

Effective Supply Chain Management Practices in the Food and Beverage Industry: The Role of Traceability and Transparency

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Abstract

Assuring product quality, safety, and sustainability along its supply chain presents challenges for the food and beverage industry. To improve supply chain management procedures, this study investigates the role of transparency and traceability. To be traceable, a product or ingredient must be able to be followed from its place of manufacture to its location of final sale or consumption. The free exchange of information on procedures, methods, and product characteristics throughout the supply chain is referred to as transparency. This paper investigates the role these practices have in enhancing product safety, quality assurance, legal compliance, and customer confidence. The study also looks at how these improve sustainability, cut waste, and lessen hazards. The results of this study offer information to researchers, regulators, and industry stakeholders by emphasizing traceability and transparency as fundamental elements of successful supply chain management. The study had considered sample of 208 respondents from supply chain management department of food and beverage industries and concludes that there is a significant effect of Traceability and Transparency on Supply Chain Management Practices in the Food and Beverage Industry.

Keywords: Beverage, food, supply chain, traceability, transparency, Supply Chain Management Beverage Industry

Introduction

To supply the nutritional requirements of the population of the world, the food and beverage business is essential. However, maintaining the standard, sustainability, and safety of food and beverage items across the entire supply chain is a difficult and complex undertaking. Traceability and transparency have received more attention in recent years as methods to better supply chain

management procedures in this sector. In the food and beverage business, traceability is the capacity to monitor and trace the movement of goods and their components from their place of origin to their site of consumption or final sale. It entails gathering data and keeping records at numerous supply-chain stages, including manufacturing, processing, packaging, distribution, and retail. These specifics cover information on the source of raw materials, processing techniques, storage conditions, transportation, and handling procedures. Firms can swiftly identify and rectify any problems or worries regarding product safety, quality, or authenticity by putting in place robust traceability systems.

Contrarily, transparency entails the open dissemination of information regarding procedures, methods, and product characteristics across the supply chain. It entails giving customers, regulators, and other stakeholders accurate and easily accessible information. Consumers may make educated decisions about the items they buy thanks to transparent supply chains, which allow them to consider aspects like dietary content, sustainability methods, and ethical sourcing while making their purchases. Transparency also encourages stakeholders in the supply chain to be accountable, trustworthy, and cooperative. It is impossible to exaggerate how crucial traceability and transparency are to the food and beverage sector. Maintaining product safety and quality control relies heavily on these procedures. Traceability enables businesses to swiftly pinpoint the issue's origin and take the necessary corrective action in case of a foodborne illness outbreak or product recall. Companies can avoid additional pollution, safeguard the public's health, and reduce financial losses by successfully tracing the product back to its source.

Traceability and transparency also aid in regulatory compliance. Stricter rules are being imposed on food safety and labeling by governments and regulatory agencies all over the world. The information and proof of conformity with these regulations are provided through traceability systems. Companies can gain regulators' trust and show their dedication to upholding industry standards by encouraging transparency. Transparency and traceability are requirements in the beverage and food business that are also driven by consumer expectations and preferences. Consumers today are getting more and more concerned with where their food comes from, how it affects the environment and ethical issues. They want to know where the ingredients come from, how things are made, and what sustainability strategies are being used by the food

industry. Companies can win over customers who value transparency and base their purchasing decisions on their values by offering this information in a transparent manner. Transparent information providers gain customers' trust and loyalty.

But putting into reality efficient traceability and transparency procedures in the beverage and food sector is not without difficulties. The sector's supply chains are frequently complicated, comprising a wide range of technological infrastructure, numerous stakeholders, and an international supplier network. Data integration and harmonization between these various platforms can be a considerable challenge. Additionally, some stakeholders can object because they worry about sensitive information being revealed or because they see traceability and transparency as a disadvantage in the marketplace. Collaboration amongst industry stakeholders, technical developments, and supportive regulatory frameworks will be necessary to overcome the difficulties associated with implementing traceability and transparency systems.

