

Characteristics of consumers using 'better for you' front-of-pack food labelling schemes – an example from the Australian Heart Foundation Tick

Susan L Williams^{1,*} and Kerry W Mummery²

¹Institute for Health and Social Science Research, Central Queensland University, North Rockhampton, Queensland 4702, Australia; ²Faculty of Physical Education and Recreation, University of Alberta, van Vliet Centre, Edmonton, Alberta, Canada

Submitted 2 July 2012: Final revision received 16 September 2012: Accepted 23 October 2012: First published online 27 November 2012

Abstract

Objective: The Heart Foundation Tick aims to help consumers make healthier food choices and overcome confusion in understanding food labels. Little is known about what factors differentiate frequent from infrequent users and the effectiveness of this scheme in helping Australians make healthier food choices.

Design: A cross-sectional survey was used to explore use of the Tick and associations with a range of individual characteristics.

Setting: A national panel of Australians, living in each state and territory, completed an online survey (*n* 1446).

Subjects: Adult men (41%) and women participated in the study.

Results: Most trusted the Heart Foundation (79%), and used the Tick at least occasionally (19% regularly, 21% often, 35% occasionally, 24% never). A majority was classified as overweight/obese (60%), 3.5% were diagnosed with CHD, 5.2% with diabetes and 23% with hypertension. Many did not meet recommendations for the consumption of red meat (30%), processed meat (23%), vegetables (78%), fruit (43%) and fast foods (47%). Female frequent users tended to have hypertension, be married/*de facto*, older than 45 years, rural dwellers, and limit their intake of fast foods. Male frequent users tended to have hypertension, meet recommendations for fruit, vegetables and processed meats, but not have a tertiary education.

Conclusions: The Heart Foundation Tick is a highly trusted, highly recognizable food labelling scheme and helpful to consumers who are motivated to make healthier food choices. More inter-sector collaboration is required to incorporate these schemes into public health campaigns to help consumers make healthier food choices.

Keywords
Food labelling
Signposting
Food intake behaviours
Health promotion

Food labelling has been introduced to create effective food regulation systems which promote consumer confidence and safety in food purchases and consumption, and permit consumer access to information on food attributes⁽¹⁾. Food labelling schemes may include front-of-pack (FOP) or back-of-pack labelling or logos, nutrient information panels, ingredient lists, allergen lists, instructions for storage and preparation, and/or health claims and warning statements, all of which are designed to create healthy food environments and provide a communication tool to help consumers make informed food choices⁽²⁾. Research has found that the perceived healthiness of a food (as established by food label health claims) is unlikely to greatly influence food purchase decisions⁽³⁾ and that consumers' prior belief about the healthiness of a certain food is generally a more important

influence on purchase decisions than health claims made on food packaging⁽⁴⁾. Studies have also found that people with unhealthy diets are less likely (than those with healthier diets) to be influenced by food labels when making decisions about which food products they will purchase^(5–8). Consumers who use food labels and nutrition information on food packaging are more likely to be highly educated, nutritionally knowledgeable^(9–12), female, older, with a healthy weight and/or weight conscious^(13–15), diagnosed with a chronic disease^(12,14–16), acknowledge the diet–disease relationship, have accurate self-perception of body weight and live in urban areas⁽¹¹⁾.

A major challenge of promoting use of nutrition labels and claims is ensuring that consumers understand the label and that it does, indeed, assist them in making appropriate food choices⁽¹⁷⁾. At least half of all packaged

*Corresponding author: Email s.p.williams@cqu.edu.au

food products available in Australia carry some type of nutrition-related claim⁽¹⁸⁾, and the presence of endorsements and health claims (terms such as 'low fat', 'low GI', 'heart smart' and 'high fibre', to name a few) on food packaging, in addition to the nutrition information panels, may have led to consumer confusion and scepticism^(19,20). While health claims on food packaging have the potential to help consumers make healthier choices^(21,22) and survey reports show that a majority of consumers use some form of nutrition label information at least occasionally^(14,23), studies of consumers in real-world shopping environments report much lower rates of use^(2,24). So, while consumers may see health claims and understand them, they may not actually base their final purchase decision on this information.

Many consumers who look at nutrition information labels find them too complex or confusing^(20,25,26) and as a result, many organizations have introduced simple FOP labelling schemes to help consumers make healthier food choices and present nutrition information in a format that is easy to interpret at a glance⁽²⁷⁾. Like other food labelling systems, FOP labelling (or signposts) are not designed as stand-alone tools for influencing consumer behaviour, but as one of many strategies which fit within the context of broader public health prevention strategies⁽¹⁾. The three main FOP labelling systems include: colour-coded (traffic light) systems; Percentage Guideline Daily Amount (% GDA) systems; and 'better for you' schemes⁽²⁷⁾. These simple messages and images or logos on food labels have been found to be favoured by many consumers^(28–30) and help consumers choose a healthier option⁽³¹⁾. 'Better for you' labelling schemes (e.g. Finnish Heart Symbol, Swedish Keyhole, Eat Smart (USA), Smart Choices (USA), Health Check (Canada), Choices logo (The Netherlands), Heart Foundation Tick (Australia)) are thought to be a more effective way of conveying nutritional information to consumers than providing detailed information, particularly given that consumers with unhealthy dietary habits are less likely to even look for nutritional information when purchasing food⁽³²⁾.

