

Research report

You eat what you are: Modern health worries and the acceptance of natural and synthetic additives in functional foods

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Abstract

There is an increasing array of functional foods available that are designed to confer health benefits. However, individuals' worries about new technology and modernity may influence the acceptance of these products. In this study, we investigated how modern health worries influence attitudes and decisions about functional foods. We asked participants ($n = 390$) to rate pictures of products with either added vitamins or added scientific compounds. Each product shown purported to have one of three possible targeted effects: to reduce the likelihood of a disease, to reduce a risk factor associated with a disease, or to improve personal appearance. We found levels of modern health worries to be significantly associated with participants' reports of organic food consumption and presence of food allergies. Modern health worries were also significantly related to a preference for foods with natural as opposed to synthetic additives. Participants with higher levels of modern health worries had a greater acceptance of functional foods designed to reduce the likelihood of disease compared to participants with low modern health worries. Overall, the results suggested that modern health worries are an important psychological factor to consider with regards to attitudes toward functional foods.

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Introduction

The concept of functional foods can be traced back to Japanese initiatives in the 1980s sparked by government policies to improve health (Arai, 2002). Put simply, functional foods are foods that are part of a normal diet which have been fortified or enriched to provide additional health-promoting benefits in conjunction with normal nutritive properties (Diplock et al., 1999; Hasler, 2002). Functional foods can be conceptualised as having two primary effects on health: the enhancement of physiological function and the reduction of disease risk (Verschuren, 2002).

Recently, there has been an increased interest from consumers towards functional foods. A US survey on consumer attitudes towards functional foods conducted by the International Food Information Council indicated high

consumer interest in foods with health-promoting benefits: a total of 93% of consumers surveyed believed that some foods, on top of their innate nutritive value, imparted additional health benefits (International Food Information Council, 2002). Increasing consumer interest has consequently seen a developing research base with regard to consumer attitudes towards functional foods (e.g. Bech-Larsen & Grunert, 2003; Gilbert, 2000; Huutilainen, Seppälä, Pirttilä-Backman, & Tuorila, 2006; Urala & Lähteenmäki, 2003). Overall, it seems, functional foods are providing increasing choices to consumers for addressing their health concerns, and consumers in turn are becoming increasingly discerning about such choices.

Despite the burgeoning research on functional foods, at present little is known about which psychosocial factors have an impact on consumers' attitudes towards functional foods. One study found that perceived reward from using functional foods and confidence in functional foods seemed to be the most crucial factors in consumers' willingness to use such products (Urala & Lähteenmäki, 2004). Another study looking at the acceptance of functional foods showed

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that belief in the health benefits of functional foods was the main determinant of acceptance (Verbeke, 2005).

A psychological factor that may influence the acceptance of functional foods is individuals' worries concerning the impact that aspects of modern life can have on health (Barsky, 1988; Petrie et al., 2001). Anxieties about environmental and technological changes affecting personal health are reflected in worries about features of modernity such as mobile phones, high-tension power lines and vaccination programmes (Petrie & Wessely, 2002). These worries are also associated with concerns about food, such as pesticide residue, genetic modification, as well as hormones and additives in food. Modern health worries have been found to influence symptom reporting and the rejection of traditional medical treatment in favour of alternative or natural therapies (Kaptein et al., 2005; Petrie et al., 2001, 2005).

A recent example of how individuals' worries about modernity may influence food choices is the rising consumer interest in bottled water. Bottled water has become the world's fastest growing drink. It is seen as a natural and pure product—a readily available antidote to what the consumer sees as being wrong with modernity and bad for their health. In a similar process to functional foods, bottled water has also become an “aquaceutical” in instances where it is fortified with additives and produced to improve health using special processes (Petrie & Wessely, 2004).

In the current study, we investigated how modern health worries influence attitudes and decisions about functional foods in the context of products with either added vitamins or scientific compounds. These products were designed to either reduce the likelihood of a disease, reduce a risk factor associated with a disease, or improve personal appearance. We hypothesized that individuals who had higher levels of modern health worries would be less likely to choose any product with added scientific compounds as opposed to products with added vitamins, which are likely to be perceived as “natural” ingredients. We also hypothesized that high modern health worries would be associated with a preference for functional foods that either prevented disease or reduced a disease risk factor rather than products that improved appearance.