Literature Review

Production of clean and safe food today is no longer a question of choice; it is a requirement. There is a higher knowledge and awareness of rising dangers, safety concerns, and difficulties in beverage and food safety in the present world due to liberalized trade policies promoted in World Trade Organization (WTO) agreements, technological developments, and globalization of food trade. Consumers now demand healthy, safe, and high-quality food and beverage items corresponding to greater understanding. Customers seek assurances regarding food quality; therefore, they demand openness and a quick response to any health issues relating to food. Application of safety standards and food quality as well as supply chain governance systems, or formal agreements between supply chain participants for the exchange of information, could serve as a basis for proving the transparency of the food supply chain (FSC). When it comes to highly perishable foods like dairy and meat, which are prone to quick degradation, traceability is a crucial concern in FSC management. The governments and the food industry, which are the primary players in charge of governing and managing food quality and safety, must have a traceability system that works well to track and monitor food-borne dangers (Pant et al., 2015).

Traceability can be defined as the potential to track a food, food-producing animal, feed, or ingredient expected to be, or intended to be added into, a food or feed through all stages of

manufacturing, processing, and distribution, as per the European Union (EU) regulation 178/2002 (EU, 2002), which specifically limits the definition to the food industry specifically. Traceability is expounded more succinctly by the Codex Alimentarius Commission (CAC, 2005) as the capacity to track the transit of food through specific steps of manufacturing, processing, and distribution. Depending on the area of the food industry, multiple definitions of food traceability are found. Wilson and Clarke (1998) specified food traceability with regard to the food chain centered around agriculture as the data necessary to describe a food crop's production history in addition to any following modifications or procedures that the crop might have been subject to on its way from the farmer's field to the purchaser's plate. According to Dalvit, Marchi, and Cassandro (2007), traceability is understood as a system that can handle trustworthy custody of identity for animal-based goods or animals via numerous connections in the food chain, from the field to the shop.

The foundation for processing, manufacturing, and changing semi-finished goods and raw materials originating from crucial activities like agriculture, zootechnics, forestry, fishing, and so forth is a framework for food supply chain management (FSCM). Three fundamental traits for traceability systems were highlighted by the Food Standard Agency (FSA, 2002), an independent food safety watchdog. All ingredients and products should be identified by their units or batches, and their movement and transformation should be documented, there must be a system for connecting these data, and a traceable resource unit (TRU) is a necessary requirement for an entity to be able to be tracked. Trade, batch, and logistic units are the three different categories of traceable units. A quantity that undergoes the same process is referred to as a batch. I focused more on packs of bottles are examples of trade units, which are delivered from a certain company to the next in a supply chain. The grouping a company makes prior to transit or storage (such as a pallet, container, etc.) is known as a logistic unit, which is a form of trade unit. According to Golan et al., (2004), an effective traceability system must be identified by breadth (the quantity of details or information gathered), depth (how far forward or backward the system traces the necessary information), and precision (the level of guarantee to track down a specific movement of a food item).

The degree to which all a supply chain's stakeholders have a general discernment of and access to the details and information pertaining to the product that they require without noise, loss, distortion, or detainment is the amount to which the chain is transparent (Deimel et al., 2008). Transparency in the FSC has been defined by scholars (Trienekens et al., 2012) in terms of five primary actors or components, including the consumers, government, information systems (ICT), food companies, governance (arrangements), and standards (safety and quality). The mechanisms of governance are a collection of arrangements and agreements between supply chain participants that serve as organizational infrastructure for the exchange of information and are, as a result, a key enabling element for supply chain transparency (Trienekens et al., 2012). Both formal mechanisms of governance—like contracts between supply chain partners—and informal ones based upon trust, reputation, and commitment are possible. The essential information about products and processes is provided by the governance mechanisms. The safety and quality standards that are described in the predefined production standards are crucial components of the transparency network. The integrity of the resources, product, and procedures—all of which should adhere to predetermined specifications—is essential to the flow of information in the context of transparency. “Product integrity” refers to the idea that desirable features are achieved when production procedures and resource usage follow specifications.