The Heart Foundation (HF) Tick is an example of a 'better for you' FOP food labelling scheme which was launched by the National Heart Foundation of Australia more than two decades ago, following introduction of the Australian Dietary Guidelines and in response to a call from the majority of Australians who were not meeting these guidelines and needed help to choose healthier foods⁽³³⁾. The Tick programme has dual aims of (i) bringing about positive change in food production by influencing food companies and outlets to manufacture and market foods that meet nutrition standards and (ii) helping consumers overcome confusion with food labels by signposting healthier choices with the Tick⁽³³⁾. In general, Tick-approved foods and meals have met strict standards for saturated fat, *trans*-fat, sodium and, where appropriate, energy and fibre.

There are relatively few studies of 'better for you' labelling schemes. International studies include: a study of the Finnish Heart Symbol which reported high recognition of the symbol by women and highly educated groups, and a major increase in use, particularly in those with lower education levels⁽³⁴⁾; a study of the Canadian Health Check programme which reported positive associations between awareness of the programme, use of related products and use of other information on food packages, and negative associations between use of Health Check products and dietary fat intake⁽³⁵⁾; and a study of the actual use of the Dutch Choices logo, which also found greater recognition by women and those with higher education levels, but greater use in those with a medium (secondary schooling) level of education and those who were health-conscious and weight-conscious⁽¹³⁾. In Australia, Tick tracking studies have reported that a majority of Australians are aware of the Tick, use and trust the Tick, believe the Tick provides a healthier option⁽³³⁾, and agree the Tick makes choosing healthier foods easier⁽³⁶⁾. All of these studies have reported high levels of recognition of the logos within their respective populations; however, due to the limited number and scope of these previous studies, there remains limited understanding of what consumer characteristics are associated with their use. Previous independent studies of the HF Tick (in Australia and New Zealand) have focused on investigating the impact of the Tick programme on food formulation^(37,38), not the characteristics of consumers who are using (or not using) the Tick. The aim of the present study was to identify who uses the HF Tick, what individual health and nutrition factors are associated with use of the Tick and what factors are associated with not using the Tick. Understanding what sociodemographic, health and dietary intake factors differentiate frequent users from infrequent users of the Tick may inform how these schemes could be improved to help more consumers make healthier food choices.

Methods

Study design and participants

The present study examined data from the Australian Health and Social Science 'Exploring attitudes towards nutritional information' panel survey, conducted by the Population Research Laboratory at Central Queensland University, Australia. This national panel (n 2065), recruited via computer-assisted telephone interviewing, included a random sample of Australian adults living in each Australian state and territory, who consented to participate in research by undertaking surveys. The online survey was conducted in October 2009, administered using SSi Web V6-6 (Sawtooth Software), and the final sample included 1446 respondents (response rate 70%). Each participant was sent a personalized email which

contained general information about the survey, instructions on how to access the online survey, and a unique password to enable participants to re-start the survey and for tracking and targeted reminders. Ethical approval was received before administration to the general public (October 2009) from the Human Ethics Research Review Panel at Central Queensland University.

Measures

The Heart Foundation Tick

To assess consumer use of the HF Tick, participants were asked to respond to the question: 'How often while grocery shopping do you look for the Heart Foundation Tick symbol/logo?' Response options were 'regularly', 'often', 'occasionally' and 'never'; for logistic regression analyses, responses were dichotomized to 'frequently' (regularly/often) or 'rarely' (occasionally/never). Participants were also asked: 'To what extent do you agree with the statement "Eating foods with the Heart Foundation Tick symbol/logo will help me eat a healthy diet"?' with the five response options (anchored by (i) strongly agree and (v) strongly disagree) dichotomized to 'agree' or 'disagree'. To assess overall trust in the HF Tick, participants were asked: 'How trustworthy do you believe the National Heart Foundation is?' The seven response options ranging from 'not trustworthy at all' to 'extremely trustworthy' were dichotomized to either 'yes' or 'no' based on the mean cut-off.

To identify some possible reasons for not using the Tick, participants were asked: 'Why have you NOT looked for the Heart Foundation Tick symbol/logo when grocery shopping in the past 30 d?' Nine closed-response options were provided as well as an open-ended option to specify 'other' reasons. All explanations provided by the respondents were analysed and reduced to eight reasons: (i) 'have never heard of the symbol'; (ii) 'do not trust the symbol or organization'; (iii) 'too expensive'; (iv) 'do not look for symbols/logos in general'; (v) 'I am healthy so I do not worry about my diet'; (vi) 'do not eat much packaged food'; (vii) 'prefer to make own decisions about a product'; or (viii) 'do not believe Tick products are better/healthier/safer'.

