the effect of dietary fibre information on the amount and/or type of food consumed.

### Search strategy

#### *Initial online database search*

Details of the databases and search terms that were used are given below. All electronic databases were searched from the earliest record to June 2013. The electronic databases searched were:

- EBSCO Host (EconLit with Full Text, Food Science Source, FSTA - Food Science and Technology Abstracts, MEDLINE with Full Text, SocINDEX with Full Text)
- Medline
- Psychology and Behavioral Sciences Collection

The following search was undertaken in each database:

1. fiber OR fibre
2. food label\* OR product label\* OR nutrition information\* OR nutrition fact\* OR nutrition value\* OR nutrient content\* OR nutrition panel
3. food preference\* OR food habit\* OR feeding behavior OR eating OR diet OR choice behavior OR choice behaviour
4. use OR utilization
5. understand\* OR comprehen\* OR knowledge OR attitude\*
6. #1 AND #2 AND #3
7. #1 AND #2 AND #4
8. #1 AND #2 AND #5

#### **Other sources**

To ensure that the REA incorporated a suitably broad range of references, the following additional searches were performed:

- FSANZ consumer research reports
- The FSANZ Behaviour and Regulatory Analysis section Reference Manager database
- Google search, and the first 10 pages (200 hits) were assessed
- Specific government websites:
  - Queensland Department of Health
  - NSW Ministry of Health
  - Tasmania Department of Health and Human Services
  - Department of Health, Victoria
  - South Australia Health
  - Western Australia Department of Health
  - Northern Territory Department of Health
  - Department of Health and Ageing
  - Ministry of Health (NZ)
  - Department of Health (UK)

- specific NGO, academic, and member organisation websites:
  - Grains & Legumes Nutrition Council
  - The Gut Foundation
  - Plant & Food Research (NZ)
  - University of Otago
- the International Food Information Council Foundation website
- direct request to the International Social Research Liaison Group
- Subsequent targeted online database search using these terms combined:
  - fiber OR fibre, and
  - understand\* OR comprehen\* OR knowledge OR attitude\*

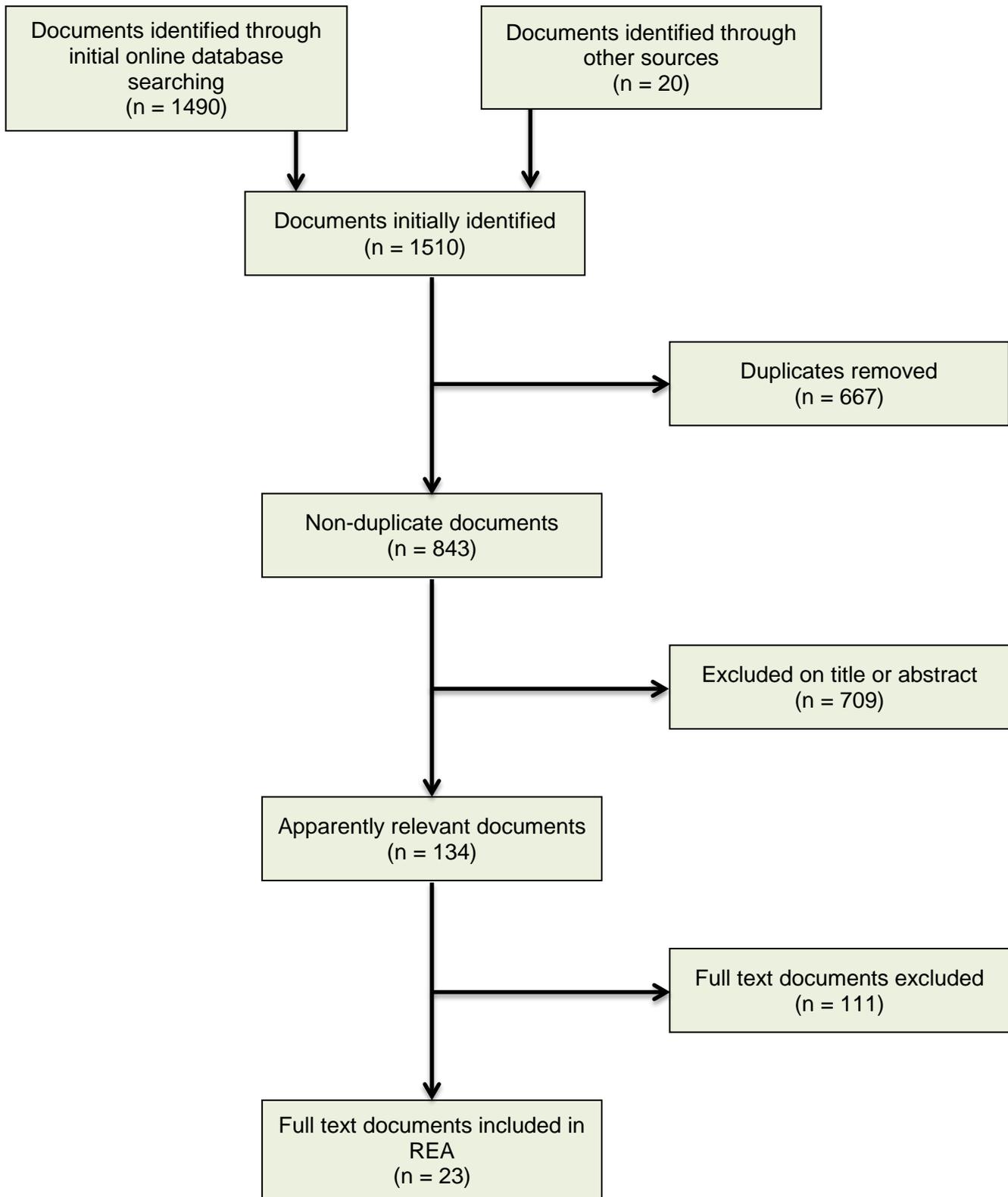
### **Research review process**

The review process is outlined in Figure A2.1 on the following page. The search process initially identified 1510 potentially relevant research documents. A systematic, objective culling process was then implemented. The initial task was to identify and remove duplicates. Following this, documents that were clearly out of scope on the basis of the title and/or abstract were then excluded. Finally, documents identified as out of scope on the basis of full-text review were excluded. This resulted in 23 research documents included in the REA, and which are described in Appendix 1.

Each included research document has had a quality assessment applied. This is a qualitative assessment, based on the categories of low, medium, and high. Studies with numerous issues such as small sample size, major weaknesses in study design (including relevance of stimuli), analyses that were indirectly related to the scope of this REA, or were quite old were penalised. Additionally, any well-designed and analysed recent study that was not conducted in Australia or New Zealand, so the direct relevance of the findings is assumed rather than proven, could only achieve a maximum rating of medium.

### **Selection of research reports**

The potential research documents were then assessed for inclusion in this REA. The process is summarised below in Figure A2.1.



**Figure A2.1. Number of documents retrieved at various stages of the review process.**