"Pick the Tick"

The Impact of Health Endorsements on Consumers' Food Choices

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Abstract

To determine the efficiency of health-related endorsements in influencing consumer choice we report findings from two separate, unique discrete choice experiments (DCEs) involving fresh packaged beef steaks and seafood. In addition to quality and production-related attributes, the beef and seafood products also displayed a health endorsement: the Australian National Heart Foundation "Pick the Tick" certification. Another, more recently introduced health claim, "2 Serves a Week" was also included in the seafood experiment. Consumer awareness of the "Pick the Tick" certification was higher than any other extrinsic claim considered in the experiments. Furthermore, in both experiments, "Pick the Tick" had the highest impact and value relative to other extrinsic product cues, however, its impact on consumers' choices was relatively low compared to intrinsic product characteristics and price. In both experiments, two segments of consumers: health-concerned consumers and premium-oriented consumers were more likely to value and use the "Pick the Tick" health-endorsement. The insignificance of the relatively new "2 Serves a Week" health claim in the analysis of the seafood experiment suggests that the simple addition of a food health claim alone will not impact consumer choice. Rather, food health endorsement programs require credible third-party certifiers as well as considerable investment in promotion before consumers become aware, trust and use them to guide food choices.

Keywords: health claims, food labelling, discrete choice experiment, beef, seafood, visual presentation

JEL codes: D12, I12, Q18,

1. Introduction

Internationally, numerous nutrition/health claims and food labelling programs and policies exist with the general aim of enabling consumers to make "healthier" food choices. In many countries, food manufacturers are allowed to develop private nutrition labelling schemes and make front-of-package health claims such as 'low in fat' or 'high in fibre.' While consumers are influenced by these 'voluntary' health claims, they are increasingly sceptical and suspicious about their credibility (Williams, 2005; Chan et al, 2005). Conversely, many countries have food labelling policies which mandate the inclusion of factual nutritional information "panels" on all manufactured food products. Proponents of mandatory nutrition information/fact panels contend that the information provided in the panel will enable consumers to assess the nutritional content of food products and compare products based on specific nutrients of concern. However, previous studies suggest that nutrition panel information is difficult for consumers to interpret and use (Higginson et al., 2002).

Nutrition experts, consumer advocacy groups and food industry leaders are encouraging the development of simplified front-of-package nutritional labelling schemes that complement nutrition panels, but also allow consumers to quickly compare the content of nutrients of greatest public health significance (e.g. energy, total/saturated fat, sugar, sodium, fibre). Existing and proposed 'simplified' schemes usually involve an endorsement by a reputable third-party (e.g. National Heart Foundation "Pick the Tick", proposed Smart Choices^{TM}) and a partnership between the administrating body and food industry. Food nutrient levels are tested to verify certain standards are met and these are communicated to consumers through easily interpretable certifications on the product package. Contrary to private health claims and nutrition panels, which focus on demand- side change, health endorsement programs can both assist consumers in selecting healthier food options and provide food manufacturers with incentives to develop healthier food products – potentially leading to supply *and* demand changes (Golan and Unnevehr, 2008). The impact of health endorsements on food supply has previously been confirmed (e.g. see Young and Swinburn, 2002; sodium reduction), but their actual utilisation by consumers is still questioned. The majority of previous studies are limited to measuring awareness, attitudes, self-reported usage and purchase frequency of health endorsements (overview in Ni Mhurchu and Gorton, 2007), but these constructs are only weakly related to *actual* purchase behaviour (Higginson, et al., 2002). For example, a study by Rayner et al. (2001), using word protocols of consumers 'thinking aloud' while shopping,

found a low frequency of actual food endorsement usage, which was inconsistent with their stated usage.

Visual food attributes and cues, such as certifications, can have a strong subconscious effect on consumer behaviour, but, respondents are often unable to report or verbalize their importance because they are unaware of it (Fitzsimons et al., 2002). This study uses a unique discrete choice experiment (DCE), where consumers choose food products in a *visual* shelf simulation that allows us to capture these subconscious effects (Mueller, Lockshin and Louviere, 2010). Choice based methods are known to have a high external validity and to provide valid predictions of consumers' purchases (Louviere et al., 2000). While attitudes reflect consumers' desire for information, DCEs can capture consumers' *value* and *use* of information in purchase decisions relative to other attributes.

