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Effects of media headlines on consumer preferences for food safety, quality and environmental attributes*

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In recent years, Asia has emerged as an important supplier of food to Western countries. In this study, we focus on shrimp, a major aquaculture commodity, to evaluate consumer willingness-to-pay (WTP) for enhanced food safety, use of antibiotics and eco-friendly practices used in producing shrimp in the presence of country-of-origin labelling. Specifically, this research assesses the effects of news headlines regarding product safety, as information shocks on U.S. consumer demand. Consumers were found to have a mean willingness-to-pay of $7.81 per pound of shrimp with an enhanced safety characteristic from the United States, $0.94 for the same type of shrimp from China and $2.43 for similar shrimp from Thailand. Consumers had a WTP for the absence of antibiotics in the production of U.S. shrimp of $7.31 and were only willing to pay for an eco-friendly attribute on domestically produced shrimp. Media headlines were found to have a statistically significant effect on consumer preferences and WTP for product characteristics. Food policy and international agribusiness implications of our findings are discussed.

Key words: aquaculture, consumer choice, country of origin, information shock, media.

1. Introduction

Coverage of food safety incidents, both in the USA and internationally, has increased significantly in the mainstream media. A series of incidents originating in Asia, which peaked in 2007, generated considerable attention on the safety and quality of imported food products. The USA, like Australia and other developed countries, currently depends heavily on imports to meet consumer appetite and demand for cheap shrimp. Various consumer food watch groups caution about consuming most imported farm-raised shrimp due to the risk of disease, habitat damage, pollution and the introduction of non-native species to the surrounding environment of the production site.[1]

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[1] A prominent example of one of these consumer food watch group is the Monterey Aquarium Seafood Watch program.

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Previous research has found that food safety information disseminated through media affects demand for various commodities (van Ravenswaay and Hoehn 1991). Similarly, Smith *et al.* (1988) and Gardner de Ville and Wang (2012) found that media coverage following a fresh milk safety incident and avian influenza, respectively, had a significant impact on product purchases. Piggot and Marsh (2004) developed a theoretical model of consumer response to publicised food safety information on meat consumption and found significant own and cross-commodity impacts on demand for meat in the United States following prominent food safety events. While there are various studies exploring the effect of information on consumer product acceptance (e.g. Lusk *et al.* 2004; Tonsor and Wolf 2012), there has been little recent research conducted on the effects of media headlines and news information on consumer preferences for imported aquaculture products originating in Asia.

Consumers' beliefs and perceptions are shaped, in part, by the media and information that they are exposed to. Through outlets such as the Internet, television and newspapers, consumers gather information regarding food safety outbreaks and other incidents that may impact their food purchasing decisions. This set of beliefs and innate-value laden preferences, which is exogenous to the product they purchase, should be distinguished from preferences arising from various product attributes. The objective of this study is to assess the impact of media information on consumer preferences for food safety, quality and environmental attributes within a country-of-origin framework.

2. The role of information in consumer preferences

Consumer choice theory, based on utility maximisation, examines how consumers achieve equilibrium between preferences and expenditures; this relationship is used to relate preferences to consumer demand for various products. As a result, consumers' preference structures and the factors that influence their decision-making have been the subject of various empirical studies, especially those concerning food purchase choice. In their study, Tonsor and Olynk (2011) summarise a body of literature focused on preference and demand shifters regarding various food products. Of particular attention to this area of study are the effects of information on consumer demand. The role of health and diet media information, product-recall news, generic advertising, precommitted demand and structural change has been studied using a wide variety of empirical methodologies (Tonsor and Olynk 2011). Because the majority of U.S. consumers receive a substantial amount of food product information through the popular press and television, a number of studies have incorporated the effects of media as potential demand shifters (see Piggott *et al.* 1996; Piggot and Marsh 2004; Tonsor and Olynk 2011). To date, most of the studies on this subject rely on revealed time-series data to measure the effects of news and media

information on consumer demand. A limitation to this well-established approach is the inability to capture the effects of information shocks on specific product characteristics (such as credence attributes) because product-specific consumption and price data are not readily available.

In recent years, the use of choice experiments to measure consumer demand for product-specific characteristics has surged. The advantages of using choice experiments as a stated preference approach have been well documented in the literature. These include the potential for ex-ante analysis of the demand for hypothetical goods or product attributes, which are generally not feasible within a revealed preference approach. Additionally, choice experiments avoid the open-endedness of early contingent valuation methods, and they are less prone to response biases and strategic behaviour by survey respondents (Hanley *et al.* 2001). The current study draws on recent developments in choice modelling and the use of information treatments in empirical economics to capture the effects of media information on consumer preferences and demand for various product-specific attributes.

