Understanding consumers’ perceptions of functional ingredients: Studies of selenium and protein

David N. COX
Commonwealth Scientific and Industrial Research Organisation (CSIRO) Human Nutrition, Adelaide BC, South Australia, Australia

Abstract
Consumer research provides important information on perceptions that have relevance for nutritional guidance and the development of the food supply. The National Centre for Excellence in Functional Foods supported research projects in consumer understanding of selenium-enriched foods and potential drivers of consumption of such foods. Second, research was undertaken on consumer understanding of the benefits of high-protein foods for weight control. This paper briefly outlines the projects and comments on the findings. The selenium study found little knowledge of the relationship between particular nutrients and particular health outcomes. While promoting information about the substantiation of benefit claims and highlighting vulnerability may increase perceived ‘importance of Se enriched foods’, confidence and ability are likely to drive consumption; therefore, efforts to facilitate ease of consumption will be required. The protein research found a suggestion that participants possessed ‘attribute knowledge’ but not ‘consequence knowledge’ of high-protein foods, indicating that there is incomplete knowledge or a belief that other factors may impact upon the weight control ability. There are implications for better communication strategies, so that consumers can make cognitive decisions to consume high-protein diets with subsequent improvement in sustained use.

Key words: consumer perception, enriched, health, ingredient, protein, selenium.

INTRODUCTION
Understanding of functional foods will significantly influence whether consumers accept the foods themselves and how they interpret the benefit from their consumption. This has implications for the development of new foods as well as regulatory systems and guidance given by health professionals (see Tapsell LC, this supplement). Two areas in which the National Centre for Excellence in Functional Foods supported consumer research related to perceptions of selenium-enriched foods and of the functionality of protein in providing health benefits. One of these is already published,¹ and the other is unpublished (in preparation).² This paper reviews these studies and discusses the implications for the development of functional foods.

METHODS
The designs of the studies are briefly described below. Results are presented as available, based on publication status. Main outcomes are summarised as appropriate:

D.N. Cox, PhD, RPHNtur, Research Scientist
Correspondence: D.N. Cox, Commonwealth Scientific and Industrial Research Organisation (CSIRO) Human Nutrition, PO Box 10041, Adelaide BC, SA 5000, Australia. Email: david.cox@csiro.au

results of the published study are reported and those of the unpublished study summarised in abstract form. Implications for innovation in functional foods are discussed.

RESULTS
Consumer perceptions of selenium-enriched foods and motivations to consume selenium-enriched foods¹

The present study used a cross-sectional survey methodology. Consumers’ knowledge of antioxidants, minerals and selenium (Se), their relationship to disease risk reduction, preferences for increasing Se intakes and motivations to consume Se-enriched foods to reduce the risk of some cancers were measured using two separate questionnaires: (i) ‘knowledge’ (n = 62) and (ii) ‘preferences and motivations’ (n = 212). The two groups of adults, recruited and interviewed at a domestic airport lounge, had similar socio-demographic characteristics and tended to be of high socioeconomic status.

From the first questionnaire (n = 62), it was revealed that knowledge of antioxidants and their role in disease prevention was generally poor and Se as an antioxidant, unknown;
however, associations were made between antioxidants and foods. Se was not recognised as a mineral. As a preface to the second questionnaire (n = 212), information on the health value of Se (reducing cancer risk), possible deficits and options for increasing intakes was provided, hence responses are relative to this ‘knowledge’. There were favourable attitudes towards Se enrichment of foods, particularly biofortification (Se enrichment of soils) above enrichment during manufacturing, or supplements. There was a preference for bread and cereals and a significantly lower (P < 0.05) preference for dairy products as the food vehicle. Dietary supplement users (34%) were significantly more favourable towards Se enrichment of foods generally. Multiple regression analysis applied to variables within protection motivation theory3 found that the ‘importance of consuming Se enriched foods’ was predicted by (standardised beta weights, β): product efficacy (β 0.35), severity/fear of cancer (β 0.19), self-efficacy (β 0.16) and vulnerability to cancer (β 0.15; all P < 0.01; R² = 0.35). However, when the dependent variable was product-specific (likelihood to consume Se-enriched bread, dairy, etc.), the main predictor was self-efficacy (β 0.70–0.86; P < 0.001; R² = 0.55–0.76), with vulnerability an additional significant predictor for some products. In other words, almost one standard deviation in intention-to-consume scores could be accounted for by the significant predictors in the model.