Objective

- To measure the effect of Traceability and Transparency on Supply Chain Management Practices in the Food and Beverage Industry.

Hypothesis

- *Null Hypothesis: There is no significant effect of Traceability and Transparency on Supply Chain Management Practices in the Food and Beverage Industry.*
- *Alternate Hypothesis: There is a significant effect of Traceability and Transparency on Supply Chain Management Practices in the Food and Beverage Industry.*

Methodology

The study had considered a sample of 208 respondents from the supply chain management department of food and beverage industries. A specially designed questionnaire was distributed

to the respondents to collect the data using convenient sampling. The analytical and statistical tool, chi square test was used to get appropriate results.

Findings

Respondent’s general details are shared in table below in which it is found that in total 208 respondents males are 61.1% and females are 38.9%. 30.8% of the respondents are below 36 years of age, 42.8% of them belong to the age category of 36-40 years and the rest 26.4% are above 40 years of age. 50.0% of the respondents are from the food industry and the remaining 50.0% are from the beverage industry.

Table 1 General details

Variables	No. of respondents	%age
Gender		
Male	127	61.1
Female	81	38.9
Total	208	100
Age (years)		
Below 36	64	30.8
36-40	89	42.8
Above 40	55	26.4
Total	208	100
Industry		
Food	104	50.0
Beverage	104	50.0
Total	208	100

Table 2 Effect of Traceability and Transparency on Supply Chain Management Practices

Supply Chain Management Practices	Effect of Traceability and Transparency			Total
	Highly affected	Less affected	Not affected	
Food Industry	57	30	17	104
Beverage Industry	52	18	34	104

Total	109	48	51	208
Value of Chi-square				8.896
Degree of freedom				2
p value				.011702

Table above is showing that among 104 respondents from food industry, 57 says that supply chain management practices are highly affected by Traceability and Transparency in food industry, 30 says that it is less affected and rest 17 says that supply chain management practices are not affected by Traceability and Transparency in food industry. Similarly, among 104 respondents from beverage industry, 52 says that supply chain management practices are highly affected by Traceability and Transparency in beverage industry, 18 says that it is less affected and rest 34 says that supply chain management practices are not affected by Traceability and Transparency in beverage industry. Hence, *null hypothesis is rejected, and alternate hypothesis is accepted which says that there is a significant effect of Traceability and Transparency on Supply Chain Management Practices in the Food and Beverage Industry.*

Conclusion

In the food and beverage business, successful supply chain management procedures depend greatly on traceability and transparency. These procedures help to increase consumer confidence, regulatory compliance, quality control, and product safety. They also promote waste reduction, risk reduction, and environmental activities. Strong traceability systems enable businesses to swiftly detect and resolve problems with product quality and safety. In the happening of a foodborne illness outbreak or product recall, this assures the protection of the general public's health and limits financial damages. Traceability systems also offer the data and paperwork required to prove compliance with regulatory requirements, building confidence with regulators and guaranteeing compliance with industry norms. Accountability and cooperation are encouraged among supply chain participants via transparency. Businesses can win over customers by being transparent about their procedures, methods, and product characteristics. It lets customers choose products wisely based on aspects like sourcing that is ethical, sustainability techniques, and nutritional value. Implementing traceability and transparency systems is not without its difficulties, such as complicated supply chain networks and

stakeholder resistance, but overcoming these difficulties is crucial. For the food and beverage business to fully benefit from traceability and transparency, cooperation among industry stakeholders, technical improvements, and supportive legislative frameworks will be essential. Present study was conducted to know the effect of Traceability and Transparency on Supply Chain Management Practices in the Food and Beverage Industry and concludes that there is a significant effect of Traceability and Transparency on Supply Chain Management Practices in the Food and Beverage Industry.

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