3. Research design: data collection and methods

A survey of a sample representative of U.S. households was conducted in 2011 to assess consumer valuation for select product quality attributes and exposure to media information on food safety events. Participants were recruited from a large opt-in panel by Survey Sampling International to be representative of the U.S. population, at least 18 years of age, and familiar with the food consumption patterns of their household. In order to assess the effects of news headlines on consumer preferences, our sample was split into a treatment and control groups. A total of 670 respondents completed the survey; 335 respondents completed the choice experiment after viewing a series of news headlines regarding the safety of Asian aquaculture products and 335 completed the same choice experiment with no information treatment (without seeing any media headlines). The survey instrument was designed to elicit respondents' socio-demographic characteristics, shopping behaviour for fish and shellfish products, and preferences regarding verification claims associated with aquaculture safety and production techniques as well as consumer's information-gathering behaviour. Because of their relatively low costs, quick completion times and absence of nonresponse bias, online surveys are becoming more popular among applied economists and market researchers (Gao and Schroeder 2009; Olynk *et al.* 2010).[2] Table 1

[2] Various studies have found similar results when comparing online survey responses with those from traditional mail surveys as well as in-person interviews (Marta-Pedroso *et al.* 2007; Fleming and Bowden 2009). More specifically, Olsen (2009) found no statistically significant difference in willingness-to-pay estimates derived from online survey data versus conventional mail survey data.

Table 1 Sample summary statistics

Variable	No information	Information
Sample size (persons)	335	335
Age (mean, SD)	46.8 (16.8)	44.4 (16.7)
Female (%)	50.0	55.0
Number of adults in the household (mean, SD)	2.1 (0.9)	2.2 (0.9)
Number of children in the household (mean, SD)	0.6 (1.1)	0.6 (0.9)
Annual household income in thousands (%)		
<$20,000	19.0	15.9
$20,000–$40,000	27.8	26.6
$40,000–$60,000	20.9	18.6
$60,000–$80,000	12.8	12.2
$80,000–$100,000	9.9	10.1
$100,000–$120,000	3.3	7.5
$120,000–$140,000	2.7	3.6
$140,000–$160,000	2.1	2.1
$160,000–$180,000	0.6	0.4
>$180,000	0.9	3.0
Respondent level of education (%)		
Did not graduate from high school	3.5	1.6
Graduated from high school; did not attend college	20.0	15.5
Graduated from high school; currently attending college	4.5	4.2
Attended college; no degree earned	25.7	24.5
Attended college; associates or trade degree earned	12.5	11.2
Attended college; bachelor's (B.S. or B.A.) degree earned	23.9	27.5
Graduate or advanced degree (M.S., Ph.D., J.D.)	9.3	14.6
Other:	0.6	0.9
Monthly household shellfish consumption (lbs.) (mean, SD)	3.3 (2.7)	3.0 (2.4)
China news† (%)	43.9	45.6

Note: †Percent of respodents claiming to have seen at least one food safety headline from China in the past year.

reports summary statistics of selected variables for the information treatment and control groups.[3]

Choice experiments are used in this study to elicit consumer preferences on select product attributes. Choice experiments are conceptually based on Lancastrian utility theory, which postulates that consumers obtain utility from the attributes or characteristics of a product, rather than the product itself (Lancaster 1966). The overall utility derived from a product can be decomposed into separate utilities for its constituent characteristics (Ouma *et al*. 2007). In the present context, the product of interest, shrimp, can be described by the traits or characteristics that generate utility (or disutility) such as food safety enhancements, use of antibiotics and type of production practice employed. Within this context, we model consumers' utility functions within a country-of-origin framework, where each of the aforementioned attributes is inherently linked to the product's country of origin.

[3] A series of chi-square tests were conducted to compare the sample characteristics between the two groups, and no statistical differences were found.