To address the question of how efficient health-related endorsements are in influencing consumer choice we report findings from two separate DCEs involving fresh packaged beef steaks and seafood that in addition to quality and production-related attributes, also display a health endorsement: the Australian National Heart Foundation "Pick the Tick" certification. By reporting the effect of health endorsements for two different food categories, we aim to identify patterns that are replicable and can be empirically generalized.

2. Research Questions

The study aims to answer the following research questions:

1. To determine the relative awareness and penetration of "Pick the Tick" for Australian beef and seafood consumers.
2. To identify associations and beliefs consumers hold for the health endorsement "Pick the Tick".
3. To analyze the impact of the health claim "Pick the Tick" relative to price and other extrinsic and intrinsic food attributes on consumer choice.
4. To estimate the marginal willingness to pay for the health endorsement "Pick the Tick" for two different food categories: beef and seafood.
5. To identify and characterize unique consumer segments, that particularly react to food health claims.

3. Research Methods and Empirical Analysis

The DCEs were part of two large online studies of Australian beef and seafood (barramundi) consumers conducted during June and November 2009. Nationally representative samples of 1,881 (beef) and 1,092 (seafood) consumers were obtained using reputable consumer panels. Both samples are characterized in detail in Table 8.

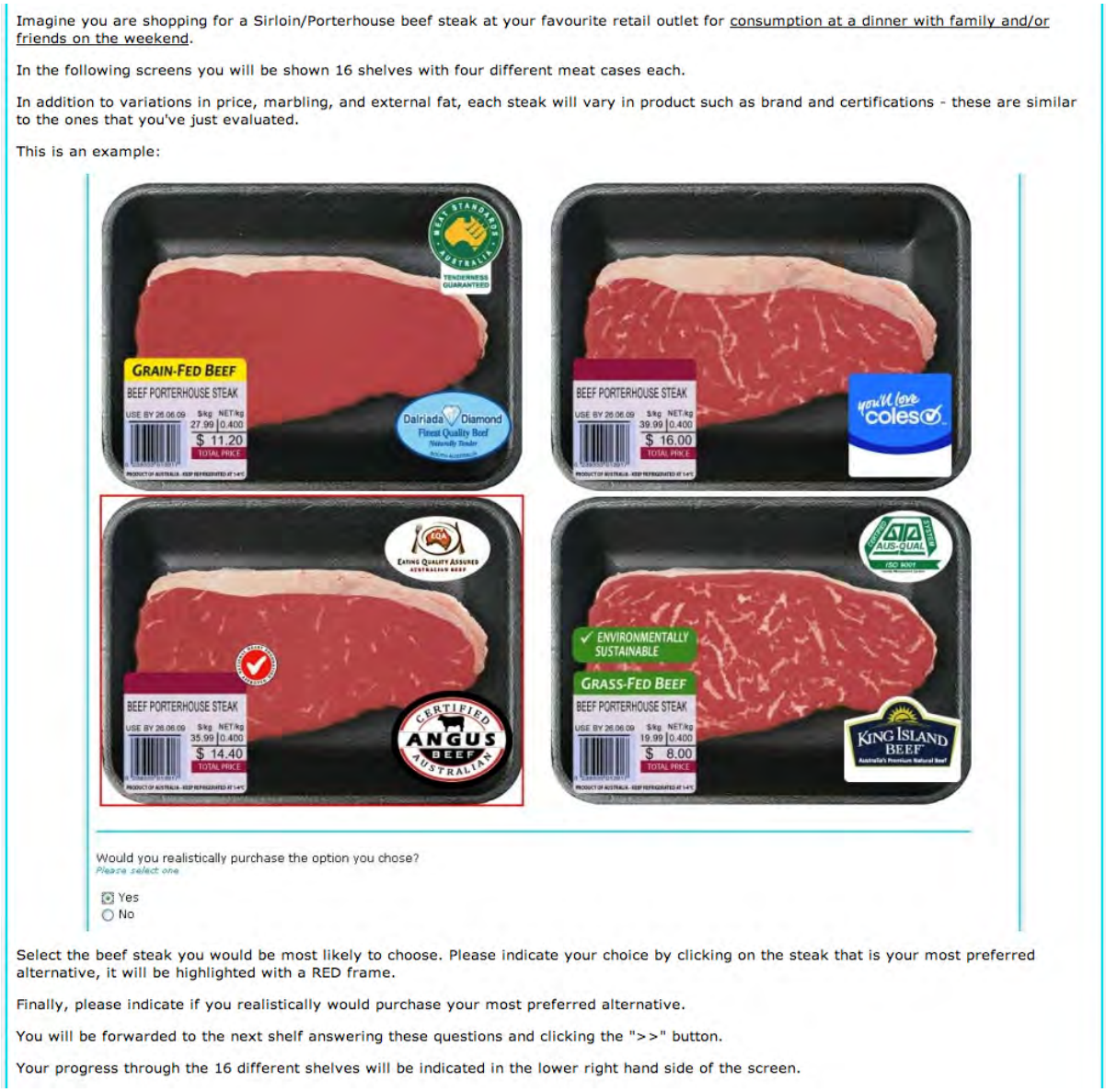

Figure 1. Example of Beef DCE Choice Set

Figure 2. Example of Seafood DCE Choice Set

Prior to completing the DCEs, respondents answered socio-demographic, beef/seafood purchase behavior, knowledge, awareness and attitudinal questions. In the DCE, consumers were asked to imagine they were purchasing a beef steak/ barramundi steak for a weekend dinner with family/friends. In each choice set respondents were shown photo-realistic presentations of the beef and seafood products as they would appear in a typical retail case or at the deli counter (see Figure 1 and Figure 2 for examples). Consumers indicated their most likely choice and if they would realistically purchase their choice. This approach prevents respondents from an easy way out, where they avoid having to make any preference statement, but allows the consideration of a status quo or no-choice option (Ryan and Skatun, 2004).

Both DCEs contained a large number of extrinsic and intrinsic attributes to avoid biased and overestimated part worth values from neglecting attributes that are important for consumer choice (Louviere and Islam, 2008). Price and other attributes and levels were chosen after

conducting a substantial literature review, consumer focus groups, and interviews with industry leaders.