Health conditions

Participants self-reported body weight and height, from which BMI (kg/m^2) was calculated for determination of weight status. Participants were subsequently classified into one of two categories: 'healthy weight' ($\text{BMI} < 25 \text{ kg/m}^2$) or 'overweight' ($\text{BMI} \geq 25 \text{ kg/m}^2$). To identify prevalence of selected chronic health conditions, participants were asked to respond 'yes' or 'no' to the question: 'Have you ever been told by a doctor that you have any of the following chronic health problems?' (including arthritis, asthma, cancer, stroke, emphysema, CHD (heart attack, angina), diabetes (type 1 or type 2), high blood pressure, kidney disease, depression, anxiety and osteoporosis). For the

present study, the chronic health conditions included in analyses were CHD, diabetes and hypertension.

Food intake behaviours

Participants were asked to respond to questions regarding their usual intakes of fruit, vegetables, red meat, processed meats and fast foods. To assess fruit and vegetable intakes, participants were asked to report how many servings of vegetables/fruit they eat on a usual day (examples of serving equivalents were provided). Continuous responses were dichotomized according to current recommendations for fruit (2 servings/d) and vegetables (5 servings/d)⁽³⁹⁾. To assess red meat and processed meat intakes, participants were asked to report for each type of meat, how often they usually eat: red meat (beef, lamb, liver and kidney but not pork or ham; including minimally processed forms such as chops, steaks, roasts, rissoles, hamburgers, mince, stir fries and casseroles) and meat products (sausages, frankfurters, Belgium sausage, devon, salami, meat pies, bacon or ham). Response options included 'never', 'less than once a month', 'once a month', 'two or three times a month', 'once a week', 'two or three times a week', 'four or five times a week' and 'more than five times a week'. For analytic purposes responses were dichotomized according to recommendations for red meat: (i) 0–3 times/week and (ii) ≥ 4 times/week; and for processed meats: (i) 0–1 time/week and (ii) ≥ 2 times/week⁽³⁹⁾. To assess intake of fast foods/takeaway foods, participants were asked to report how many times in the last week they ate something from a fast-food or takeaway restaurant like McDonald's, Hungry Jack's, KFC, etc. (this also included other fast foods and takeaways such as fish and chips, Chinese/Asian food and pizza, for example). For analysis, responses were dichotomized to: (i) 0–1 time/week and (ii) ≥ 2 times/week.

Demographics

Sociodemographic information included age, gender, education, marital status, household annual income and living locality. Respondents were categorized into one of two age groups (18–44 years, ≥ 45 years), based on their self-reported age on their last birthday. Participants were asked to report their current marital status and were subsequently categorized into one of two groups: (i) single/divorced/separated; or (ii) married/*de facto*. Respondents provided information regarding their highest level of education (complete or incomplete) and were categorized into one of three groups: (i) secondary/high school (or less); (ii) technical/technical and further education/trade; or (iii) tertiary/university degree. Participants were asked to select one of six monthly income brackets to report their approximate annual household income (before tax); these were reduced to the following three income brackets: (i) $< \$\text{AUD } 30\,000$; (ii) $\$ \text{AUD } 30\,000\text{--}100\,000$; and (iii) $> \$\text{AUD } 100\,000$.

Table 1 Descriptive statistics for use of the Heart Foundation (HF) Tick, by gender: adult Australian men and women who completed an online survey, October 2009

Variable	Total sample (<i>n</i> 1446)		Males (<i>n</i> 595)		Females (<i>n</i> 841)		<i>P</i> value†
	<i>n</i>	Use of HF Tick* (%)	<i>n</i>	Use of HF Tick* (%)	<i>n</i>	Use of HF Tick* (%)	
Use of the HF Tick							
Trust in HF organization (<i>n</i> 1089)							
No	225	32.0	90	31.1	135	32.6	0.815
Yes	864	58.9	327	55.7	535	60.9	0.126
Tick helps healthy diet (<i>n</i> 1089)							
Disagree	204	28.9	78	26.9	126	30.2	0.620
Agree	885	59.0	339	55.8	544	61.0	0.121
Health conditions							
Weight status (<i>n</i> 1419)							
Healthy weight‡	571	36.3	176	25.6	395	41.0	0.0001
Overweight§	848	43.3	415	39.5	433	46.9	0.030
CHD (<i>n</i> 1440)							
Diagnosed	50	74.0	41	70.7	9	88.9	0.261
No diagnosis	1390	39.1	554	32.7	832	43.5	0.0001
Diabetes (<i>n</i> 1440)							
Diagnosis	75	56.0	40	52.5	35	60.0	0.514
No diagnosis	1365	39.5	555	34.1	806	43.3	0.001
Hypertension (<i>n</i> 1440)							
Diagnosis	331	54.4	167	49.7	163	59.5	0.074
No diagnosis	1109	36.2	428	29.7	678	40.3	0.0001
Food intake behaviours							
Fruit intake (<i>n</i> 1439)							
≥2 servings/d	824	44.8	309	41.1	513	47.2	0.009
0–1 servings/d	615	34.5	286	29.0	328	39.0	0.090
Vegetable intake (<i>n</i> 1413)							
≥5 servings/d	173	49.7	52	63.5	120	44.2	0.020
0–4 servings/d	1240	39.3	528	32.6	710	44.2	0.0001
Red meat intake (<i>n</i> 1439)							
0–3 times/week	1010	39.4	406	33.7	603	43.3	0.002
≥4 times/week	429	42.7	189	38.6	238	45.8	0.137
Processed meat intake (<i>n</i> 1439)							
0–1 times/week	1112	42.4	423	38.5	687	44.8	0.039
≥2 times/week	327	33.3	172	27.3	154	40.3	0.013
Fast-food intake (<i>n</i> 1438)							
0–1 times/week	677	43.1	265	37.7	412	46.6	0.023
≥2 times/week	761	37.8	330	33.3	429	41.5	0.022