Unlike the traditional conditional logit model where individuals are assumed to be homogeneous, heterogeneity in consumer preferences for food safety informational attributes is accounted for using a random-parameters logit (RPL) model. The RPL model is regarded as a highly flexible model that can approximate any random utility model and relaxes the limitations of the conditional logit by allowing random taste variation within a sample according to a specified distribution (McFadden and Train 2000). Under RPL, the deterministic component of utility (V_{nit}) in the random utility model takes the form of

$$V_{nit} = \beta' x_{nit}, \tag{1}$$

where β is a vector of random parameters, which have their own mean and variance, representing individual preferences, and x_{ni} is the vector of attributes found in the ith alternative. Following Train (2003), the probability that individual n chooses alternative i from the provided choice set in situation t is given by

$$P_{nit} = \int \frac{\exp(V_{nit})}{\sum_j \exp(V_{njt})} f(\beta) d\beta, \tag{2}$$

where the distribution of the random parameters is specified by its probability density function $f(.)$. If the parameters are fixed at β_{c} (nonrandom), the distribution collapses, that is $f(\beta_{\mathrm{c}}) \to \infty$ and $f(\beta) = 0$ otherwise (Ortega *et al.* 2011).

4. Empirical model

Five attributes were selected to be included in the choice experiment: price, food safety, antibiotic use, production practice and country of origin. Since most of the shrimp sold in the United States originates from a select number of countries in Asia, we narrow our discussion to products from China, Thailand and the United States. A blocked design maximising D-efficiency that allows for the estimation of the proposed interaction effects was used in the choice experiment in order to reduce response fatigue.[4] Appendix I provides the definitions of the attributes which were provided to survey respondents in preparation for and during the choice experiment. Appendix II depicts the information provided to our treatment group, and Appendix III contains a sample choice scenario. Given our attribute specification, including country-of-origin information, the deterministic component of utility can be defined as:

[4] The optimality criterion used in generating D-optimal designs is one of maximising the determinant of the information matrix. The D-efficiency for the experimental designs used in this study is 86.48. Each participant evaluated a maximum of ten choice sets.

$$V(\text{Shrimp}) = \beta_1 \text{PRICE} + \beta_2 \text{FS} \times \text{US} + \beta_3 \text{FS} \times \text{China} + \beta_4 \text{FS} \times \text{Thai} + \beta_5 \text{AU} \times \text{US} + \beta_6 \text{AU} \times \text{China} + \beta_7 \text{AU} \times \text{Thai} + \beta_8 \text{PP} \times \text{US} + \beta_9 \text{PP} \times \text{China} + \beta_{10} \text{PP} \times \text{Thai} \quad \text{for Options A and B;}$$

$$V(\text{Shrimp}) = \beta_1 \text{PRICE} + \beta_{11} \text{OptOut} \qquad \text{for Option C,}$$

where PRICE[5] is the price variable (in dollars per pound), FS×US is a variable interaction representing an enhanced food safety attribute on U.S. shrimp, FS×China represents enhanced food safety on Chinese shrimp and FS×Thai represents enhanced food safety on Thai shrimp. AU×US/China/Thai represents antibiotic-free shrimp originating from the respective country, and PP×US/China/Thai corresponds to shrimp being grown in a sustainable, eco-friendly type of practice. OptOut is an alternative specific constant capturing a no-choice response. For modelling purposes, the price coefficient is treated as fixed to ensure identification of value estimates. Several demographic characteristics were tested as covariates in the model, but were not found to significantly explain variation in preferences.[6]

Before estimation of the RPL, one must recognise that the random coefficients may be correlated (Scarpa and Del Giudice 2004). The RPL does not exhibit the independence from irrelevant alternatives property of the standard logit model, and general patterns of correlated taste parameters can arise (Revelt and Train 1998). This issue is of specific importance in products strongly characterised by their country of origin (Scarpa and Del Giudice 2004). For example, consumers who value enhanced food safety measures may also value antibiotic-free products or the use of environmentally friendly production practices in the food that they purchase. To account for these possibilities, we define β to be more precisely a $k \times 1$ vector of all the attribute coefficients, and η is a subset of β, a $(k-1) \times 1$ vector of the random attribute coefficients specified as $\eta \sim N(\bar{\eta}, \Omega)$, where the price coefficient is assumed nonrandom. The resulting random coefficient vector is expressed as $\eta = \bar{\eta} + LM$, where L is a lower triangular Cholesky factor of Ω such that $LL' = \Omega$, and M is a vector of independent standard normal deviates (Revelt and Train 1998).