Method

Participants

The study consisted of 390 medical students from The University of Auckland, New Zealand. The participants were predominantly in their first year of studies (57%), but also included second-year (25%) and third-year (18%) students. Ages ranged from 17 to 48 ($M = 20.8$, $SD = 4.3$). Students identified themselves as either New Zealand European (39%), Asian (27%), Indian (12%), Pacific Islander (6%), Maori (4%), or of other ethnicities (12%).

The sample consisted of predominantly female students (67%).

Procedure and instruments

With informed consent and Auckland University Ethics Committee approval, we asked participants, during their normal lecture times, to complete an anonymous questionnaire comprising the following scales and items.

Modern Health Worries (MHW) Scale: We used the MHW Scale developed by Petrie et al. (2001) to investigate the extent to which students were worried about particular aspects of modern life affecting their health. The measure comprises 27 items scored on a five-point scale, ranging from “no concern” to “extreme concern”. Scores on all items were then summed to obtain a total modern health worries score, with higher scores indicating more concern. This scale has been found to have high levels of internal reliability, with a reported Cronbach's alpha of 0.94 (Petrie et al., 2001).

Food-related behaviour: Participants were asked to report their use of vitamins or supplements and the use of organic food in their diet on a five-point scale from “never” to “every day”. Participants were also asked to report whether they suffered from any food intolerance or food allergies.

Health ratings. We asked participants whether they had any family history of heart disease. As well as this, we asked participants to rate their health on a five-point scale from “very poor” to “excellent”. We also collected participants' perceived risk of heart disease by asking the following question: “Compared to the average person, how likely do you think you will suffer from heart disease during your lifetime?” This was rated on a five-point scale from “much less likely than others” to “much more likely than others”.

Preference for different types of additives: We used pictures of yoghurt or margarine products presented with either added “vitamins” or “scientific compounds” (see Fig. 1). Three different health outcomes were presented—namely, reducing disease (“reduces heart disease”) reducing the risk factor for a disease (“reduces cholesterol”), and enhancing appearance (“for clearer, healthier skin”). The 12 possible combinations were shown in a random order within each questionnaire, and participants were asked to rate these products on their attractiveness, credibility and likelihood of use on a seven-point scale ranging from “not at all” to “extremely”. We created six scales from these ratings by summing the ratings for each of the relevant dimensions for both yoghurt and margarine. Thus, scales were created for preference for either vitamin or scientific compound additives as they related to reducing disease, reducing disease risk and enhancing appearance. All six scales had high levels of internal reliability (Cronbach's alphas ranged from 0.85 to 0.93).



Fig. 1. Examples of additive—effect combinations used for participant ratings.

Results

Modern health worries and food-related behaviour

The majority of the participants (62.1%), reported using organic food in their diet and 56.4% reported using vitamins or supplements. Participants eating organic food had significantly higher modern health worries than those participants not eating organic food ($M = 73.90$, $SD = 21.25$ versus $M = 66.54$, $SD = 19.81$, $t(371) = -3.34$, $p = 0.001$). Those using vitamins or supplements, however, did not differ on their levels of modern health worries ($t(370) = -1.60$, $p = 0.11$).

Thirty-one participants (7.9%) reported having food allergies and 30 (7.7%) indicated they had an intolerance to particular types of food. The group reporting food allergies had significantly higher levels of modern health worries than those not reporting food allergies ($M = 80.65$, $SD = 17.97$ vs. $M = 70.14$, $SD = 21.09$, $t(370) = 2.69$, $p = 0.008$). However, there was no difference in modern health worries between participants who reported food intolerance and those who did not ($t(370) = 0.28$, $p = 0.78$).

Modern health worries and functional food additive preferences

To test whether modern health worries scores were associated with preference for natural as opposed to synthetic food additives, we compared the correlations between modern health worries and preferences of participants for natural, versus scientific compound additives which either reduce disease, reduce a disease risk factor, or improve appearance. These correlations are presented in Table 1 and show that higher levels of modern health worries were associated with a greater preference for natural additives in foods as opposed to synthetic additives designed for the same purpose. These data show participants with higher levels of modern health worries would be significantly more likely to choose functional foods with additives seen as natural than those seen as synthetic for the purpose of reducing the likelihood of disease, reducing a disease risk or improving appearance.