*Reported using the HF Tick 'frequently', which includes response options 'regularly' and 'often'.

†*P* value of Pearson χ^2 analysis of gender differences.

‡Healthy weight: BMI < 25 kg/m².

§Overweight: BMI ≥ 25 kg/m².

Participants were also asked to report if they presently lived in a city, town or rural area, and for final analysis these were reduced to two categories: (i) urban; and (ii) rural.

Statistical analysis

Statistical analyses were conducted in 2011 using PASW Statistics 18.0 for Windows. Table 1 presents descriptive statistics for 'frequent' use of the HF Tick, stratified by gender and calculated for all variables included in the study. Pearson χ^2 analysis was conducted to examine gender differences across all independent variables (included in Table 1). Binomial logistic regression analyses (by gender) were performed and results of adjusted odds ratios (95% confidence intervals) for associations between regular use of the HF Tick and health conditions, food intake behaviours and demographic characteristics are presented in Table 2.

Results

The overall study sample (*n* 1446) comprised more females (59%) than males, with a mean age of 51 (SD 12.9) years. The majority of participants were married (81%), had a tertiary education (52%), were employed (39% full-time; 26% part-time/casual), earned between \$AUD 30 000 and \$AUD 100 000 (60%; 15% earned <\$AUD 30 000 and 25% >\$AUD 100 000) and reported living in an urban area (60%; 25% in a town, 15% rural). Overall, 76% reported looking for the Tick at least occasionally (19% regularly, 21% often, 35% occasionally, 24% never), 79% reported trust in the HF organization and 59% agreed that eating foods with the Tick would help them to eat a healthy diet. Of those who reported never using the Tick (*n* 351), 43% said they did not look for symbols/logos; 17% did not trust the HF organization; 13% did not believe products with the

Table 2 Adjusted odds ratios (and 95% confidence intervals) for associations between frequent* use of the Heart Foundation (HF) Tick and trust in the HF organization, belief in the HF Tick, sociodemographic characteristics, health conditions and food intake behaviours: adult Australian men and women who completed an online survey, October 2009

Variable	Males (n 595)		Females (n 841)	
	Adjusted OR†	95% CI	Adjusted OR†	95% CI
Trust in HF organization				
No	1.00	Ref.	1.00	Ref.
Yes	2.89	1.55, 5.40	2.56	1.52, 4.33
Tick helps healthy diet				
Disagree	1.00	Ref.	1.00	Ref.
Agree	3.31	1.66, 6.62	3.07	1.77, 5.32
Sociodemographic characteristics				
Age (years)				
18–44	1.00	Ref.	1.00	Ref.
≥45	0.99	0.53, 1.89	1.89	1.26, 2.84
Marital status				
Single/divorced/separated	1.00	Ref.	1.00	Ref.
Married/ <i>de facto</i>	1.04	0.52, 2.08	2.17	1.33, 3.54
Education				
Secondary (or less)	1.00	Ref.	1.00	Ref.
Technical/TAFE/trade	0.67	0.32, 1.38	1.03	0.61, 1.76
Tertiary/university degree	0.43	0.21, 0.87	0.83	0.51, 1.34
Annual household income				
<\$AUD 30 000	1.00	Ref.	1.00	Ref.
\$AUD 30 000–100 000	1.26	0.56, 2.82	1.14	0.68, 1.91
>\$AUD 100 000	0.96	0.39, 2.38	0.70	0.37, 1.30
Living locality				
Urban	1.00	Ref.	1.00	Ref.
Rural	1.56	0.65, 2.56	1.51	1.03, 2.22
Health conditions				
Weight status (n 1419)				
Healthy weight‡	1.00	Ref.	1.00	Ref.
Overweight§	1.05	0.61, 1.80	1.04	0.71, 1.52
CHD (n 1440)				
No diagnosis	1.00	Ref.	1.00	Ref.
Diagnosed	2.48	0.99, 6.16	6.02	0.55, 65.86
Diabetes (n 1440)				
No diagnosis	1.00	Ref.	1.00	Ref.
Diagnosis	1.02	0.41, 2.52	1.23	0.46, 3.31
Hypertension (n 1440)				
No diagnosis	1.00	Ref.	1.00	Ref.
Diagnosis	2.52	1.78, 4.31	1.85	1.12, 3.07
Food intake behaviours				
Fruit intake (n 1439)				
0–1 servings/d	1.00	Ref.	1.00	Ref.
≥2 servings/d	1.75	1.08, 2.85	1.21	0.83, 1.77
Vegetable intake (n 1413)				
0–4 servings/d	1.00	Ref.	1.00	Ref.
≥5 servings/d	2.80	1.19, 6.58	0.69	0.41, 1.17
Red meat intake (n 1439)				
≥4 times/week	1.00	Ref.	1.00	Ref.
0–3 times/week	0.66	0.39, 1.13	1.13	0.75, 1.70
Processed meat intake (n 1439)				
≥2 times/week	1.00	Ref.	1.00	Ref.
0–1 times/week	2.04	1.19, 3.49	1.34	0.86, 2.16
Fast-food intake (n 1438)				
≥2 times/week	1.00	Ref.	1.00	Ref.
0–1 times/week	1.27	0.77, 2.09	1.57	1.06, 2.30