5. Effects of media on willingness-to-pay

In order to test whether the information treatment has an impact on consumers' preferences for the various attributes, we first conduct a log-likelihood ratio (LR) test as in Lusk *et al.* (2006), by estimating the RPL

[5] Price has a value of zero for Option C.
[6] This result is consistent with that of previous studies (see Lusk *et al.* 2006).

models using maximum log-likelihood estimation (MLE) three times: one each for the treatment group data, control group data and the pooled data. We then calculate the test statistic using the maximised log-likelihoods of each model and reject the hypothesis that preferences are equal for both our treatment and control groups ($P < 0.01$). In order to account for differences in the scale parameter, a joint model was estimated with separate coefficients for the two groups (Swait and Louviere 1993). Parameter estimates from a random utility model are difficult to interpret due to the noncardinal nature of utility. Therefore, mean willingness-to-pay (WTP) estimates for the RPL model are calculated as the negative ratio of the estimated country-of-origin attribute coefficient to the price coefficient. The estimates are multiplied by two due to the use of effects coding (Adamowicz *et al*. 1994; Bech and Gyrd-Hansen 2005). The statistical variability of WTP estimates was assessed using a parametric bootstrapping technique proposed by Krinsky and Robb (1986) where 95 per cent confidence intervals were estimated using the model results. Mean and standard deviation estimates of the RPL model are presented in Table 2,[7] and derived WTP values for the two groups are presented in Table 3.

A complete combinatorial method proposed by Poe *et al*. (2005) was used to statistically evaluate differences of attribute WTP between the treatment and control groups. Specifically, a distribution of WTP values for each attribute was simulated under the two scenarios, and all possible differences between these two series were computed for each test. Consumer WTP for all nine attributes was found to be statistically different between the treatment and control groups. These results suggest that consumer preferences and WTP were affected by their exposure to food safety headlines. The largest difference in WTP is found on the food safety attributes of products from China and Thailand. When consumers were not presented with information, the mean estimated WTP values for enhanced food safety on shrimp from China and Thailand were estimated at \$0.94 and \$2.43 per pound, respectively. These WTP estimates decrease to −\$2.62 and \$0.43 for the group that was presented the news headlines. The deviation on WTP for enhanced food safety shrimp from the USA between the two models was less substantial, a change from \$7.81 to \$6.81 per pound. These results are consistent with the conventional wisdom that news reports on the safety and quality of foreign seafood products will impact demand for attributes on imported products more than on domestic products. The sharp drop in WTP for food safety on shrimp from China and Thailand suggests that when exposed to the media information, U.S. consumers do not trust that enhanced food safety really implies that shrimp from these Asian countries is indeed safer.

The treatment group presented with the information shock had a larger WTP for no antibiotic use than the control group for domestic shrimp

[7] Cholesky and correlation matrices are available from the authors upon request.

Table 2 Random parameters model results

	No Information	Information
Random parameters		
U.S. – Food safety†	1.084*** (0.107)	1.177*** (0.317)
China – Food safety	0.129 (0.145)	−0.452 (0.467)
Thailand – Food safety	0.336*** (0.108)	0.075 (0.583)
U.S. – No antibiotic use	1.017*** (0.116)	1.666*** (0.398)
China – No antibiotic use	−0.060 (0.141)	0.073 (0.583)
Thailand – No antibiotic use	0.016 (0.155)	−0.152 (0.518)
U.S. – Production practice	0.650*** (0.129)	0.649** (0.297)
China – Production practice	−0.463** (0.205)	−0.174 (0.554)
Thailand – Production pratice	−0.014 (0.148)	−0.125 (0.549)
OptOut	−3.152*** (0.467)	−2.997*** (1.128)
Fixed parameters		
Price	−0.278*** (0.018)	−0.271*** (0.027)
Distribution parameters (SD)		
U.S. – Food safety	0.673*** (0.139)	1.202*** (0.388)
China – Food safety	0.934*** (0.217)	1.525** (0.616)
Thailand – Food safety	0.648*** (0.140)	1.288** (0.518)
U.S. – No antibiotic use	1.095*** (0.150)	1.473*** (0.543)
China – No antibiotic use	0.752*** (0.182)	1.868** (0.731)
Thailand – No antibiotic use	0.915*** (0.189)	1.469** (0.609)
U.S. – Production practice	1.102*** (0.221)	1.795** (0.697)
China – Production practice	1.184*** (0.250)	1.123 (0.792)
Thailand – Production pratice	0.473*** (0.170)	0.945 (0.792)
OptOut	5.588*** (0.457)	7.231*** (1.409)
N	6913	
Number of parameters	232	
Log-likelihood	−4647.59	
Adjusted Pseudo-R^2	0.39	
AIC	9759.18	
AIC/N	1.41	

Note: *,** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. Standard errors presented in parenthesis. †Attributes are effects coded.

products. This indicates that consumers associate food safety problems in aquaculture products with increased use of antibiotics and are willing to pay a premium to know that antibiotics were not used in the production of the product in the wake of a food safety incident. Compared to the results for the enhanced food safety attribute, this suggests that media information can have the opposite effect on consumers' preferences for a specific food safety attribute such as no antibiotic use.