Table 1

Correlations between modern health worries overall score and preference for natural vs. synthetic additives in margarine and yoghurt

Combination preference	<i>r</i>	<i>p</i>
Vitamins to reduce heart disease	0.20	0.001
Scientific compounds to reduce heart disease	0.08	0.15
Vitamins to reduce cholesterol	0.17	0.001
Synthetic compounds to reduce cholesterol	0.04	0.45
Vitamins for clearer, healthier skin	0.18	0.001
Synthetic compounds for clearer, healthier skin	0.09	0.10

To test whether modern health worries influenced the acceptance of functional foods (either with natural or synthetic additives) on the three target effects, we divided participants into high and low modern health worries groups by way of a median split. Compared to low modern health worries participants, we found participants with high levels of modern health worries had a significantly higher level of acceptance for functional foods designed to reduce the likelihood of disease ($M = 32.4$, $SD = 12.9$ vs. $M = 35.2$, $SD = 14.1$, $t(363) = -1.98$, $p = 0.048$), but not for additives designed to reduce a disease risk ($t(363) = -1.09$, $p = 0.28$) nor for additives designed to improve appearance ($t(364) = -1.53$, $p = 0.13$). Using a similar analysis, we divided participants into high and low perceived risk of heart disease groups and tested their acceptance of functional foods on the targeted effects. We found no difference between participants with high or low perceived risk of heart disease on their preference for functional foods designed to reduce the likelihood of disease ($t(377) = -0.54$, $p = 0.59$), reduce a disease risk ($t(376) = -0.60$, $p = 0.95$), or improve appearance ($t(378) = 1.14$, $p = 0.25$). This suggests that modern health worries influence the acceptance of functional foods more than the perceived risk of illness.

Discussion

In this study, we found modern health worries to influence the preference for the type of additive used in

functional foods. Higher modern health worries were associated with a stronger preference for functional foods with added natural vitamins as opposed to synthetic compounds. We also found that people with high modern health worries were more likely to choose functional foods with disease-preventing properties than either risk-reducing or appearance-enhancing properties. The preference for natural products appears to be a more important consideration for individuals with high levels of modern health worries than the targeted effect of the product. We also found that modern health worries were significantly associated with a higher use of organic foods and food allergies. This last point supports evidence found by Lind et al. (2005), in which patients with subjective food hypersensitivity were significantly more concerned with modern health worries such as additives in food as well as genetically modified food, when compared to healthy controls.

The present study offers interesting psychological insights into the acceptance of functional foods. Emphasising the “natural” aspects of the additive as well as the disease-preventing properties of the food itself seems to be of most importance when predicting acceptance of functional foods for individuals with high modern health worries. These findings are particularly pertinent when set within the context of the burgeoning rise of *healthism*—a socio-cultural phenomenon characterised by increased awareness of health, interest in food supplements and mistrust of all things scientific (Greenhalgh & Wessely, 2004). Indeed, if some functional foods are aimed at individuals clearly positioned within the healthism culture, an apparent tension becomes evident: functional foods may ostensibly address the health concerns of such consumers, but, by their very nature, functional foods would also appear to be a contradiction to some of the central tenets of healthism itself. Further psychological research could focus on how this apparent tension is understood by consumers and what impact it may have on attitudes towards and acceptance of functional foods with artificial additives. Indeed, if the bottled-water-as-an-aquaceutical phenomenon is anything to go by (Petrie & Wessely, 2004), we may expect to uncover yet another example of how the paradox of health is played out in modern life (Barsky, 1988).

Overall, the appeal of functional foods is that they help to protect health or manage a specific health problem in a convenient way. Persuading the public to adopt more functional foods in their diet rests on a better understanding of the factors that make such food choices more appealing. The current study suggests that information highlighting lowered disease risk may be more effective in influencing the purchase of functional foods than information stressing the reduction of a specific risk factor for an illness. Also, understanding risk perceptions and concerns about personal health status, processing technologies and modern scientific innovations may shed more light on consumer choices in relation to functional foods (Frewer, Scholderer, & Lambert, 2003). Further research is also

needed to understand more clearly the factors and boundaries that influence the perceptions of additives being “natural” as opposed to “synthetic” and the preference for functional foods in groups of the population that have identified higher risk profiles such as those with raised cholesterol.

It should be noted that the study is limited by the cross-sectional design, which means causal inferences about the relationship between modern health worries and attitudes towards functional foods cannot be made. The participants were also drawn from a university medical student population, and their responses may not be representative of a broader population sample, particularly in regard to their risks of illness. Bearing these limitations in mind, the present study points to the relevance that modern health worries have in relation to the acceptance of functional foods.

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