TAFE, technical and further education; Ref., reference category.

*Reported using the HF Tick 'frequently', which includes response options 'regularly' and 'often'.

†OR mutually adjusted for all other variables in the table.

‡Healthy weight: BMI < 25 kg/m².

§Overweight: BMI ≥ 25 kg/m².

Tick were better/healthier/safer; 12% said they were healthy and did not need to worry about their diet; 5% preferred to make their own decisions about products; 4% said they did not eat much packaged food; 3% had

never heard of the Tick symbol; and 2% believed products with the Tick were too expensive.

As shown in Table 1, the highest proportions of frequent users of the Tick were those who agreed the HF

Tick helps them eat a healthy diet; were overweight; diagnosed with CHD, diabetes or hypertension; consumed two or more servings of fruit daily; consumed five or more servings of vegetables daily; limited their intake of processed meats; and limited their intake of fast foods. Pearson χ^2 analysis showed significant differences between males and females for all health conditions and food intake behaviour variables.

Logistic regression analyses (with simultaneous adjustment for all associations and gender; Table 2) show that males who frequently used the Tick were less likely to have a tertiary education (OR = 0.43, $P=0.009$), but more likely to report trust in the HF organization (OR = 2.89, $P=0.0001$); agree that eating foods with the Tick would help them eat a healthy diet (OR = 3.31, $P=0.002$); be diagnosed with hypertension (OR = 2.52, $P=0.002$); consume at least two servings of fruit daily (OR = 1.75, $P=0.03$) and at least five servings of vegetables daily (OR = 2.80, $P=0.02$); and limit their weekly intake of processed meats (OR = 2.04, $P=0.006$). Females who frequently used the Tick were more likely to be over the age of 45 years (OR = 1.89, $P=0.01$); be married/*de facto* (OR = 2.17, $P=0.001$); live in a rural area (OR = 1.51, $P=0.035$); report trust in the HF organization (OR = 2.56, $P=0.001$); agree that eating foods with the Tick would help them eat a healthy diet (OR = 3.07, $P=0.0001$); be diagnosed with hypertension (OR = 1.85, $P=0.04$); and limit their weekly intake of fast foods (OR = 1.57, $P=0.04$).

Discussion

The results of our study are consistent with previous Tick tracking studies^(33,36) which have reported high proportions of consumers who trust and use the Tick. The high levels of trust in the HF Tick and belief that eating food with the Tick would help participants consume a healthy diet underpin the high levels of (at least occasional) use of the Tick and lend support to use of these simple 'better for you' food labelling schemes to promote healthier food choices.

Similar to previous food label studies, we found significant associations between frequent use of the Tick and self-reported diagnosis of CHD, diabetes and hypertension^(12,16). In unadjusted regression analyses, significant positive associations were found for use of the HF Tick and diagnosis of CHD (males: OR = 4.98; $P=0.0001$; females: OR = 10.39; $P=0.03$) and diabetes (males only: OR = 2.14; $P=0.02$), but after simultaneous adjustment for all associations, the odds ratios indicated that frequent use of the Tick was associated with self-reported diagnosis of hypertension only. Compared with the most recent national health survey⁽⁴⁰⁾ we found higher diagnosis rates of CHD for males (7% *v.* 4%) and lower rates for females (1% *v.* 2%) and higher diagnosis rates of

diabetes (5% *v.* 4%); however, relatively small sample sizes for these conditions may have contributed to these findings⁽⁴¹⁾ and future studies with larger samples of those diagnosed with these health conditions may extend understanding of these relationships. Our findings are supportive of previous studies which have found better nutrition awareness, food label use and checking behaviours in those diagnosed with chronic diseases^(12,16). These findings may reflect lifestyle and dietary modifications which individuals with hypertension have undertaken in treating and managing their condition⁽⁴²⁾ and/or highlight the effectiveness of the Tick (and other simple FOP labelling systems) in helping to reduce dietary salt intake⁽³¹⁾.

