

ENHANCING SUPPLY CHAIN MANAGEMENT IN FOOD MANUFACTURING: INTEGRATING PRODUCTION, PLANNING, AND QUALITY CONTROL

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Abstract

In order to improve supply chain management, this article explores the integration of planning, production, and quality control in food manufacturing supply chains. This research investigates how the functioning of food supply chains is affected by the use of standardized quality management system requirements. It also looks at the advantages, difficulties, and approaches related to this integration. A study of the literature offers insights from earlier research on lean concepts, technology adoption, supplier integration, and the use of QMSs in food supply chains. Empirical studies carried out among Polish businesses with well-established quality management systems are part of the study approach. The findings show that quality management systems significantly improve supplier cooperation, quality control, and customer service logistics, among other elements of supply chain operations. The conclusion emphasizes the significance of strategic implementation and suggests topics for further study to maximize the integration of planning, production, and quality control in supply chains for the food manufacturing industry.

Keywords: Supply chain management, Food manufacturing, