

## ASSESSING CONSUMER DEMAND FOR FOOD QUALITY CERTIFICATION: CASE OF “HACCP CERTIFIED EGGS”

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### ABSTRACT

This study was aimed to identify the key food quality attributes that the consumers take into account as they purchase essential food items, in general, and eggs in particular, and extent to which the provision of information augments the consumer demand for “HACCP-certified eggs”. It uses the attributes categorized in ‘Caswell’s Classification on Food Quality’ under different subsets, i.e.: Food safety, Nutrition, Sensory, Value, Process, Text and Cues, and in another classification based on the level of information use by a consumer, i.e.: Search, Experience and Credence to develop the analytical framework. Data were collected from a sample of educated, middle-income urban consumers (n=200) from Kurunegala and Colombo districts from March – April 2015 through personal interviews carried out with the aid of a structured questionnaire and various flyers designed for the purpose. The results showed that consumers rank the “Label” (83.5%), “Price” (49.5%) and “Purity” (40%) attributes as the most important as they purchase an essential food item; yet, for the case of eggs, “Appearance” (75.5%) ranked the first followed by “Purity” (69.5%) and “Price” (30.5%). This highlights that consumer demand for eggs is mainly decided by Search (e.g. appearance, purity) and Experience (e.g. weight, place of origin) attributes of quality. However, it revealed that product certification, which is used extensively with the food items like meat, fish, sea food and milk to signal the compliance of the product with Credence attributes, plays an insignificant role with regard to eggs. The outcome of analysis, overall, suggests that, from a food economics point of view, HACCP-certified eggs is not ‘value for money’ for an average consumer as the price premium paid for such does not compensate for the marginal benefit obtained through the “augmented quality”.

**Key words:** Certified food, Food information, Food safety and quality, HACCP

### INTRODUCTION

Consumer demand for “certified food” has emerged as a key market force for suppliers in the food value-chain in both developed and developing countries, but the lack of information generated through empirical investigations makes it difficult to formulate appropriate policies governing such products. Based on the “level of information” available for a consumer to decide on different ‘Food Quality Attributes’ they can be classified into three categories as: *Search*, *Experience* and *Credence* (Nelson, 1970). Caswell (1998) classified the various attributes of food quality into a number of distinct ‘Subsets’, namely: *Food safety*, *Nu-*

*trition*, *Sensory*, *Value*, *Process*, *Text* and *Cues*. In reality, almost all attributes included in the Food safety subset (e.g. Foodborne pathogens; Heavy metals; Pesticide residuals and Food additives etc.) show Credence characteristics, because it is extremely difficult for a consumer to judge on the true nature of such attributes by “observing the product before purchasing” (i.e. Search; *Ex-ante*) or “after consuming” (i.e. Experience; *Ex-post*) (Kariyawasam *et al*, 2007; Silva *et al*, 2012).

To overcome this issue, food suppliers therefore, tend to “certify” their products by adopting various food safety and quality management meta systems, for example ISO22000

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and ‘Hazard Analysis and Critical Control Points’, which is commonly referred to as HACCP, and convey that information to their customers through “information labels” (Caswell and Mojduszka, 1996). This study was aimed to identify the key food quality attributes that the consumers take into account as they purchase essential food items, in general, and eggs in particular, and extent to which the provision of information augments the consumer demand for those eggs certified through a system of HACCP, hereinafter named as: “HACCP-certified eggs”.

Selection of eggs as the case for analysis is on the rationale that it is one of the major sources of protein in regular diet of Sri Lankan households; its national production in 2013 was about 1,741 million, and the per capita consumption of egg was estimated to be about 97 per annum; thus, supplying of a quality product to the marketplace is of paramount importance (Anon, 2014). Eggs are available in local markets mostly in three major forms such as: (1) “HACCP certified & packaged”; (2) “non-certified & packaged”, and (3) “non-certified & non-packaged”. The items (1) and (2) above can be counted as a “processed / value-added” product, which is assorted in a carton prepared with corrugated cardboard to include 6 or 12 eggs normally, and are available for sale usually in supermarkets/chain-stores in urban/semi-urban areas. The form (3) in contrast is freely available as a “generic” product island wide in retail shops/grocery stores to purchase in bulk in any quantity.

