



Traceability in the food supply chain: Awareness and attitudes of UK Small and Medium-sized Enterprises



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ABSTRACT

In this paper the awareness and attitudes towards traceability are examined in the food supply chain (FSC) within UK Small and Medium-sized Enterprises (SMEs). The objective of this paper is to test some propositions found in the literature, and understand whether or not SMEs in the UK are aware of the main objectives of traceability and what importance is given in term of relevance and intention to invest in their traceability systems. This study employed a survey strategy by means of a questionnaire that was sent to food and drink companies operating in the FSC. 146 SMEs answered the questionnaire. Answers were analysed by means of quantitative tools (i.e. contingency tables; Chi-squared test; and Spearman's rank correlation). The findings show that UK SMEs are aware of the main purposes of traceability systems such as recall cost reduction, rapid recalls, and the improvement of food safety and quality, while there is a, misguided, belief that traceability systems can reduce the probability of recalls. The attitude towards traceability is found to be positive in term of recognition of its importance but an unwillingness to invest in traceability systems' enhancement is also found. The findings pose a question mark as to whether or not companies see traceability systems as a strategic tool. This study fills the gap found in the literature where few recent academic papers focused attention on SMEs awareness and attitudes towards traceability in the FSC.

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1. Background

The food industry represents one of the largest manufacturing sectors in the global economy (Fritz & Schiefer, 2009), hence the importance of the Food Supply Chain (FSC). The companies involved in a typical FSC are: (i) primary producer - farmers that grow or breed the raw material; (ii) marketer that store and sell products to producers; (iii) industrial producers - manufacturers that perform some value-adding activities to the raw material such as processing and packaging; (iv) wholesaler – distributors that store and move products between industrial producers and retailers; and (v) retailers - subjects that sale the products to the consumers (Dani & Deep, 2010; Fredriksson & Liljestrang, 2015).

The FSC has experienced substantial changes in the recent years. Roth, Tsay, Pullman, and Gray (2008) have identified three major trends, such as globalisation, consolidation across many food categories at all levels of the FSC, and commodisation where food

products are (i) traded as undifferentiated commodities, (ii) traded in large quantities, and (iii) sourced from global locations, in order to achieve cost minimisation. The three above-mentioned factors are leading towards a FSC based on extensive global sourcing, thus complicating supply chain management, due to an increasing numbers of subjects involved; this can increase the vulnerability of the supply chain and can affect – amongst others – the traceability of food products (Roth et al., 2008). It is found that food safety problems can be associated with a global supply chain, and some of the areas of intervention in order to minimise safety issues can be attributed to traceability systems and recall management (Maruchek, Greis, Mena, & Cai, 2011). Bosona and Gebresenbet (2013) defines traceability “as a part of logistics management that captures, stores, and transmits adequate information about a food, feed, food-producing animals or substances at all stages in the food supply chain so that the product can be checked for safety and quality control, traced upward, and tracked downward at any time”. A recall can be defined as a formal request by a company to its customers to suspend the use of a product in its original form because it represents a danger to customers' health and/or safety, or violates regulations in place (European Commission, 2004).

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The implementation of an effective traceability system can not only allow for compliance with the existing regulation (Storøy, Thakur, & Olsen, 2013) or international standards (Resende-Filho & Hurley, 2012), but may also serve to respond to the fact that food safety is a major concern in terms of public health issues, i.e. the estimated impact of food borne illness in the US is \$ 152 billion per annum, while in the EU the cost of salmonella infections is around € 3 billion per annum (Aung & Chang, 2014). Arguably, compliance with existing regulation does not mean having a higher standard of safety, as it has emerged that voluntary traceability, with specific production rules and controls, allows for higher levels of safety if compared with mandatory traceability (Banterle & Stranieri, 2008). Nevertheless, traceability (being imposed or voluntary) is recognised as a mechanism for safety (Alfaro & Ràbade, 2009; Kher et al., 2010; Regattieri, Gamberi, & Manzini, 2007) and quality (Kher et al., 2010; Lxe, 2011). Moreover, the concepts of quality and safety are often seen as two different faces of the same coin. Aung and Chang (2014) identify three papers (Grunert, 2005; Pinto, Castro, & Vicente, 2006; Rohr, Luddecke, Drusch, Muller, & Alvensleben, 2005) that corroborate that food safety has become an important food quality attribute.

However, some authors state that the role of an efficient traceability system is not to improve product safety or quality, but to enable rapid recalls or withdrawals of products in the event of a food crisis (Folinas, Manikas, & Manos, 2006). This latter idea is at odds with the above-mentioned view that views traceability as a tool for ensuring food safety and quality. Additionally, it has emerged that traceability is not the only tool available to achieve food safety, as contingent payments – payment is lowered if certain quality/safety conditions are not met – can substitute for higher traceability precision, when the aim is to induce a certain level of food safety effort (Resende-Filho & Hurley, 2012).