The beef DCE contained a total number of eight intrinsic (marbling and fat rim) and extrinsic product attributes (for a detailed discussion of the intrinsic attributes see Umberger and Mueller, 2010). All attributes and levels are listed in Table 1. Besides price and brand, the relative importance of a number of product claims, such as quality certification, production claim, and forage, were tested as well as the impact on consumer choice of the health endorsement 'heart tick'. To represent a realistic incidence of the health endorsement in the shelf simulation, preventing it to appear too often, only one in four levels was allocated to the health claim. Beef steaks were offered in 400g retail cases.

In the Seafood DCE only extrinsic product cues were varied to examine their impact on consumer choice. All attributes and levels are provided in Table 2. The attribute packaging modeled the availability of a pre-packed 300g Barramundi fillet in a package with normal (3 days) and extended (7 days) shelf life as well as the offer as lose weight of fresh or thawed Barramundi over the deli counter.

Two different health claims were tested for Seafood, the health endorsement 'heart tick' and a more recently introduced recommendation '2 serves a week'. The later is currently used in Australia by an industry-owned corporation Seafood Experience Australia (SEA, www.seafoodpromotion.com) and is based on recommendations by the UK Food Standards Agency to meet Omega-3 requirements. The authors are not aware of information on how much funding has been used to date to promote this health claim to Australian consumers, but it is considerably less than for the 'heart tick'. Origin, sustainability claims and celebrity chef endorsements were tested as further extrinsic attributes in the seafood DCE.

The DCEs used an 8^4x4^4 (beef) and 4^7(seafood) OMEP design resulting in 64 choice sets with choice set size of four and statistical efficiency of 99.7% and 100% respectively (Street and Burgess, 2007). To avoid respondent fatigue, respondents were randomly allocated to one of four different versions of 16 choice sets.

Respondents' beef and seafood choices were analysed with a) an aggregated multinominal logit model (Louviere et al., 2000) and b) a latent class scale adjusted choice model to explore heterogeneity (Train, 2003; Mueller et al., 2010; Umberger and Mueller, 2010).

Table 1. Attributes and Levels used in the Beef Discrete Choice Experiment

	Price	Brand	Quality Certification	Production Claim	Forage Claim	Health Claim	Marbling	Fat Trim
Levels	8	8	8	8	4	4	4	4
Level 1	$15.99	Woolworths	Australian Quality (Aus Qual)	Environmentally Sustainable	Grass-Fed	Heart Tick	Void (0)	Devoid (2 mm)
Level 2	$19.99	Coles	Meat Standard Australia (MSA)	100% Hormone & Antibiotic Free	Grain-Fed	None	Level 2	5mm
Level 3	$23.99	Terra Rossa	Eating Quality Assured (EQA)	Certified Humane	None	None	Level 4	10 mm
Level 4	$27.99	King Island	Australian Beef	None	None	None	Level 6	20 mm
Level 5	$31.99	Coorong Angus Beef	None	None				
Level 6	$35.99	1824	None	None				
Level 7	$39.99	Dalriada Diamond	None	None				
Level 8	$43.99	Certified Australian Angus Beef (CAAB)	None	None				

