Consumers’ purchase decision based on intrinsic and extrinsic factors related to food safety issues: A review

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Abstract. Food Safety issues have been arising around the world and have led to many adversarial effects to consumers. Purchasing decisions have become more complex as it is impacted by many intrinsic and extrinsic factors that triggered changes in consumers’ behaviour. Few reviews have been conducted on the intrinsic and extrinsic factors related to food safety on consumers’ purchasing decisions. According to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA Statement) procedure and Web of Science (WoS) as the main database, 25 related studies were identified. Furthermore, these articles resulted with two main types of consumers’ purchasing decisions that lead towards consumer satisfaction which are willingness-to-pay and purchasing intention. These two themes were further analysed to identify food safety factors which produce several intrinsic and extrinsic factors including consumers’ characteristics, role of media, product characteristic, credence attributes and supply chain actors. Several recommendations are suggested for future in qualitative and quantitative studies, to produce a standard methodology for review in research synthesis in the context of consumers’ purchasing decision and food safety such as tracking of citation and reference searching techniques.

1. Introduction

Food security aims at providing enough food supply which is safe and nutritious to feed the population. Concern in food security and safety comes together. Food safety issues have currently arisen and become a concern at national and international level. Among the safety issues are the presence of pathogenic microorganisms, allergens, contaminants such as pesticides and nutrition labelling. Safety incidents have been reported in many countries that led to product recall of certain food products due to contamination with many harmful ingredients [1, 2]. Consumers expect foods that they purchase to be safe and high quality. According to Food and Agriculture Organization [3], consumers have the right to give their opinions on food industrial activities, standards, and procedures to ascertain safety of food products. The success of private enterprise is dependent completely on the satisfaction of the consumer. Many factors could influence the expectation, perception, and purchase...
decision of consumers. Due to these issues, food industries need to ensure effective strategy to deliver information and establish effective communication between industry and consumers. Among the most common methods used to convey information are via advertising, promotion of product and marketing and labelling of product.

With the increasing food safety issues around the world, consumer awareness has also been increased which affects consumers’ decision-making factors. The main goals in the food supply chain are in obtaining consumers satisfaction. Shift in consumers choices and demand has been reported especially due to pandemic [4, 5]. Consumers tend to choose several types of food which are convenient, and some changes have been detected because most consumers feel safe when cooking at home rather than buying from the other food service restaurants. Some of the restaurants need to be closed early, restriction in travelling and cross border between cities and country have resulted in changes in daily habit, choices, and preferences of food products. Intrinsic factors refer to internal variables within an individual which involve physiological state, emotional, behavioural, or personal individual background, while extrinsic factors are the external variables, elements or conditions which is not associated with intrinsic factors such as environmental aspects, product characteristics, safety, and quality attributes. Since consumers purchasing is especially important as their choices affect the sustainability of food industries, this paper aims at reviewing the most common factors related to food safety that affect consumers’ purchasing decisions. Thus, this study aims to recognize the extrinsic and intrinsic factors of consumers purchase decisions related to food safety which subsequently led to consumers satisfaction.

2. Methodology
A review is performed in this study by the selection of related literature reviews in food safety with relation to supply chain quality management practices using “Web of Science” (WoS) as the main database by referring to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) method [6]. The unique advantages of PRISMA methodology rely upon the systematic methodology which provides a clear definition of research questions, identification of both inclusion and exclusion criteria and literature searching effort at a defined time from large literature databases. Keyword used for search of terms related to food safety studies for the food industry related to consumers is summarized Table 1.

Several inclusion and exclusion criteria applied. For inclusion criteria, only full text article journals in English language were selected between the year of 2016 to 2020, whereas the other literature type (i.e. review, proceeding, book, book series) were excluded to identify recent research issues in food safety. The number of studies found from WoS and additional database searching using Scopus were summarized in Figure 1. In the screening stage, most of the study that have been excluded due to year of publication, document type (other than full text articles) and not within subject area of study (business, management and social science). In the eligibility stage, it was found that most of reported studies are focusing on the hospitality, food service industry and management, and fundamental aspects of food science and technology while less attention has been made on the end consumer which is the main actor of the food industry that determines purchasing decision making throughout the food supply chain. Further, data extraction and analysis were done after the eligibility test according to the systematic review process to identify the most important intrinsic and extrinsic factors that are affecting consumer decision making processes.

Table 1. Keyword used in literature searches.

| Main Database                          | Keyword                                                                 |
|----------------------------------------|-------------------------------------------------------------------------|
| Web of Science and Scopus              | (“food safety” OR “food safety assurance” OR “food quality”) AND (“customer loyalty” OR “customer satisfaction” OR “customer expectation” OR “consumer satisfaction” OR “consumer loyalty” OR “consumer expectation”) |
3. Results and Discussions

Table 1 shows the keywords used in previous literature that have been published in food safety consumer research from the year of 2016-2020. There were only few studies reported with an increasing overall trend in the previous 5 years. The maximum published studies were observed in 2019 and 2018 with eight (8) articles, with slightly decreased reported publications afterwards in the year of 2020 with six (6) articles. In 2016, no reported study was found followed by three (3) related articles in 2017.