Notwithstanding the above-mentioned divergent opinions, scholars state that traceability can lead to a cost reduction when recall of hazardous product is needed (Banterle & Stranieri, 2008; Storøy et al., 2013), reduction of liability claims due to the fact that the responsibilities along the supply chain can be precisely identified (Bosona & Gebresenbet, 2013; McEntire et al., 2010), and - thanks to the continuous monitoring of the food supply chain from production to consumption (Aung & Chang, 2014) - to an overall improvement in food crisis management (Bosona & Gebresenbet, 2013). However, it is important to point out that traceability can assist with reducing the consequences of food related crisis, but a lot of literature implies that traceability does not reduce the probability of the occurrence of a food crisis (Bosona & Gebresenbet, 2013; Resende-Filho & Hurley, 2012).

2. Research justification

Recent academic literature has paid little attention to the UK SMEs' awareness and attitudes towards traceability in the food supply chain, considering that internal attitudes and motivations of the company can be seen as a key element as regards the implementation of a traceability system (Donnelly, Karlsen, & Dreyer, 2012).

The scope of this study is to conduct an analysis on the UK SMEs operating in the FSC in order to shed light on their awareness of the above-mentioned main objectives/benefits, and their attitudes towards traceability. This can provides managers with a framework to better understand the full potentials of their traceability systems, in order to lead to an overall improvement of the performances of the traceability practices within the food and drink industry.

3. Theoretical framework

The existing literature allowed the building of a theoretical framework in order to test the awareness of the main purposes of traceability within the UK SMEs in the FSC, as shown in Fig. 1:

The main statements (S) to be tested during the study and reported in Fig. 1 are the following:

- S1: Traceability can lead to a cost reduction when recall of hazardous product is needed (Banterle & Stranieri, 2008; Storøy et al., 2013).
- S2: Traceability enables rapid recall or withdrawals of products in case of food crises (Folinas et al., 2006).
- S3: Traceability (being imposed or voluntary) is recognised as a mechanism for safety (Alfaro & Ràbade, 2009; Kher et al., 2010; Regattieri et al., 2007) and quality (Lxe, 2011; Kher et al., 2010).
- S4: Traceability does not reduce the probability of the occurrence of a food crisis (Bosona & Gebresenbet, 2013; Resende-Filho & Hurley, 2012).
- S5: The improvement in performance of products recall activities can lead to recalls' cost reduction (S5a) and a higher level of safety (S5b) (Bosona & Gebresenbet, 2013).
- S6: The concepts of quality and safety are often seen as two different faces of the same coin. Food safety has become an important food quality attribute (Grunert, 2005; Pinto et al., 2006; Rohr et al., 2005: cited in Aung & Chang, 2014).

The attitudes are tested without prior theoretical constrains/assumptions because no recent academic papers were found as regards the attitudes of UK SMEs operating in the food supply chain.

4. Research methodology

This research employs a mixed mode approach and this approach has the advantage of starting from what it is known and studied in the literature, and then tries to verify it (deduction), meanwhile allowing for less rigidity in order to explore alternative explanations of the phenomenon under consideration (induction) (Saunders, Lewis, & Thornhill, 2012, p. 143–149). This approach fits a research area such as food traceability where much debate is going on without a clear consensus. The findings aim to establish causal relationships between variables, thus supporting the explanatory nature of the study (Saunders et al., 2012, p. 170–172). To form an indication of the current state of belief a cross sectional approach was employed – i.e. study a phenomenon at a particular point in time (Saunders et al., 2012, p. 190–191). This work employs a survey strategy as it was found to be the best method to gather information from a population which is too large to observe directly

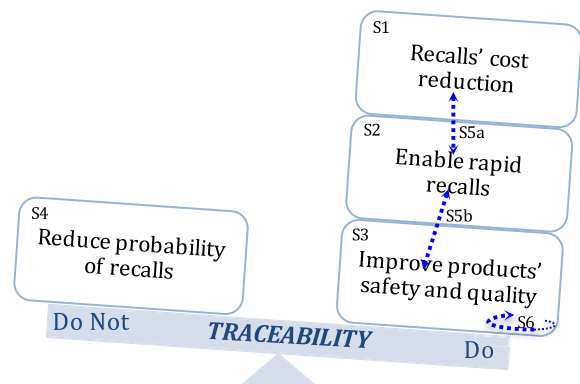


Fig. 1. Theoretical framework illustrating the main purposes of a traceability system in the FSC.

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