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## Research report

## Interpretive front-of-pack nutrition labels. Comparing competing recommendations ☆



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## ABSTRACT

Many stakeholders support introducing an interpretive front-of-pack (FOP) nutrition label, but disagree over the form it should take. In late 2012, an expert working group established by the New Zealand government recommended the adoption of an untested summary rating system: a Star label. This study used a best–worst scaling choice experiment to estimate how labels featuring the new Star rating, the Multiple Traffic Light (MTL), Daily Intake Guide (DIG), and a no-FOP control affected consumers' choice behaviours and product perceptions. Nutrient-content and health claims were included in the design. We also assessed whether respondents who used more or less information during the choice tasks differed in their selection patterns. Overall, while respondents made broadly similar choices with respect to the MTL and Star labels, the MTL format had a significantly greater impact on depressing preference as a food's nutritional profile became less healthy. Health claims increased rankings of less nutritious options, though this effect was less pronounced when the products featured an MTL. Further, respondents were best able to differentiate products' healthiness with MTL labels. The proposed summary Stars system had less effect on choice patterns than an MTL label and our findings highlight the need for policy makers to ensure that decisions to introduce FOP labels are underpinned by robust research evidence. These results suggest that the proposed summary Stars system will have less effect on shifting food choice patterns than interpretive FOP nutrition label featuring traffic light ratings.

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## Introduction

As in other developed countries, energy-dense, nutrient poor diets are a significant cause of New Zealand's high rates of obesity and non-communicable diseases (Ministry of Health, 2012). Obesity-related diseases are forecast to become the leading cause of morbidity and mortality by 2016, supplanting even disease caused by tobacco use (Ministry of Health, 2013). Suggestions that more effective nutrition labels could mitigate unhealthy dietary patterns are not new; several countries made detailed nutrition facts labels mandatory in the belief that these would promote healthier food choices (Hawkes, 2004). However, the gap between having access to nutrition information about foods and consumers' willingness

or ability to act on that information is increasingly evident (Barker, Lawrence, Robinson, & Baird, 2012).

A Nutrition Information Panel (NIP) became compulsory on the majority of packaged foods in Australia and New Zealand in 2002. However, following its introduction, research revealed that consumers struggle to use the NIP (Gorton, Ni Mhurchu, Chen, & Dixon, 2009; Ni Mhurchu & Gorton, 2007) and this nutrition label is not achieving the policy goals of facilitating healthy choices and lowering health risks (Rumble et al., 2003). The research evidence attributes this failure to the complexity of the information presented and its obscured location on the back or side of food packages (Graham & Jeffery, 2011; Levy, Mathews, Stephenson, Tenney, & Schucker, 1985; Maubach & Hoek, 2010; Maubach, Hoek, & McCreanor, 2009). Despite general agreement that a well-designed front-of-pack (FOP) nutrition label could help consumers pick healthier products, public health researchers and food industry stakeholders dispute the format such a label should take.

In 2011, an expert panel charged with independently reviewing food policy recommended the voluntary introduction of 'interpretive' labels and endorsed the Multiple Traffic Light (MTL) format (Blewett, Goddard, Pettigrew, Reynolds, & Yeatman, 2011). However, the forum of Ministers of Health declined to implement this recommendation, arguing that there was insufficient evidence to do so (Legislative and Governance Forum on Food Regulation, 2012).

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Although the Australian and New Zealand governments cooperate on food labelling policy through Food Standards Australia New Zealand (FSANZ), each country subsequently initiated separate plans of action to work with selected local industry representatives and academics.

In late 2012, the government-appointed New Zealand panel prescribed a set of principles to guide the development of a new interpretive FOP nutrition label (Reid et al., 2012). These suggested providing a holistic summary rating for the whole food (rather than individual nutrients) and awarding positive marks for increasing healthiness (such as 'stars' or 'ticks', starting from a zero base) according to the foods' score, based upon the FSANZ Nutrient Profiling Scoring Criteria (NPSC). The NPSC is based on a nutrition profiling system originally created for the regulation of food marketing to children (Rayner, Scarborough, & Kaur, 2013), and was first introduced to the local regulatory environment to determine whether foods were eligible to carry health claims (Food Standards Australia New Zealand, 2013).

Despite rejecting the MTL label on the grounds that it was not sufficiently supported by research evidence, the proposed new 'positive marks' label guidelines lack a substantive evidence base and emerging research suggests that interpretation of stars is strongly influenced by the anchors used (Graham & Mohr, 2014). By contrast, several studies analysing the effect of traffic light labels on consumers' perceptions and behaviour have now been conducted. Recent reviews have generally found that these are more effective than other label formats (Hawley et al., 2013), including when compared with summary score schemes as recommended to the NZ government (Hersey, Wohlgenant, Arsenault, Kosa, & Muth, 2013).