Table 2. Attributes and Levels used in the Seafood (Barramundi) Discrete Choice Experiment

	Price	Brand	Packaging	Origin	Health Claim	Sustainability claim	Celebrity Endorsement
Levels	4	4	4	4	4	4	4
Level 1	$14.90	Woolworths	Black tray – use within 3 days of purchase	Australia with logo	Heart Tick	MSC Certified Sustainable Seafood	Masterchef
Level 2	$21.90	Good Fortune	Blue tray – use within 7 days of purchase	Australia	2 serves a week	GAA Best Aquaculture Practices Certified	None
Level 3	$28.90	John West	Deli - fresh	Indonesia	None	None	None
Level 4	$35.90	Market Pride	Deli - thawed	Vietnam	None	None	None

4. Results

4.1 Consumer awareness and penetration of claims

Research in marketing has identified salience, awareness and fitting associations as key success factors for products in general (Romaniuk and Sharp, 2004). Applying this to food claims, only extrinsic attributes which consumers are aware of and which they associate with beneficial attributes are expected to have a significant impact on consumer choice. Market penetration as a measure for previous purchase of a product or claim was identified as a second driver for short-term and medium-term purchase frequency (Baldinger and Blair, 2002; Sharp, 2010). To measure their "prompted awareness" respondents indicated if they had ever heard about or seen each of the extrinsic attributes or claims. They also were asked if they had previously purchased a product carrying any of the brands or claims used in the beef and seafood DCEs, including the health endorsement by the National Heart Foundation.

Over 94% of respondents were aware of the use of the Australian Heart Foundation Approved Tick on both beef and seafood products (Table 3). However, 86% and 58% of consumers had previously purchased beef and seafood products with the "Pick the Tick" claim, respectively. Of all claims included in the beef and seafood DCEs, the Australian Heart Foundation Approved Tick had by far the highest awareness and penetration. For beef, the Meat Standards Australian certification followed as second (25% awareness, 15% penetration) before Australian Beef (12%, 7%), ISO 9001 (4%, 2%) and Eating Quality Assured (3%, 2%). For seafood the "Pick the Tick" claim even showed a slightly higher awareness and penetration than 'Australian made' (96.1%, 50%), and outweighed all other claims by far: Masterchef recommendation (15%, 1%), GAA Best Aquaculture Certified (10%, 7%), MSC certified sustainable (8%, 5%). The second health claim '2 serves a week' had the lowest awareness and penetration of all benefit claims (6%, 3%).

Table 3. Awareness and penetration of health endorsement 'heart tick' for Australian beef and seafood consumers

	Beef (n=1,882)	**Seafood** (n=1,092)
Awareness	94.0%	96.2%
Previous purchase	86.3%	58.4%

The beef study included attitudinal questions regarding perceptions associated with a wide range of brands and certifications related to safety, production and process (credence)

attributes. The "Pick the Tick" claim had the strongest positive attitude profile of any extrinsic cue. "Pick the Tick" was associated with being a 'healthier choice' (72% of respondents), 'safer choice' (48%), 'more trustworthy' (42%), 'less risky' (40%) and 'are worth a premium' (31%). Only 20% of respondents agreed that the claim is a marketing gimmick and that products with the "Pick the Tick" claim are no different. These findings suggest that the endorsement program has been successful in creating strong health-related associations with its information and education campaigns.

4.2 Discrete Choice Experiment Results

4.2.1 Aggregated DCE models

A multinomial logit model was estimated, assuming that that there is no systematic preference heterogeneity between respondents. The "Pick the Tick" claim had a significant positive part-worth utility in both experiments.[1] The relative importance of the health endorsement for consumer choice was estimated by the partial contribution to model fit, estimating its effect size (Louviere and Islam, 2008).

Table 4. Aggregated attribute importance weightings beef DCE [i]

Attribute	Importance
Marbling	46.3%
Price	34.7%
Fat Trim	10.6%
Health Claim	0.5%
Brand	0.5%
Production Claim	0.2%
Quality Certification	0.2%
Forage Claim	0.1%

[i] Weighted average of class wise importance measured by partial contribution to model fit – LL.