With regard to the eco-friendly production process attribute, consumers of both groups only had a significant positive WTP for U.S. grown shrimp. While there is a growing body of literature suggesting that consumers are increasingly concerned about environmental impacts of aquaculture production (see Johnston and Roheim 2006), our results suggest that American consumers do not place as much importance on environmental stewardship in foreign countries as they do in their home country.

To ensure robustness of our findings, we estimate the effect of the information treatment on individual consumer WTP for enhanced food

Table 3 Derived willingness-to-pay values [95% confident intervals]

Variable	No Information Mean [95% CI]	Information Mean [95% CI]	*P*-value of difference
U.S. – Food safety	**7.81** [7.04, 8.65]	**6.81** [6.24, 7.38]	0.029
China – Food safety	**0.94** [0.23, 1.64]	**−2.62** [−3.23, −2.01]	<0.001
Thailand – Food safety	**2.43** [1.66, 3.21]	0.43 [−0.19, 0.98]	<0.001
U.S. – No antibiotic use	**7.31** [6.57, 8.10]	**9.63** [9.00, 10.36]	<0.001
China – No antibiotic use	−0.46 [−1.10, 0.22]	0.43 [−0.13, 0.96]	0.027
Thailand – No antibiotic use	0.11 [−0.59, 0.81]	**−0.89** [−1.48, −0.30]	0.017
U.S. – Production practice	**4.68** [3.97, 5.40]	3.74 [3.17, 4.28]	0.022
China – Production practice	**−3.35** [−4.14, −2.58]	**−1.01** [−1.64, −0.40]	<0.001
Thailand – Production pratice	−0.10 [−0.79, 0.61]	**−0.72** [−1.28, −0.17]	0.099

Note: Bold figures are statistically different from zero with at most 5% probability of Type I Error.

safety while controlling for socio-demographic and other related factors in a linear regression framework. To do so, individual-specific parameters and corresponding WTP values for the country-specific food safety attribute were estimated. The determinants of interest include consumer's socio-demographic characteristics, shellfish consumption (ShellCons), and exposure to reports on Chinese food safety events (ChinaNews). The information treatment (InfoShock) was introduced as a dummy variable, taking a value of one for observations with media exposure and zero otherwise. Table 4 presents OLS results of the effects of these variables on WTP for an enhanced food safety attribute in shrimp. We find that consumers who were subject to the information treatment, which featured news headlines from Asia (not China specifically), had a significant reduction in their WTP for enhanced food safety attributes in shrimp imported from China (−$3.67), to a lesser degree shrimp farmed in Thailand (−$2.16), and the least for domestic shrimp (−$1.18). We do not find evidence that consumers' socio-demographic characteristics and related factors statistically influenced our results.

6. Policy implications and conclusion

A number of studies are emerging that assess consumer preferences and WTP for product safety and quality attributes to better inform food policy and agribusiness decision-making. However, the majority of these studies do not take into consideration the interdependency that exists between select product attributes and country of origin. With an increasing volume of food products being exported from Asia and the severity of food safety problems in the region, more research is needed to provide information to policymakers, producers and agribusinesses. Given that demand for food quality and safety is influenced by various sources of information, the effects of media on consumer preferences need to be further studied. In order for producers, and others in the supply chain, to address safety concerns and communicate effectively with consumers across international borders, a deeper

