



Information on food safety, consumer preference and behavior: The case of seafood in the US



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ABSTRACT

In this paper, we study three issues related to US consumers' attitude about food safety for imported food. First, we investigate the relationship between U.S. consumers' perception and their actual behavior when purchasing seafood, and find a conflict in that many consumers think the food country of origin label (COOL) is extremely important but they don't check the label when purchasing. Second, we assess factors that affect consumers' attitude toward country of origin information and safety certification labeling. We find demographic characteristics matter, in that female and less educated individuals care more about both kinds of labels than their counterparts. We also find older people tend to care more about COOL while consumers with higher consumption care more about the labels explicit on food safety. Finally, we address consumers' perception on the level of safety associated with fish and shellfish products produced in six major U.S. seafood importing countries. They trust Canada much more than Indonesia, Ecuador, Thailand, China and Viet Nam, and quality certification labels help to improve the trust on Indonesia and Ecuador but not much on the other countries.

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1. Introduction

As consumers' food demand becomes more complex and dynamic, food labeling is playing an increasingly important role in the food marketing system (McCluskey & Loureiro, 2003). Consumers are constantly obtaining different kinds of information about food attributes via food labels which greatly influence their purchasing decisions. Theoretically, consumers demand food-product attributes (e.g. food quality, taste, etc.) where the food-product is considered to be a bundle of these individual attributes which give rise to utility. In the present context, food products can be viewed as a collection of its food safety informational attributes such as the certifications it possesses, traceability systems it belongs to and other information in the labels it carries (Ortega, Wang, Wu, & Olynk, 2011). Thus purchasing decisions made by consumers are based on specific food attributes attached to a food-product (Lancaster, 1966). While food attributes are often not observable, the only source of such information is the food label. Hence, information contained in food labels can affect the demand for the food-product.

Recent studies show that consumers will pay premiums for certain attribute claims made by different food labels, such as

“Environmentally-friendly” claims made by eco-labels, “organically produced product” claims in organic labels, and whether it is considered safe from a certain country in the case of country of origin labeling (COOL) (Burton, Rigby, Young, & James, 2001; Loureiro, McCluskey and Mittlehammer, 2001; Umberger, Feuz, Calkins, & Killinger, 2002). These studies allude to credence attributes, which consumers have no reasonable means of verifying for themselves. Production standards differ between countries, and COOL information is often seen as an effective way for consumers to differentiate between these standards. This is especially true, as the quality demanded by consumers is not only product but also process specific. Frequently, process quality cannot be determined by the individual consumer without considerable costs being involved. Hence, it is relevant to examine if COOL is an important quality indicator and if so, what kind of consumers would rely on this indicator?

Although it is commonly acknowledged that consumers use COOL information to evaluate food products (Hong & Wyer, 1989; Maheswaran, 1994) the importance of COOL as a quality cue in consumer evaluation has been both confirmed and rejected in the literature (Bilkey & Nes, 1982). Some studies have demonstrated that COOL information is used to signal product quality, while others have concluded that consumers use COOL as a credence and extrinsic product attribute (Bilkey & Nes, 1982; Hong & Wyer, 1989; Hong & Wyer, 1990). According to Zago and Pick (2004), the effects of COOL regulation depend on how consumers' perceive the quality of imported and domestic products.

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This issue is particularly important in seafood products, as the U.S. imports 91% of its seafood with a net import value, or trade deficit, of approximately \$10.4 billion. Canada, China, Indonesia, Viet Nam, Ecuador, and Thailand are the six major suppliers of seafood in the US market. There has been a higher food safety concern in the developing countries on this list than in the US. Consumers in the US are using the COOL information to signal the level of food safety. COOL is mandated by USDA for seafood (USDA/AMS 2003). Seafood imports include primarily, shrimp, Atlantic salmon, tilapia, and other shellfish (NOAA, 2013).

Previous research mainly discusses the impact of the introduction of mandatory COOL program on meat products as well as consumers' willingness to pay for products with labels on specific attributes, such as the impact of dolphin-safe labels on consumer behavior (Teisl, Roe, & Hicks, 2002). There is a gap in the literature regarding how consumer's perception about such specific labels affects their preference on country of origin (COO), and how consumers' behavior and perception might be inconsistent, especially in seafood. This study examines the situation of perception behavior conflict and discusses some of the characteristics of this inconsistency. It also discusses how seafood labels and how seafood consumers' consumption behavior and perceptions on labels affect their attitude toward country of origin information and safety certification labeling. Furthermore, this study differentiates consumers' safety awareness toward several specific countries and the underlying factors.