## MATERIALS AND METHODS

The first step towards analysis was to identify the most preferred Food Quality Attributes with special focus to eggs. Based on the Caswell’s Food Safety and Quality Classification (see, Table 1), a list of 21 specific attributes were selected to represent all the subsets for this purpose, including: (1) Pathogens; (2) Heavy metals; (3) Pesticide residues; (4) Food additives (5) Natural toxins; (6) Veterinary

residues (7) Fat and cholesterol; (8) Minerals; (9) Calories; (10) Carbohydrates; (11) Protein; (12) Vitamins; (13) Purity; (14) Price; (15) Appearance; (16) Taste; (17) Brand name; (18) Size and weight; (19) Package material; (20) Certification, and (21) Label.

Further, to reveal the knowledge, attitude, practices and perception (KAPP) of a consumer towards various aspects of food quality certification and the role of information regarding certified food, a set of 10 statements were formulated (see, Table 2).

Having set all these subsets/attributes into a structured questionnaire, a personal interview was carried out with a cross section of urban consumers who completed G.C.E. (Advanced Level) (i.e. level of education) and earn a minimum of Rs. 30,000 per month per household (i.e. level of income) and also have an “easy access to a supermarket” (i.e. less than 1.5 km) from Kurunegala and Colombo districts (n=200) in March – April 2015 to collect data. Each respondent was asked to ‘rank and order’ the 5 attributes out of 21 listed that the consumer “rates as the most important before purchasing” an essential food item and eggs, separately. Further, each consumer was instructed to score on an individual KAPP statement using a scale: 0 = “absolutely not aware” to 5 = “completely aware”.

At this point, the respondent was supplemented with a “package of information” characterizes by two distinct flyers – one specifies the nature and procedure used in certification of eggs and the other highlights the guidelines and standards used in certification of food products with HACCP. About 10 to 15 minute discussion based on the information included in each flyer was carried out with the respondent, in turn. The idea is to enhance consumer’s knowledge with respect these areas, and in turn, induce him/her to purchase certified eggs by taking into account of information included on the flyer (i.e. motive towards a product shift). The “well-informed” respondent was then asked

whether he/she would purchase HACCP-certified eggs from the market next time onwards, and if not, the reasons for his decision were probed, in particular.

The scores provided to KAPP statements on six-point likert-scale (i.e. 0 to 5) were subjected to a Confirmatory Factor Analysis for verification purposes, and in turn, was used to develop an index, namely “Food Safety Awareness Index” (FSAI) of which the values, once standardized using the Maximum Potential Score of 50 (i.e. 10 x 5), range from 0 to 1.

## RESULTS AND DISCUSSION

Fifty five percent of respondents in the sample were females and the mean age and family size were 48.5 years and 4.3 persons per family, respectively. The average distance to the nearest supermarket of 200 respondents in the sample was 1.2 km. These, together with the facts that the respondents were educated above G.C.E. (A/L) and possess a relatively high monthly household income (> Rs. 30,000), provide a rationale that, if a respondent wishes to shift from ‘non-certified’ to ‘HACCP-certified eggs’, the existing socio-economic status of the household shall not act as a barrier for such transformation.