Our finding for greater use of the Tick by males with lower education levels is incongruent with previous studies^(9,10,13) but similar to a study of the Finnish Heart Symbol, which found a major increase in awareness and use of the symbol in men with lower education levels⁽³⁴⁾. These findings suggest the Tick (as an example of a 'better for you' food labelling scheme) may be more effective in conveying nutritional information to consumers with lower education levels, but further investigation of these associations would help to understand why these schemes are being used less by those with higher education levels. Do these labelling systems create scepticism, not appeal to those with higher education levels, or are those with higher education levels consuming less packaged foods?

In the present study we found gender differences in use of the Tick, with male frequent users more likely to report healthier intakes of fruit, vegetables and processed meats, and female frequent users more likely to limit their weekly intake of fast foods. These findings highlight the complexity of food choices, health behaviours and gender differences which exist in these behaviours⁽⁴³⁾, and also suggest greater acceptance of these simple food labelling formats by males who are required to make dietary changes. To increase use of the Tick (by males in particular), greater attention could be paid to promoting these products and food labelling systems in medical centres and hospitals, and through health practitioners such as general practitioners, dietitians and nurses, at the time of diagnosis and treatment⁽¹⁶⁾. However, with males in Australia and New Zealand accessing health services at lower levels than females^(43,44), use of other community settings or workplace initiatives to provide factual information about the Tick (and other 'better for you' labelling schemes) may be most effective in promoting their use and helping men to choose healthier foods⁽⁴⁵⁾.

In our study, 40% of participants reported living in rural areas and our finding of greater use of the Tick by women living in these areas contrasts with a recent study of US adults which found food label use less likely in rural dwellers⁽¹¹⁾. Our finding may reflect regional lifestyle and health differences in Australia, where women in rural

areas may be more often the primary household food shopper, or have higher rates of hypertension (and better nutrition awareness and food label use)⁽¹²⁾, compared with women living in urban areas⁽⁴⁶⁾. Further investigation is warranted to better understand differences in food label use between metropolitan, regional and rural areas, and to develop promotional programmes tailored to the different needs and/or interests/motivations of these groups.

Despite an apparent high level of use of the Tick, our study found a higher proportion of consumers who reported never looking for the Tick (24%) than those who reported regular use of the Tick (19%). Reasons provided by those who never use the Tick suggest that although this 'better for you' food labelling scheme is simple, easy and favoured by many, additional and innovative promotion of the HF organization and the Tick scheme is required, as well as greater clarification of the intent and significance of these 'better for you' logos and symbols. As suggested by Rayner *et al.*⁽²⁴⁾, inclusion of more explicit explanation with the logo (such as 'less than x % fat', 'high fibre') may promote greater use of the Tick. These findings also highlight that the Tick and other such food labelling schemes have limited impact as stand-alone preventative health measures and greater use may be achieved through inter-sector collaboration and incorporation of these schemes into comprehensive and coordinated preventative health campaigns^(47,48). This could include the development of partnered research between the HF and research centres and supermarkets to develop an intervention which incorporates the HF Tick as just one component of a multi-component public health campaign. For example, a point-of-sale campaign which prompts consumers to consider the healthiness of their diet (e.g. intake of saturated fat), provides educational materials in relation to heart health and the Tick, and monitors consumer purchasing behaviours may increase consumer awareness for a healthy diet, the possible need to make different food choices and ultimately increase consumer use of the Tick.

The findings of our study are subject to limitations. The self-report survey data may not accurately reflect actual purchasing of food products with the Tick⁽²⁴⁾ and variability between actual and reported use may weaken associations. The study cohort was of middle age and results are likely not generalizable to younger population groups. The use of computer-assisted telephone interviewing and the requirement for Internet access to complete the survey may have limited representativeness, although 74% of Australian households had Internet access in 2008–2009⁽⁴⁹⁾.