Table 5. Aggregated attribute importance weightings seafood DCE [i]

Attribute	Importance
Price	51.1%
Origin	37.9%
Packaging	6.9%
Health claim	2.8%
Brand	0.8%
Sustainability	0.5%
Chef recommendation	0.0%

[i] Weighted average of class wise importance measured by partial contribution to model fit – LL.

[1] We refrained from listing detailed part worth utilities here because of space limitations.

Although the absolute importance values are not directly comparable between both experiments, it appears from Table 4 and Table 5 that the health claim is the most important extrinsic attribute for beef and the most important benefit claim for seafood. For both food categories, the relative importance of the health endorsement was considerably larger than other extrinsic attributes such as brand, quality, forage, and production certifications.

From standardizing the part-worth utility of the health endorsement by the price coefficient, the marginal willingness-to-pay (WTP) can be calculated for the aggregated model. Estimates for both experiments are given in Table 6. The fact the health claim is more important and results in a higher willingness-to-pay for seafood than for beef, can likely be attributed partially to the fact that the Barramundi fillets did not differ in any intrinsic attributes (e.g. color or firmness), increasing the predictive utility of any available extrinsic product cue (Louviere and Islam, 2008; Kardes et al., 2004). Furthermore, the beef DCE contained a larger number of attributes, potentially impacting their relative importance.

Table 6. Marginal willingness to pay for "Pick the Tick" and confidence interval

	WTP	**95% confidence interval**	
Beef DCE	A$0.93/kg	A$0.84/kg	A$1.02/kg
Seafood DCE	A$3.58/kg	A$3.32/kg	A$3.88/kg

It should be considered that WTP and preference share are two different sides of the same coin. Accordingly, the higher preference for products with health claims can be expressed in a higher marginal WTP of the preferred produce, which would result in the same share of preference. Similarly, the higher preference can be expressed in a higher preference share for the product offered at the same price. This consideration is certainly important, as the main aim of health claims should be the more likely choice of 'healthy' over 'unhealthy' products, not necessarily the higher profits companies could gain. This aspect of choice share is listed in Table 7, where the relative impact of the health endorsement by the National Heart Foundation is represented by a 10% higher choice share of the non-labeled product.

Table 7. Share of choice for health claim levels in beef and seafood DCE

	Beef DCE	**Seafood DCE**
"Pick the Tick"	54.6%	39.8%
None	45.4%	29.6%
"2 serves a week"	-	30.6%

4.2.2 Latent Class Models Considering Respondent Heterogeneity

To restrict the assumption of respondent homogeneity and to identify distinct consumer groups, which differ in the drivers of their food choices, scale adjusted latent class models were run for the beef and seafood DCE. Using the BIC-criteria in Latent Gold 4.5 syntax module, both models resulted in an optimal number of seven classes.

Beef results

For the beef DCE, Table 9 gives an overview of the attribute importance, the part-worth estimates and a brief characterization by the most important beef attribute levels for each of the classes. It appears that two segments (C7 and C3), comprising a total of about 20% of respondents, react stronger to "Pick the Tick" than the other five classes. The relative effect is strongest for C7, with 1.3% relative importance. This segment strongly prefers small amounts of external fat (78% attribute importance) and low marbling levels. Obviously this segment is averse to fat (both marbling and external fat) and appears to seriously avoid fat when making beef choices. Price and other extrinsic cues are of low importance to this segment. On the other hand, the C3 segment placed the second-highest relative importance on health endorsement (0.8%). Consumers in this segment preferred high marbling levels and medium fat trim, and associated marbling with beef tenderness. This segment was the most brand sensitive of all segments (1.3%) and also paid attention to production claims when choosing beef steaks. Both segments are very insensitive to price, partially preferring medium over lower prices, as such, no meaningful willingness-to-pay values can be calculated because the estimates would be highly biased.

The segments are characterized ex-post by their socio-demographics, awareness of the health claim as well as attitudes regarding beef. A number of significant differences across segments exist, suggesting that both segments satisfy different needs when considering health endorsements into their choice process. C7 is the oldest of all segments with average education and slightly above average income. The majority is married or live in partnership and most do not have children living at home. They perceive themselves as having average knowledge about beef. Considering their perceptions of "Pick the Tick", this segment has the highest agreement that products carrying this claim are 'a healthier choice' (74.6%), 'a safer choice' (50.3%) and 'more trustworthy' (45.1%). Interestingly, this segment shows lower than average associations with characteristics such as 'better quality' and 'more tender', suggesting that consumers have

specific health and safety related associations with this claim, giving evidence of their knowledge about the actual meaning of the endorsement. Respondents of this segment report the highest awareness (96.7%) and highest previous purchase (91.5%) of all segments.