**Table 1. Food quality attributes based on Caswell’s classification**

Quality Attributes	Forms of the Attribute (for the case of Eggs)
<b>Food Safety</b>	1. Pathogens ( <i>Bacteria: Salmonella spp., Staphylococcus Aureus; Virus: Avian Influenza</i> )
	2. Heavy Metals ( <i>Cadmium, Copper, Zinc etc.</i> )
	3. Pesticide Residues
	4. Food Additives
	5. Natural Toxins
	6. Veterinary Residues
<b>Nutrition</b>	7. Fat and Cholesterol
	8. Minerals
	9. Calories
	10. Carbohydrates
	11. Protein
	12. Vitamins
<b>Value / Functional</b>	13. Size and Weight ( <i>Medium: 49-56g; Large: 56-63g; Extra Large: 63- 70g</i> )
	14. Purity
	15. Appearance
	16. Package Material ( <i>Plastic, Corrugated Cardboard, Molded Pulp</i> )
<b>Sensory / Organoleptic</b>	17. Taste
<b>Text / Measurement</b>	18. Certification ( <i>ISO 22000, HACCP, GMP</i> )
	19. Labeling
<b>Cues</b>	20. Price ( <i>Rs. 120-150, Rs. 190-250</i> )
	21. Brand Name ( <i>Nelfarms, Happy Hen, My Choice, The Farmers’</i> )

Source: Lakni and Jayasinghe-Mudalige (2009)

Mean of the “Food Safety Awareness Index” (FSAI) derived using the scores provided to KAPP statements was 62.5. This highlights that consumers, customarily, are quality concerned, and they expect that a high level of quality is maintained in the essential food items that they consume in their day-to-day life.

The results show that, out of the 21 food quality attributes considered in the analysis (see, Figure 1) and in the context of an essential food item, a typical consumer is highly concerned about the “Label” (83.5%), “Price” (49.5%) and “Purity” (40%). However, there was a change to this order in the case of eggs, i.e. the consumers ranked the “Appearance” (75.5%) as the top most important attribute followed by “Purity” (69.5%) and “Price” (30.5%).

Further, it was found that “Brand name” and “Fat content” matter to a reasonable extent for consumers as they decide to purchase an essential food item. Yet, these two specific food quality attributes did not play a substantial role on their decision to purchase eggs. In-

stead, the “Size and weight” was selected as an important attribute for eggs. Remarkably, “Certification” attribute was not indicated within the first five most preferred attributes in the case of essential food items and eggs. But from the outcome of analysis it was clear that the respondents placed “Certification” as a minor attribute by placing it in the bottom of list of attributes considered in this analysis.

The outcome of analysis to see whether the consumers, once they are enriched with full-information on certified eggs, would purchase HACCP-certified eggs from next time onwards suggests that only about 7.7 percent of respondents (i.e. 15/200) would make a product shift, or in other words, do not want to purchase certified eggs. Of the respondents who do not want to purchase certified eggs (i.e. 92.5%), 41 percent declared that the ‘price premium’ they have to pay for certification [i.e. difference between item (1) and (3) above] is not reasonable, i.e. there is no “value for money”. Further, nearly 25 percent of respondents indicated that they already have fairly easy access to high quality raw eggs at a very reasonable price from various

**Table 2. Factor analysis results for the KAPP statements**

KAPP Statements	E (L)
All food stuff should be organic	2.075 (0.295)
Producing safer food is costly	1.276 (0.142)
Purchase food from street vendors	1.225 (-0.170)
Always purchase food from supermarkets	1.091 (0.120)
Look for nutrition information when shopping	0.937 (0.594)
Buy organic products whenever they are available	0.891 (0.786)
Look for organic certification when buying organic products	0.769 (0.804)
The risk faced by you regarding food safety is insignificant	0.741 (0.175)
Consume ready-to-eat meals	0.586 (-0.021)
Buy bottled drinking water	0.404 (-0.248)