Table 4 WTP for enhanced food safety OLS results

Variable	U.S. food safety	China food safety	Thailand food safety
Intercept	8.704*** (0.471)†	0.996* (0.593)	2.702*** (0.473)
Male	−0.355 (0.250)	0.510 (0.274)	0.269 (0.218)
Age	−0.014* (0.008)	0.005 (0.010)	−0.005 (0.008)
Income	1.24E-06 (3.21E-06)	−6.51E-07 (3.47E-06)	3.24E-06 (2.84E-06)
College	0.105 (0.296)	0.149 (0.305)	−0.076 (0.248)
Child	−0.169 (0.277)	−0.451 (0.326)	−0.223 (0.258)
ShellCons	0.013 (0.050)	0.028 (0.065)	0.000 (0.053)
ChinaNews	0.028 (0.257)	−0.431 (0.282)	0.020 (0.225)
InfoShock	−1.184*** (0.251)	−3.674**** (0.280)	−2.157*** (0.221)
R^2	0.039	0.231	0.138

Note: *,** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. †Robust standard errors presented in parenthesis.

understanding of consumer tastes and preferences for production process attributes of various products – produced both domestically and overseas – must be obtained.

This study investigates consumer demand for food safety and quality attributes within a country-of-origin framework and assessed the effects of media headlines on consumer purchasing behaviour using U.S. consumers as a case study. Our research builds upon a body of existing literature on the impacts of information on consumer choice and preferences. We provide evidence of the effects of food safety headlines, or 'information shocks' on consumers' willingness-to-pay for product characteristics within a country-of-origin framework. Since consumers were found to trust domestic products more, domestic aquaculture producers would be better positioned in their home market by marketing their product as domestically grown. While the USA requires that all unprocessed seafood be labelled according to country of origin, this product cue is often overlooked in the marketing of aquaculture products to U.S. consumers (Wang *et al.* 2013). With increasing concerns over the safety of imported products and the proliferation of this information via the media, U.S. agribusinesses can capitalise on this information to better position their product in the market place. Additional studies are needed regarding country-of-origin labelling throughout various markets. Admittedly, different countries will view production from various regions differently; trusted authorities providing verification to a market in one country may be distrusted by markets in other countries, even if production processes are identical. Products imported from developing countries to developed countries, such as Australia and the European Union, are likely to follow this pattern because the safety and quality standards in the importing country tend to be higher.

From an international agribusiness development perspective, Chinese and Thai food policymakers would better serve their producers and processors by carefully addressing food safety and quality issues within their food supply chain. Assurance of product quality to foreign markets and mitigation of negative media coverage would improve the position of food product

overseas, particularly in the USA and possibly other Western nations such as Australia. This study finds that consumers associate negative information on food safety and quality out of the Asia region to products originating in China. Chinese industry and policymakers need to devote resources to improving their food safety situation as well as perception of their food products abroad.

Additional work focusing on the dynamics of consumer behaviour and their response to food safety information could be valuable in providing knowledge on lag effects of media reports on consumer demand for international products. In addition, research on the perception of Asian products in other foreign markets would greatly enhance the literature and serve as a benchmark for future studies. Furthermore, research on foreign producer behaviour regarding their production practices would supplement the current work available on food product safety and quality.

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Appendix I: Choice experiment definitions

Food Safety (FS) refers to the potential presence of additional food safety measures beyond current laws:

Enhanced food safety practices are assured.
No claim is made about additional food safety measures.

Antibiotic Use (AU) refers to the use of antibiotics on shrimp:

Not Permitted means the shrimp was raised on an operation claiming to *never* administer antibiotics.
Permitted indicates that no claims regarding use of antibiotics are being made.

Production Practice (PP) refers to the type of production method employed:

Eco-friendly means that environmentally friendly measures have been taken in producing the product beyond current laws.
Conventional means that no claims regarding eco-friendly practices are made.

Country of origin refers to the location where the shrimp was farmed or raised:

United States (US).
China (China).
Thailand (Thai).

Appendix II: News headlines

Approximately 80 per cent of the seafood consumed in the USA is imported and government reports suggest that < 2 per cent of imported seafood is inspected in the USA. Following are some main news headlines from the past 4 years:

"U.S. food inspectors overwhelmed by imports: Billions of dollars' worth of foreign ingredients slip by without safety checks"
"Tainted foods pose daily problem in Asia"
"Drug-Tainted Asian Fish Slips into US"

Note: The sources of the news headlines are as follows: Associated Press, USA Today and Bloomberg, respectively.

Appendix III: Sample choice scenario

Shrimp attribute	Option A	Option B	Option C
Price ($/pound)	$11	$7	
Food safety	Enhanced	No claim	I choose not to purchase either product
Antibiotic use	Not permitted	Not permitted	
Production practice	Eco friendly	Conventional	
Country of origin	United States	China	
I Choose:			