A common characteristic of both health claim sensitive segments, C7 and C3, is that compared to the overall sample they are more likely to purchase the majority of their meat at a butcher (37% for C7 and 36% for C3). Both have higher than average concerns about antibiotics in meat and consider it important to source locally produced food products.

Segment C3 appears to have the highest income and education (41% graduate and postgraduate degree) of all consumer segments. They also have the highest subjective knowledge about beef products and are aware of the relationship between marbling and tenderness – this is also revealed by their beef choices in the DCE. These consumers do not deviate in their age from the population distribution but are slightly more likely to be single. Interestingly, this segment does not deviate from the average regarding their associations with 'Pick the Tick', their awareness and previous purchase of the claim. But 46% of consumers of this segments (compared to an average of 30%) state that they have previously purchased one of the non-distributor related brands included in the DCE. These characteristics suggest that this segment is strongly interested in premium beef products and is not really considering or even fully aware of the health aspects of "Pick the Tick".

Seafood

In the seafood experiment, two segments making up 23% of the total sample appear to place higher than average importance on the health claim (C2 and C4). Segment C2 prefers medium prices and is strongly driven by brands, the health claim and Australian-origin. The other segment C4 is more price sensitive, prefers low prices, traditionally packed trays without shelf life extending atmosphere, Australian origin and to some degree brands and the health claim. Although the experiment did not consider intrinsic Barramundi attributes, it is interesting to note that these two segments have some similarity with the segments identified for beef. One is more price sensitive, only partially reacting to extrinsic claims and the other prefers medium prices and is strongly influenced by extrinsic claims.

Looking at their post-hoc characterization, we cannot find such strong age and education differences, although C2 has a slightly higher than average income. Similar to the beef segments, both segments show the highest awareness and previous purchase of products with

'Pick the Tick', confirming their mediating role on actual choice. Although segment C2 reacts considerably stronger to the health claim, segment C4 is significantly more health concerned. It has the highest interest in finding out health benefits of different food and is concerned about mercury levels in seafood. Also, C4 has the highest level of agreement to the statement that they eat seafood because it is better for health. Both segments have the highest knowledge about the recommended dietary intake of two servings of seafood per week. While C4 feels most confident in their ability to cook seafood correctly, C2 would eat more seafood it they knew ways to cook it, suggesting slightly less experience with the product. Both segments place less importance on domestic origin of seafood, which is also reflected in the relative importance they place on this attribute in the choice experiment.

The seafood segment C4 shows strong similarities with the beef segment C7, where health concerns are the main drivers for their choice of products with "Pick the Tick" endorsement. The other two segments are similar in that consumer are more interested in medium prices premium products and are more likely to react to external product cues such as brand. The fact that C2 in the seafood experiment strongly reacts so strongly to the health claim can possibly be attributed to the fact that intrinsic product cues, such as color and structure of the fillet, did not vary in the seafood experiment. It is plausible that these consumers used external attributes to infer the missing information.

5. Conclusions and Discussion

Our results are interesting considering the plethora of competing food labels and claims and the ongoing debate regarding the need for simplistic front-of-package nutrition labeling programs backed by science and certified by reputable third-parties. The results of DCEs for two different food products – both of which are primarily sold unbranded or under retailer brands – are congruent with respect to the relative impact of the Australian National Heart Foundation health endorsement on consumer choices. Interestingly, consumer awareness for the food claim analyzed in this study was higher than any other extrinsic claim considered in the experiments. This is likely a result of long-term marketing activities of the National Heart Foundation in Australia creating the required awareness and health-related associations. Furthermore, considering all consumers, "Pick the Tick" had the highest impact and value in the choice experiments relative to other extrinsic product cues, but its impact on choices is relatively low compared to intrinsic product characteristics and price.

The impact of health endorsements relative to the other extrinsic cues considered in the beef and seafood choice experiments agrees with the relative importance of food values reported by Lusk and Briggeman (2008). Safety, nutrition, taste and price were found to be the most important food values for U.S. consumers. Values such as environment, fairness, and tradition appear to be least important to U.S. consumers. Their findings coincide with the relative impact of extrinsic and intrinsic attributes found in our study, where attributes related to environmental issues and fairness (animal welfare in this case) were largely unimportant to Australian beef and seafood consumers.