2. Data

In the summer of 2011, an online survey representative of U.S. consumers was conducted to assess preferences for different attributes of seafood products.¹ The data collection was outsourced to a reputable market research company, Decipher Inc., who recruited survey participants from a large opt-in panel from 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. The sample of 1004 effective observations is representative of the U.S. population with regards to geographic distribution by state, income level, education, gender and age.

Variables in the survey are specified in Table 1. "COOLR7" and "SafetyR7" indicate respondents' rank for the level of importance that they place on country of origin and food safety, respectively, when purchasing fish and shellfish products from 1 to 7, with 1 being the least important and 7 being the most important. Based on another variable revealing whether they check the COOL or not (not reported in the table), we observe some respondents assigned a high rank (4 or to 7) on the level of attribute importance but they didn't check when purchasing fish and shellfish products. We define "inconsistent" for such respondents, and vice versa, for respondents who gave a lower rank (lower than 4) on the COOL but actually checked the label when purchasing. The variable "Inconsistency" is 1 when the respondent is inconsistent and 0 otherwise.

"SafeVar" is the variance of the respondents' safety rank on seafood products from Canada, China, Indonesia, Viet Nam, Ecuador, and Thailand, the six major suppliers of seafood in the US market. Those who are indifferent about product safety regarding different countries will have a smaller variance and those who think products from these countries are very different with regards to safety will have a larger variance.

Variables such as "Age", "Male", and "Children" are self-explained demographic variables. "IncTenK" is the annual pre-tax household income. "Educ" shows how many years the respondent has received formal education. In the survey, a question was asked about the highest level of education completed and was provided with discrete choices. Here data are treated as continuous and different years are assigned according to different level of education completed.² "Coastal" shows whether the respondent resides in a state that has a coastline,³ thus is traditionally assumed to have greater access and demand for fish and shellfish products.

"FishConsum" shows the amount of fish (for example tuna, salmon, tilapia and other varieties of fish) the household of the respondent purchase in a typical month in retail stores (i.e. traditional grocery store, superstore, warehouse club store, or local seafood market), while "ShfishConsum" shows how much shellfish (for example shrimp, crab, scallops, oysters and other varieties of shellfish) the household of the respondent purchase in a typical month in retail stores.⁴ The consumption distribution is shown in Fig. 1. We can see that the consumption of shellfish is lower than fish, and there is a larger portion of individuals who do not eat shellfish.

Several variables pertaining to the source of food safety information are included. "GovS" is a binary variable that indicates if the respondent most frequently obtains information on food safety from government agencies such as U.S. Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA), other federal governmental agencies or state governmental agencies. "UnivS", "ProducerS", "RetailS", "ConsumerS" are binary variables indicating if the respondent most frequently relies on information from University Scientists/Researchers, Producer Groups (e.g. Regional Marketing Boards), Retailers (e.g. Supermarkets, Grocery Stores, etc.), or Consumer Groups (e.g. Center for Science in the Public Interest, etc.) respectively, when obtaining information on food safety.

The survey solicited information regarding respondents' purchasing behavior about seafood products, and preferences for different seafood attributes. Respondents were asked in the survey to rank the level of importance for the product they purchase to be produced using environmentally sustainable practices (EnvironR), without modern technologies (NaturalR), organic (OrganicR), and processing the COOL.

When purchasing fish and shellfish products, respondents were also asked to rank the level of importance they place on different nutrition characteristics (ProteinR, FatR, and CholR), on packaging of the product (PackR), and on the Quality Certification Label shown on the package (QualityR). For all the questions on different attributes, the rank is in the range of 1–7, with 1 being least important and 7 being most important. In order to reduce the number of dummy variables, this paper assume that each ranking variable

² The variables takes value 8 of those who did not graduate from high school; 10 for general educational development; 12 for high school graduates without going to college and graduates from vocational schools; 13 for those with some college education but without a degree; 14 for associate or trade degree holders and current college students; 16 for Bachelor degree holders; and 19 for graduate and advance degree holders.

³ The coastline states of the US are Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New Jersey, New York, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, California, Oregon, Washington, Alaska, Hawaii, Florida, Alabama, Mississippi, Louisiana, and Texas.

⁴ Categorical choices are provided in the original survey as no consumption, zero to one pound, one to two pounds, until nine to ten pounds with one pound incremental, and above ten pounds. We use the midpoint value of each category as the consumption variable, except the value for those who checked the last category is assigned as 12.

¹ This online survey recorded each respondent's time of answering the questions. Only those who finished surveys within a reasonable time were considered effective.

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