



The perceived value of dairy product traceability in modern society: An exploratory study

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ABSTRACT

The current study assessed the perceived value of food traceability in modern society by young consumers. After experiencing numerous recalls and food safety-related incidences, consumers are increasingly aware of the tools available to mitigate risks. Food traceability has been associated with food safety procedures for many years, but recent high-profile cases of food fraud around the world have given traceability a different strategic purpose. Focusing solely on dairy products, our survey results offer a glimpse of consumer perceptions of traceability as a means to preserve food integrity and authenticity. This study explored the various influences that market-oriented traceability has had on dairy consumers. For example, results show that if the dairy sector could guarantee that their product is in fact organic, 53.8% of respondents who often purchase organic milk would consider always purchasing traceable organic milk. This research produced a quantitative set of information related to the perceived value of food traceability, which could be useful for the creation and development of improved guidelines and better education for consumers. We discuss limitations and suggest areas for new research.

Key words: traceability, dairy foods, value

INTRODUCTION

The simplicity of distribution systems during the preindustrial era suggests that tracing the origins and handling of food products that people consumed was less complicated than it is today. Most food products were locally grown, processed, and retailed, and wholesaling was not as common. The dichotomy between the supply of food and the demands of consumers has only increased due to increasingly complex distribution systems caused by population growth. As a result, consum-

ers today are compelled to trust and rely upon system efficiencies for the assurance that the food products they consume are safe and wholesome (Underdahl and Slater, 2014). Some observers have argued that food safety is at greater risk because of the increasing globalization of food systems (Charlebois et al., 2014). Due to rapid transport and mobility of raw food ingredients and products across the globe, hazards can spread more quickly than in the past; therefore, modern food safety-related incidences can potentially affect many millions of consumers. The commoditization of data and the globalization of information have also had a significant influence on risk perception and consumer preferences (Hoorfar et al., 2011). The growing complexity of food supply chains, the heterogeneity in food safety regulations across countries, and lack of uniform requirements from one commodity to another are some factors that explain why the business case for greater efficiency in food traceability systems has increased in recent years.

The aim of this study was to explore consumer knowledge, attitudes, and practices relating to food traceability with a specific focus on dairy products. It is important to understand fully how food traceability can serve strategic purposes beyond food safety. Our findings provide a factual basis for further investigations and a review of current food policies on traceability.

The Emergence of Food Traceability

Several definitions of traceability are currently in circulation, including definitions used in international standards and references [i.e., ISO 8402 (ISO, 1994), ISO 9000 (ISO, 2000), ISO 22005 (ISO, 2007), and Codex Alimentarius (FAO/WHO, 1997)], in legislations in some regions (e.g., the European Union's General Food Law; Regulation 178/2002), as well as the commonly cited standalone definition used in scientific articles (i.e., traceability as defined by Moe, 1998; Olsen and Borit, 2013; Karlsen et al., 2013). Traceability is commonly defined as the ability to trace products back and forth throughout the supply chain, from farm or point of production to the end user. According to the Codex Alimentarius Commission "The traceability/product

Received December 16, 2014.

Accepted January 9, 2015.

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tracing tool should be able to identify at any specified stage of the food chain (from production to distribution) from where the food came (one step back) and to where the food went (one step forward), as appropriate to the objectives of the food inspection and certification system" (Codex Alimentarius, 2006).

Opara (2003) believes that traceability should include the following 6 main elements: product traceability (physical location of products); process traceability (any type of activity, and the sequence of the activities applied on the product); genetic traceability (genetic formation of the product); input traceability; disease and pest traceability (tracing the epidemiology of pests and biohazards); and measurement traceability (relates individual measurements results to accepted reference standards) (Karlsen et al., 2013). Traceability can be deployed as a tool to answer 6 general questions: "who (i.e., product), what (i.e., product's information), when (i.e., time), where (i.e., location), how (i.e., production practices) and why (i.e., cause/reasons) that are related to food safety, quality and integrity" (Aung and Chang, 2014).

An increase in trade among nations has led to increased focus on food traceability in food products (Olsen and Borit, 2013). The primary reason for this increased focus can be attributed to the numerous tragic and costly food scandals that have received worldwide attention, such as mad cow disease, the Hudson Foods recall in the United States in 1997 (Olsen and Borit, 2013), and the contamination of chicken feed with dioxin in Belgium in 1999 (Bernardet et al., 2002). The outcome of these scandals was the incorporation of traceability into food regulations (Karlsen et al., 2013). The occurrence of bovine spongiform encephalopathy (**BSE**, or mad cow disease) in cattle around the world in the early- and mid-1990s led to mandatory livestock identification and traceability programs in many countries, which resulted in improved confidence with global trading of live animal and related meat products (Charlebois and Camp, 2007). Traces of horsemeat discovered in beef products in 2013 throughout Europe have compelled regulators and consumers alike to question current practices when tracing and tracking ingredients and food products.

The global concern for food safety, authenticity, and quality, as well as the importance of traceability, has resulted in the development of regulations, new international standards, and industry guidelines (Petersen, 2004). In Europe, Directive 178/2002 requires mandatory traceability for all food and feed products sold within European Union (**EU**) countries, which enforces strict regulations on labeling of food products as well as on animal traceability through animal identification and movement program. Every member state of the EU is required to institute and maintain a cattle identifica-

tion and registration system for individual animals using individual ear tags, computerized databases, animal passports that show the history of the animal, and individual registers kept on each holding (Europa, 2011). In 2011, as a part of the Food Safety Modernization Act (FSMA), the USDA introduced an Animal Disease Traceability requirement on livestock being transported across state boundaries. The regulation was finalized in late 2012, requiring that livestock moved interstate needed to be officially identified and accompanied by an interstate certificate of veterinary inspection or other documentation (USDA Global Agricultural Information Network, 2013). Other organizations such as the Codex Alimentarius Commission, established by the Food and Animal Organization of the United Nations (FAO), the World Health Organization (WHO) and the International Organization for Standardization (ISO) have developed international standards and guidelines for food traceability (Petersen, 2004).

The discovery of BSE in Canadian cattle in 2003 led to a border closure for export, and resulted in a \$5.3 billion loss for Canadian beef producers by the end of 2004 (Statistics Canada, 2006). As a result, livestock identification is now a part of animal traceability enforcement in Canada. It requires that cattle, sheep, and bison, and soon caprine to be registered and tagged with identification numbers from birth to slaughter (CFIA, 2014a). Livestock traceability systems are based upon 3 basic elements: animal identification, premises identification, and animal movement. The policy is regulated by Health of Animals Regulations and enforced by the Canadian Food Inspection Agency (CFIA, 2014a). In the latest news release from CFIA, pig farmers and other pig industry custodians are obliged to keep records and report all movements of pigs from birth to import, slaughter, or export. The regulations detail how farmed pigs and farmed wild boars are to be identified. Effective July 1, 2015, the regulations will be extended to include farmed wild boars (CFIA, 2014b). However, for other food commodities in Canada, there are no specific traceability regulations. Traceability of processed food products is verified through proper packaging and labeling, as per the Consumer Packaging and Labeling Act, the Act and Regulations for a food commodity, as well by the Food Safety Enhancement Program (FSEP) of the Canadian Food Inspection Agency for meat products. Federally regulated processing plants must establish hazard analysis and critical control point (HACCP) plans and prerequisite programs and must be able to demonstrate product recall and traceability (F 1.1.1) and product coding and labeling (F 1.1.2) (CFIA, 2013).

Legislations and regulations are not the only driving force behind the increased interest in food traceability.

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