The marginal WTP for "Pick the Tick" differed between the beef and seafood experiments ($0.93 for beef and $3.58 for Barramundi). This difference could be related to category-specific differences between meat and seafood, however it is more likely that the inclusion of the intrinsic product attributes, marbling and external fat content, reduced respondent' dependence on extrinsic product cues. This assumption is strengthened by the fact that both beef segments sensitive to health claims reacted strongly to intrinsic product cues. This finding implies that products used in discrete choice experiments should vary in all their characteristics, similar to the natural variations in products which exist in the market place. If intrinsic product cues are not considered, this will likely result in an overestimation of the effect of extrinsic product cues (Umberger and Mueller, 2010).

In both DCEs, it is interesting to consider why similar segments, consisting of a) highly health concerned consumers and b) premium-oriented consumers that use extrinsic cues for product evaluation, are more likely to value and use this health-endorsement. Furthermore, it is important to note that the simple addition of a food health claim is likely not sufficient to impact consumer choice. As demonstrated by the insignificant impact of the only recently introduced seafood-specific health claim "2 serves a week", claims and food endorsements need to establish awareness and market penetration before they can have a significant impact on consumer choice. Accordingly, food health endorsement programs require credible third-party certifiers as well as considerable time and investment before consumers become aware, trust and use them to guide food choices.

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8. Appendix

Table 8. Socio-demographic characteristics of the samples compared to the Total Australian population according Australian Bureau of Statistics.

		Total Population		Beef Sample	Seafood Sample
State	NSW (inlc. ACT)	34.6%	NSW	27.2%	29.3%
	Victoria	24.9%	Victoria	19.4%	22.7%
	Queensland	19.8%	Queensland	15.3%	20.9%
	South Australia	7.6%	South Australia	25.5%	9.2%
	Western Australia	10.1%	Western Australia	9.5%	11.2%
	Tasmania	2.3%	Tasmania	1.6%	3.1%
	Northern Territories	0.7%	Northern Territories	0.4%	0.5%
			ACT*	1.2%	2.9%
Area	Capital Cities	61.9%	Metropolitan areas*	69.0%	58.6%
	Country Area	38.1%	Non-capital city*	31.0%	41.4%
Gender	Female	50.6%	Female	66.0%	55.8%
	Male	49.4%	Male	34.0%	44.2%
Age	14-24	18.0%	18-24*	6.7%	8.6%
	25-34	16.5%	25-34	19.5%	18.9%
	35-49	26.9%	35-49	33.4%	30.6%
	>50	38.6%	>50	40.4%	41.9%
Marital status	single	36.7%	Single/Div/Sep/Widow*	30.0%	37.1%
	married/ de facto	63.3%	Married/ partnership*	70.0%	62.9%
Children at home	yes	37.1%	yes	37.5%	36.2%
	no	62.9%	no	62.5%	63.8%
Number of children	1	15.5%	1	16.4%	n.a.
	2	14.1%	2	15.1%	n.a.
	3+	7.5%	3+	6.0%	n.a.
People living in HH	1-2 People in HH	40.8%	1-2 People in HH	50.2%	n.a.
	3-4 People in HH	43.0%	3-4 People in HH	38.5%	n.a.
	5+ People in HH	16.2%	5+ People in HH	11.2%	n.a.
Personal income	Under $20,000	18.8%	Under $20,000	8.6%	13.2%
(AUD)	$20,000 to $29,999	11.8%	$20,001 to $40,000*	17.2%	17.8%
	$30,000 to $49,999	25.9%	$40,001 to $60,000*	17.1%	19.9%
	$50,000 to $69,999	18.7%	$60,001 to $80,000*	17.1%	13.2%
	$70,000 or More	24.8%	$80,001 or More*	40.0%	22.2%
			refused		13.7%
Education			Some Secondary*	21.6%	16.9%
	Some Secondary	17.0%	Finished Year 12*	18.0%	20.2%
	Tech./HSC/Year 12	19.6%	Have Dip/Degree or Uni*	49.6%	48.5%
	Diploma or Degree	33.5%	Have Postgraduate Degree*	9.6%	14.4%
Employment	Full time work	39.3%	Full time work	41.8%	38.1%
	Part time work	20.6%	Part time work	21.3%	21.0%
	Not employed	40.1%	Not employed	37.0%	41.0%

*Category differs from Australian Bureau of Statistics

Table 9. Attribute importance and Estimates for health endorsement of scale-extended Latent Class choice model for Beef