Conclusions

The HF Tick is an example of a 'better for you' labelling scheme which appears to be effective in helping some consumers make healthier food choices; however, this

scheme is not consistently being used by many who could benefit. The present study highlights that simple 'better for you' nutrition labelling schemes (such as the HF Tick) are highly recognizable and helpful for consumers who have lower education levels or those already motivated to make healthier food choices. The challenge remains how to achieve greater use of food labels and food labelling systems by the general population and – in relation to the findings of the present study – how to increase use by younger consumers and those not diagnosed with a related chronic disease. In the context of public health prevention, more innovative promotion of the intent of these 'better for you' food labelling schemes is required; and as recognized by the Heart Foundation, although labelling does have an important role to play, in isolation it will achieve very little⁽⁵⁰⁾. More collaborative action to create synergistic health promotion programmes that incorporate the various food labelling systems into broader public health campaigns may promote greater use of the HF Tick and help more Australians make healthier food choices.

Acknowledgements

Source of funding: This research received no specific grant from any funding agency in the public, commercial or not-for-profit sector. *Conflicts of interest:* The authors have no conflict of interest. *Authors' contribution:* S.L.W. was responsible for leading the development of the research question, data analysis and manuscript analysis. K.W.M. was responsible for survey development.

References

1. Blewett AC, Goddard N, Pettigrew S *et al.* (2011) *Labelling Logic – Review of Food Labelling Law and Policy*. Canberra: Department of Health and Ageing, Commonwealth of Australia.
2. Cowburn G & Stockley L (2003) *A Systematic Review of the Research on Consumer Understanding of Nutrition Labelling*. Brussels: European Heart Network.
3. Borgmeier I & Westenhoefer J (2009) Impact of different food label formats on healthiness evaluation and food choice of consumers: a randomized-controlled study. *BMC Public Health* **9**, 184.
4. Williams P, Ridges L, Batterham M *et al.* (2008) Australian consumer attitudes to health claim – food product compatibility for functional foods. *Food Policy* **33**, 640–643.
5. Kreuter MW, Brennan LK, Scharff DP *et al.* (1997) Do nutrition label readers eat healthier diets? Behavioral correlates of adults' use of food labels. *Am J Prev Med* **13**, 277–283.
6. Lin CT, Lee JY & Yen ST (2004) Do dietary intakes affect search for nutrient information on food labels? *Soc Sci Med* **59**, 1955–1967.
7. Neuhouser ML, Kristal AR & Patterson RE (1999) Use of food nutrition labels is associated with lower fat intake. *J Am Diet Assoc* **99**, 45–53.
8. Thedford K (2005) Food labels: who is being educated? *J Am Diet Assoc* **105**, 402–403.