However, despite the growing evidence base, research into which FOP format is most helpful to consumers is not yet conclusive. Although many experimental and survey research reports conclude that consumers' decision making improves with MTLs, two recent store-based experiments in the United Kingdom and Australia failed to find a sales effect after introducing MTLs (Sacks, Rayner, & Swinburn, 2009; Sacks, Tikellis, Millar, & Swinburn, 2011), which may have dissuaded regulators. However, only a small proportion of available brands carried MTLs in these studies, which limits consumers' ability to inform category choices. In contrast, where interpretive labels are made widely available, shifts in purchasing patterns are observed. Two early intervention studies conducted in the 1980s that highlighted options low in sodium, calories, fat and cholesterol via shelf-tags changed shoppers' behaviour as sales volumes increased for items with more positively flagged nutrients (Levy et al., 1985; Schucker, Levy, Tenney, & Mathews, 1992). More recently, the 'Guiding Stars' shelf-tag system used by the US grocery retailer Hannaford has reportedly shifted shoppers' purchases towards items with more stars (Sutherland, Kaley, & Fischer, 2010). As noted above, consumers' perceptions may depend on whether the stars system uses a zero-star or one-star anchor to identify products with poorer nutrition profiles.

The different evidentiary standards applied to the MTL and proposed new summary label make it crucial that researchers compare labels developed using the new principles with the MTL and existing industry-developed, non-interpretive Daily Intake Guide (DIG). A recent Australian survey assessed consumers' ability to identify the healthier option in repeated paired-comparison tasks with eight FOP label formats (Watson et al., 2014). The study compared nine label types, including versions of the MTL and DIG as well as a nutrient-based stars label recommended by the US Institute of Medicine (IOM) (Wartella, Lichtenstein, Yaktine, & Nathan, 2012). Watson et al. (2014) found that consumers were as likely to correctly identify the healthier choice after viewing the DIG and MTL formats, but were slightly less accurate when using the IOM stars format. While these results provide some evidence about consumers' ability to

assess healthiness using these labels, effects on choice behaviour remain unclear.

New regulations permitting health claims mean consumers are beginning to encounter more front-of-pack information about nutrition and health (Food Standards Australia New Zealand, 2013), which in turn may interact with the FOP label. Currently, evidence of how consumers use product claims varies; some researchers report no discernible effects or that consumers use nutrition information to assess claims (Ford, Hastak, Mitra, & Ringold, 1996), while others find that claims are associated with misleading impressions (Hasler, 2008; van Trijp & van der Lans, 2007; Williams, 2005). As marketers view health claims for their "potential to revolutionise food advertising and offer new and increased revenue streams" (Wiggs & Irwin, 2004), it is important that any FOP label adopted will help consumers acquire an accurate overall impression.

These fundamental changes to the regulatory environment combine to create an urgent need for consumer research that informs policy making. This research uses a well-established experimental method to estimate the main and interaction effects of FOP label formats and product claims on stated preferences.

### *Systematic–heuristic decision making*

In deciding whether to mandate any label format, policy makers must appreciate how consumers make food choices so that their recommendations recognise the low-involvement nature of grocery shopping. As summarised by Kahneman (2011), dual-process theories of information processing posit that people evaluate information in two distinct ways. 'System 1' thinking is fast, relying on easily processed or obvious sources of information such as heuristics, instincts and emotions. 'System 2' is slow, and involves logic, deliberation and greater volumes of information. Recent research confirms that fast thinking is the norm for most aspects of daily life (Kahneman, 2011). Thus, despite the widely held view of consumers as information-seeking, rational agents, they are generally 'cognitive misers' who evaluate just enough information to give them confidence they can make a satisfactory decision (Wood, 2000).

Theoretically, this evidence suggests that FOP labels amenable to quick processing with little conscious effort are more likely to influence consumers' decisions. The current NIP labels require high levels of cognition to process; consumers must actively locate and interpret the numerical facts, a feat requiring both nutritional knowledge and numeracy skills (as well as good eye-sight). Though the industry-endorsed DIG labels are more visually accessible and present per-serve information in the context of daily nutrient needs, these too require knowledge and numeracy to interpret and use.

Conversely, interpretive formats such as the MTL and Star labels are more easily reviewed with little thought because they present pre-processed information using familiar heuristics. Research in the human factors and ergonomics disciplines found that colours have strong effects on decisions because they are easily processed (Williams & Noyes, 2007). Likewise, people are familiar with star ratings from other consumption domains, such as appliances and accommodation, and recognise that these provide readily understood summary information. However, because star ratings are limited by the fixed range of potential scores along a single dimension, they offer potentially less discriminative power than MTL labels, which offer three levels of information for four different variables.

Product claims about nutritional composition are typically easily processed, and consumers apparently prioritise written information over numbers when these conflict (Viswanathan, 1996). This evidence has led to concern that claims may lead consumers to overlook products' other, less healthful attributes, particularly if information about these is presented in a numeric format (Nestle & Ludwig, 2010).

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