	C1			C2			C3			C4			C5			C6			C7		
%	20.3%			7.4%			11.1%			14.3%			14.2%			17.2%			8.4%		
N	382			142			206			266			271			322			153		
R^2	74.0%			46.5%			35.3%			78.6%			42.9%			56.3%			46.5%		
Choice cues	Low marbling			Medium marbling, small fat rim			High marbling, medium fat rim, Lower/medium prices			Very price sensitive			Medium/higher prices, Medium marbling, Small fat rim			Lower/medium prices, Low marbling, Small fat rims			Small fat rim, Lower marbling, Lower/medium prices		
Attribute importance																					
Marbling	97%			87%			78%			1%			21%			41%			16%		
Price	2%			3%			8%			99%			67%			54%			4%		
Fat rim	1%			8%			11%			0%			9%			4%			78%		
Health claim	0.1%			0.4%			0.8%			0.0%			0.5%			0.4%			1.3%		
Brand	0.2%			0.3%			1.3%			0.0%			1.1%			0.2%			0.7%		
Quality cert.	0.0%			0.8%			0.1%			0.1%			0.3%			0.2%			0.1%		
Production c.	0.1%			0.1%			0.7%			0.1%			0.1%			0.2%			0.3%		
Forage	0.2%			0.3%			0.2%			0.0%			0.0%			0.1%			0.2%		
Part worth estimate	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**
Heart Tick	0.18	2.93	0.00	0.17	2.49	0.01	0.22	5.04	0.00	0.12	1.09	0.28	0.16	3.47	0.00	0.24	4.66	0.00	0.33	5.27	0.00
None	-0.18	-2.93	0.00	-0.17	-2.49	0.01	-0.22	-5.04	0.00	-0.12	-1.09	0.28	-0.16	-3.47	0.00	-0.24	-4.66	0.00	-0.33	-5.27	0.00

R^2= 0.546; LL =-23,622; BIC(LL) = 48,895, n = 1,881, #parameters = 219; Classification Error = 0.0834, 7 classes, 1 random class (n=139) and 2 Scale Classes

Table 10. Attribute importance and Estimates for health endorsement of scale-extended Latent Class choice model for Seafood

	C1			C2			C3			C4			C5			C6			C7		
%	207			119			185			136			197			156			81		
N	19%			11%			17%			12%			18%			14%			7%		
R^2	48%			13%			43%			41%			24%			39%			24%		
Choice cues	Very low prices, Australian origin, not thawed			Heart tick, brands, Australian origin, medium prices			Low/medium prices, Australian origin, deli-counter			Low prices, freshly packed, Australian origin, brands, heart tick			Australian, fresh deli counter, low-medium prices			Low prices, Australian, not thawed			Deli-fresh, Australian, low-medium prices		
Attribute importance																					
Price	94.5%			10.9%			49.8%			47.8%			5.1%			55.5%			4.3%		
Origin	1.6%			9.9%			47.4%			14.4%			69.8%			37.4%			20.5%		
Packaging	1.6%			3.6%			1.5%			18.4%			21.9%			5.3%			72.4%		
Brand	0.9%			34.8%			0.5%			13.2%			0.9%			0.9%			1.4%		
Health claim	0.6%			39.8%			0.5%			4.6%			0.8%			0.5%			0.2%		
Sustainability	0.4%			0.7%			0.1%			0.2%			1.3%			0.4%			1.1%		
Recommend.	0.3%			0.3%			0.2%			1.3%			0.1%			0.0%			0.1%		
Part worth estimate	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**	**beta**	**z**	**sign.**
none	-0.22	-4.55	0.00	-0.46	-8.82	0.00	-0.25	-3.92	0.00	-0.24	-2.97	0.00	-0.18	-3.79	0.00	-0.19	-2.41	0.02	-0.17	-2.19	0.03
2 serves	-0.18	-3.11	0.00	-0.47	-7.04	0.00	-0.15	-2.05	0.04	-0.19	-2.11	0.04	-0.10	-1.90	0.06	-0.29	-3.16	0.00	0.01	0.10	0.92
heart tick	0.40	6.78	0.00	0.93	13.61	0.00	0.40	5.73	0.00	0.43	4.80	0.00	0.27	5.30	0.00	0.48	5.48	0.00	0.16	1.84	0.07

R^2= 0.416; LL =-20,644; BIC(LL) = 42,232, n = 1,092, #parameters = 135; Classification Error = 0.071, 7 classes, 1 random class (n=11) and 2 Scale Classes