9. Drichoutis AC, Lazaridis P & Nayga RM (2006) Consumers' use of nutritional labels: a review of research studies and issues. *Acad Mark Sci Rev* **9**, 1–22.
10. Fullmer S, Geiger CJ & Parent CRM (1991) Consumers' knowledge, understanding, and attitudes toward health claims on food labels. *J Am Diet Assoc* **91**, 166–171.
11. Chen X, Jahns L, Gittelsohn J *et al.* (2012) Who is missing the message? Targeting strategies to increase food label use among US adults. *Public Health Nutr* **15**, 760–772.
12. Lewis JE, Arheart KL, LeBlanc WG *et al.* (2009) Food label use and awareness of nutritional information and recommendations among persons with chronic disease. *Am J Clin Nutr* **90**, 1351–1357.
13. Vyth EL, Steenhuis IH, Vlot JA *et al.* (2010) Actual use of a front-of-pack nutrition logo in the supermarket: consumers' motives in food choice. *Public Health Nutr* **13**, 1882–1889.
14. Satia JA, Galanko JA & Neuhauser ML (2005) Food nutrition label use is associated with demographic, behavioral, and psychosocial factors and dietary intake among African Americans in North Carolina. *J Am Diet Assoc* **105**, 392–402.
15. Bower JA, Saadat MA & Whitten C (2003) Effect of liking, information and consumer characteristics on purchase intention and willingness to pay more for a fat spread with a proven health benefit. *Food Qual Prefer* **14**, 65–74.
16. Post RE, Mainous AG 3rd, Diaz VA *et al.* (2010) Use of the nutrition facts label in chronic disease management: results from the National Health and Nutrition Examination Survey. *J Am Diet Assoc* **110**, 628–632.
17. Tee ES (2002) Nutrition labelling and claims: concerns and challenges; experiences from the Asia Pacific Region. *Asia Pac J Clin Nutr* **11**, Suppl. 2, S215–S223.
18. Williams PG, Yeatman H, Zakrzewski S *et al.* (2003) Nutrition and related claims used on packaged Australian foods – implications for regulation. *Asia Pac J Clin Nutr* **12**, 138–150.
19. McMahon C (1996) Will pending health claims regulations motivate consumers to change dietary practices? *J Nutr Educ* **28**, 254–256.
20. Grunert K & Wills J (2007) A review of European research on consumer response to nutrition information on food labels. *J Public Health* **15**, 385–399.
21. Hooker NH & Teratanavat R (2008) Dissecting qualified health claims: evidence from experimental studies. *Crit Rev Food Sci Nutr* **48**, 160–176.
22. Leathwood PD, Richardson DP, Strater P *et al.* (2007) Consumer understanding of nutrition and health claims: sources of evidence. *Br J Nutr* **98**, 474–484.
23. Donovan Research Marketing and Communications (2001) *Food Labelling Issues – Consumer 16 Qualitative Research*. Canberra: ANZFA.
24. Rayner M, Boaz A & Higginson C (2001) Consumer use of health-related endorsements on food labels in the United Kingdom and Australia. *J Nutr Educ* **33**, 24–30.
25. Cowburn G & Stockley L (2005) Consumer understanding and use of nutrition labelling: a systematic review. *Public Health Nutr* **8**, 21–28.
26. Ni Mhurchu C & Gorton D (2007) Nutrition labels and claims in New Zealand and Australia: a review of use and understanding. *Aust N Z J Public Health* **31**, 105–112.
27. Australian Chronic Disease Prevention Alliance (2009) *Front of Pack Labeling: An Agreed Public Health Position*. Sydney: ACDPA.
28. Feunekes GJJ, Gortemaker IA, Willems AA *et al.* (2008) Front-of-pack nutrition labelling: testing effectiveness of different nutrition labelling formats front-of-pack in four European countries. *Appetite* **50**, 57–70.
29. Scott V & Worsley AF (1994) Ticks, claims, tables and food groups: a comparison for nutrition labelling. *Health Promot Int* **9**, 27–37.
30. Williams P (2005) Consumer understanding and use of health claims for foods. *Nutr Rev* **63**, 256–264.
31. McLean R, Hoek J & Hedderley D (2012) Effects of alternative label formats on choice of high- and low-sodium products in a New Zealand population sample. *Public Health Nutr* **15**, 783–791.
32. Jordan Lin C-T, Lee J-Y & Yen ST (2004) Do dietary intakes affect search for nutrient information on food labels? *Soc Sci Med* **59**, 1955–1967.
33. National Heart Foundation of Australia (2009) *Heart Foundation Tick: Two Decades of Helping Australians Choose Healthier Foods*. Melbourne: NHFA.
34. Lahti-Koski M, Helakorpi S, Olli M *et al.* (2012) Awareness and use of the Heart Symbol by Finnish consumers. *Public Health Nutr* **15**, 476–482.
35. Reid RD, Slovincic D'Angelo ME, Dombrow CA *et al.* (2004) The Heart and Stroke Foundation of Canada's Health Check Food Information Program. *Can J Public Health* **95**, 146–150.
36. National Heart Foundation of Australia (2011) *Tick Consumer Research – 2010*. Canberra: NHFA.
37. Young I & Swinburn B (2002) Impact of the Pick the Tick food information programme on the salt content of food in New Zealand. *Health Promot Int* **17**, 13–19.
38. Williams P, McMahon A & Boustead R (2003) A case study of sodium reduction in breakfast cereals and the impact of the Pick the Tick food information program in Australia. *Health Promot Int* **18**, 51–56.
39. Department of Health and Ageing & National Health and Medical Research Council (2005) *Food for Health: Dietary Guidelines for Australians, A Guide to Healthy Eating*. Canberra: DOHA and NHMRC.
40. Australian Institute of Health and Welfare (2010) *Australia's Health 2010*. Canberra: AIHW.
41. Greenland S, Schwartzbaum JA & Finkle WD (2000) Problems due to small samples and sparse data in conditional logistic regression analysis. *Am J Epidemiol* **151**, 531–539.
42. Scheltens T, Beulens JW, Verschuren WMM *et al.* (2010) Awareness of hypertension: will it bring about a healthy lifestyle? *J Hum Hypertens* **24**, 561–567.
43. Australian Institute of Health and Welfare (2011) *The Health of Australia's Males. Catalogue* no. PHE 141. Canberra: AIHW.
44. Santosh J & Crampton P (2009) Gender differences in general practice utilisation in New Zealand. *J Prim Health Care* **1**, 261–269.
45. Smith J, Braunack-Mayer A, Wittert G *et al.* (2008) 'It's sort of like being a detective': understanding how Australian men self-monitor their health prior to seeking help. *BMC Health Serv Res* **8**, 56.
46. Australian Institute of Health and Welfare (2008) *Rural, Regional and Remote Health: Indicators of Health Status and Determinants of Health. Catalogue* no. PHE 97. Canberra: AIHW.
47. Axelsson R & Axelsson SB (2006) Integration and collaboration in public health – a conceptual framework. *Int J Health Plann Manage* **21**, 75–88.
48. Pray L & Pillsbury L (2012) *Building Public-Private Partnerships in Food and Nutrition: Workshop Summary*. Washington, DC: National Academy of Sciences.
49. Australian Bureau of Statistics (2009) *Household Use of Information Technology*. Canberra: ABS.
50. National Heart Foundation of Australia (2012) Front of Pack Labelling. <http://www.heartfoundation.org.au/information-for-professionals/food-professionals/Pages/front-pack-labelling.aspx>