![Flow diagram for literature selection. (Adapted from [6]).](image)

Figure 2 shows the result of publication based on first authors’ countries. China reported the highest percentage of publication (36%), followed by Italy (12%), Romania, United States of America (USA) and the United Kingdom (UK) (8%) and other countries. For the most frequently reported publication countries in China and food safety research related to consumers from the other countries, the studies are related to food safety incidents, damage to food brands, supply chain safety and other safety aspects as summarized in Table 2.
Figure 2. Reported publication according to the first authors’ country.

From previous studies in China, researches conducted focusing on food safety incidents, damage food brand, supply chain safety, origin as indicator of quality, safety indicators or cue, sustainability aspect including social, economic, environmental impacts [7, 8, 6, 9, 10, 11, 12, 13]. Literatures from the other countries reported on consumer purchase decisions related on the health, environment and food safety concern, safety incidence (i.e. toxic waste scandal), specific food product safety (i.e. meat product, organic product), food safety policy, labelling and other safety issues. The summary of related literature is presented in Table 2.

Table 2. Food safety issues related to consumer based on first authors’ countries.

| Country  | Issues in food safety studies                                                                 | References                        |
|----------|------------------------------------------------------------------------------------------------|-----------------------------------|
| China    | Food safety incidents, damage food brand, supply chain safety, safety indicators, food related risk, sustainability, health, quality information and traceability. | [7, 8, 2, 9, 10, 11, 1, 12, 13]   |
| Italy    | Environment, food safety and health concern, toxic waste scandal.                                 | [14, 15]                          |
| Africa   | Meat safety.                                                                                      | [16]                              |
| Romania  | Food safety policy, labelling, organic product, and health concern.                               | [17, 18]                          |
| Other countries | Parasites, health concern, hazards control, food safety incidents, production practices, ecosystem, traceability, unsafe handling practices, environmental issues, and animal welfare. | [19, 20, 21, 22, 23, 24, 25, 26] |

Consumer purchase decisions involve psychology which is related to several intrinsic and extrinsic factors such as consumer trust-in-food safety typology and personal characteristics. Intrinsic factors refer to the factor related to the individual consumer, while extrinsic factors refer to the external factor that affect consumer behaviour. It was found that consumer purchase decisions that have been studied are purchasing intention and willingness to pay. Two main factors have been extracted from the literature that influence consumers' purchase decisions were divided into intrinsic and extrinsic factors. Intrinsic factors are consumer characteristics or attitudes, demographic factor, lifestyle, and habit. In addition, the other intrinsic factors are consumer value, trust, perception, and socio-demographic factors. Extrinsic factors influencing consumers purchase decision credence attributes, brand, logo, price, experience, supply chain actor (manufacturer, retailer, supplier, government). The role of the
media and the effect of the food safety scandal. Most of the reported studies involve specific product concerns such as meat product, chicken, milk, and organic product in a specific country. The other study reported consumer perspective from the aspect of health and environmental factors, food scandal issues and damaged food brands, safety policy, product labelling and supply chain safety.

Table 3. Intrinsic and extrinsic food safety factors affecting consumers’ purchase decision.

| References | At | Tr | Ex | Vl | Pc | Pt | If | Kn | Dm | Cp | Fs | Sc | Cm | En |
|------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| [1]        | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [2]        | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [3]        | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [4]        | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [5]        | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [6]        | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [7]        | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [8]        | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [9]        | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [10]       | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [11]       | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [12]       | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [13]       | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [14]       | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |
| [15]       | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  | /  |

At: Attitude or Behavior; Tr: Trust or confidence; Ex: Experience; Vl: Value; Pc: Perception; Pt: Preferences; If: Information; Kn: Food Safety Knowledge; Extrinsic: Ca: Credence or Product Attributes; Fs: Food Scandal; Sc: Supply Chain Actor; Cm: Communication; En: Environmental factor.

4. Conclusion

In summary, the intrinsic and extrinsic factors have been extracted from previous literatures that exert effects on consumers’ purchase decisions. Intrinsic factors that have been extracted are attitude or behaviour, trust and confidence, experience, personal value, perception and knowledge and demographic. Extrinsic factors are product and credence attributes, the occurrence of food safety incidence, role of supply chain actors, communication, and environmental factors. While most of the studies highlight safety issues and food safety incidence in general, only few studies have been done which specify the details of food safety indicators that influence consumer purchase decisions. Thus, future study should highlight on these factors comprehensively to investigate the effect of food safety indicators towards consumers’ purchase decisions.
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