*E- Eigen value, L-Loading, Statements are adjusted from Birol et al., 2014.*

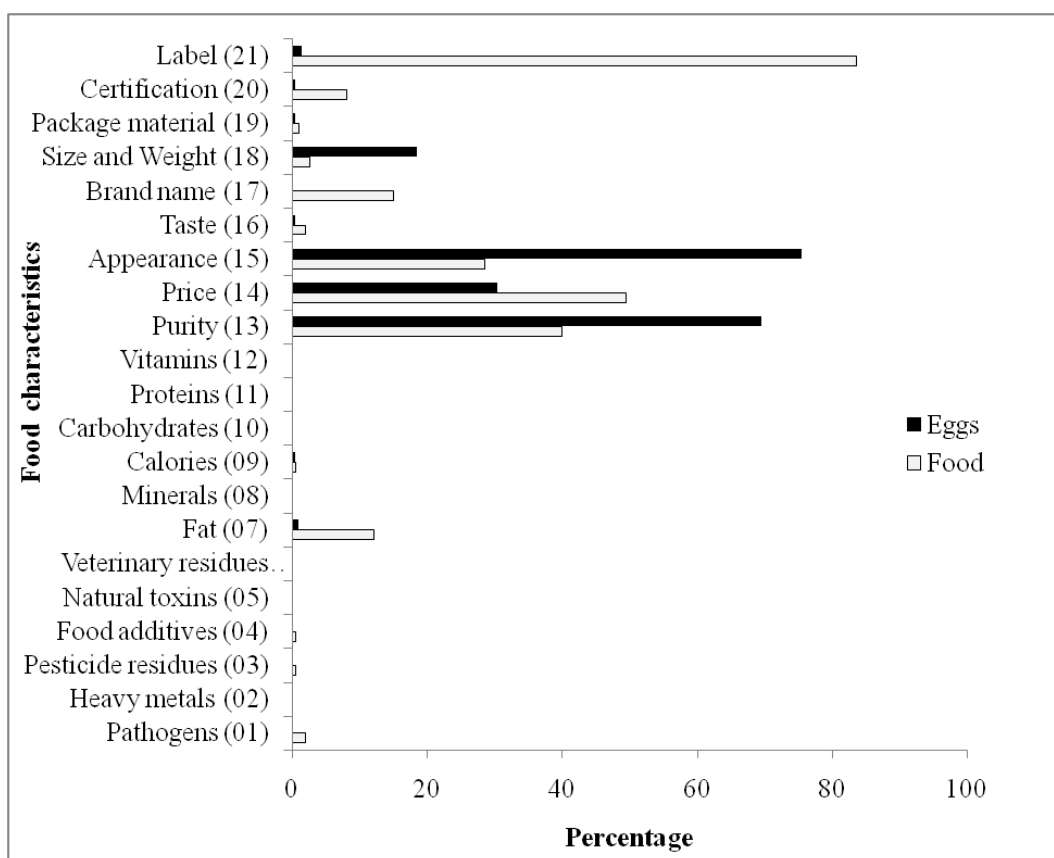
points of sale reliable to them (i.e. nearby grocery shops, directly from producers etc.). Many indicated that certification of eggs is merely a ‘tactic’ used by large-scale suppliers to discriminate market by creating unwanted health claims; thus, to exploit consumers by charging a high price for otherwise “same quality” eggs.

The outcome of analysis reveals certain implications for product quality assurance, especially for convenience of purchasing essential food products like eggs, which is a prominent part of diversified day-to-day diets in Sri Lanka, but its income share is relatively minor for an average consumer. The results highlight that consumers, as they purchase eggs regularly for household consumption, largely depend on ‘Search’ (i.e. size, appearance) and ‘Experience’ (i.e. weight, place of origin) quality attributes that are classified under Sensory, Value, Process and Cues sub-

sets. This is an indication that consumers, in general, are not critically worried about the impact of certain ‘Credence’ attributes classified under the Food safety and Nutrition subsets, for example Food additives and Calories etc., as they consumed eggs.

**CONCLUSION**

In fact, the outcome clearly shows that consumers are highly concerned about the label in their decision to purchase an essential food item, largely because it provides the vital information pertaining to an expiry date, nutrition facts and cooking procedures etc. Through the label, all these Credence attributes become Search, and then Experience attributes for them. Nevertheless, for eggs, the outcome of analysis imply that the majority of consumers believe that they can judge credence characteristics associated with eggs from the external appearance, i.e. through



**Figure 1. Food quality attributes preferred by consumers**

Search and Experience. Thus, for a 'known product offered at a relatively small price', they do not want to pay 'extra money'. From an Economic point of view, the results, overall, imply that the price premium a consumer pays for a certified egg does not compensate for the marginal benefits that the consumer derives by consuming the product.

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