Consumer perceptions of high-protein foods2

The starting-point work on this project was Cacioppo, Petty and Feng Kao’s construct ‘need for cognition’,4 which measures how differences in motivation to engage in purposeful cognitive thinking may influence decision-making. Defined as ‘a stable individual difference in people’s tendency to engage in and enjoy effortful cognitive activity’, the concept of the need for cognition aims to differentiate those who purposefully seek out, gather and scrutinize information when making decisions, who also tend to prefer tasks requiring greater cognitive effort (high need for cognition), from those tending to prefer tasks requiring less cognitive effort who tend to rely on judgemental heuristics, social comparisons and opinions of credible others when making decisions. Given this model, the degree to which individuals are likely to seek out, gather and scrutinize information regarding the functional benefits of high-protein foods may vary as a function of an underlying intrinsic motivation to engage in cognitively demanding tasks.

Such underlying decision-making frameworks implicitly underlie Wansink et al.’s Hierarchy of Nutritional Knowledge model,5 which was designed for understanding the adoption (consumption) of functional foods. According to the model, those having no knowledge or only attribute-related knowledge of a particular functional food are unlikely to purchase or consume it, while those making the connection between a food’s attributes and the personal consequences (benefits) of consuming it are more likely to purchase and consume it.

Thus, the objective of the research was to elicit ‘attribute’ and ‘consequence’ knowledge of high-protein foods. One thousand individuals were randomly chosen from the Adelaide telephone directory and invited to participate if they were current or past dieters. Three hundred and ninety were ineligible and 334 agreed to participate (the remainder were refusals or un-contactable, 10%). Volunteers were sent a questionnaire which included unprompted questions on general knowledge of protein, unprompted questions on knowledge of protein in controlling weight and sought rated responses regarding usefulness of protein for the functions of ‘satiety’, ‘helps me eats less’, ‘controls hunger’ and ‘weight control’ (among 15 distracter items). We hypothesised that there may be variation in knowledge according to ‘need for cognition’ scores, socio-demographics and weight control behaviour.

Participants (n = 226) comprised of 42% men and 58% women, of whom, by self-report of weights and heights, 43% were deemed to be overweight and 24% obese. Of the 34% actively dieting, 42% (15% of total) reported following a high-protein diet. Further details of the results are in preparation for publication and an abstract version is summarised here. Unprompted knowledge of protein mostly comprised growth, muscle repair and development functions. When focused upon weight control, knowledge of protein in respect to satiety was modest, although ratings for ‘satiety’, ‘helps me eat less’ and ‘controls hunger’ were generally high. However, ‘weight control’ was rated low, suggesting a disconnection between the function of satiety and the consequence of weight control. Need for cognition was not found to be predictive probably because of, generally, a very low level of knowledge (i.e. little variation in the dependent variable). The only consistent predictor of knowledge was sex, with women generally more knowledgeable.

DISCUSSION

The selenium study confirmed poor knowledge of the relationship between particular nutrients and particular health outcomes reported 15 years earlier.6 Once informed, participants showed clear favourability towards biofortification relative to other options, and clear preferences for cereal products. Supplement use was a strong predictor of acceptance and, given that it is known that the supplement users are generally more favourable to protecting their health than others, these may be the first adopters of novel functional foods. However, there is a need for more research into consumer issues of dose control and convenience. Differences in predictors vary with the dependent variable and, while a range of issues were predictive of the ‘importance of selenium enriched foods’, self-efficacy was the dominant predictor when ‘intentions to consume specific foods’ are the dependent variables. While promoting information about the substantiation of benefit claims and highlighting vulnerability may increase perceived ‘importance of Se enriched foods’, confidence and ability are likely to drive consumption; therefore, efforts to facilitate ease of consumption will be required.
In the protein research, we found a suggestion that participants possessed ‘attribute knowledge’ but not ‘consequence knowledge’ of high-protein foods, indicating that there is incomplete knowledge. Alternatively, participants may have believed that other factors may impact upon their ability to control weight. The latter interpretation suggests a need for more research to assess what people adopting weight loss practices deem to be the most effective. The disconnection between attribute and consequence knowledge necessitates better communication strategies, so that consumers can make cognitive decisions to consume high-protein diets with subsequent improvement in sustained use.

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CONFLICT OF INTEREST

No conflict of interest was declared by D.N. Cox.

REFERENCES
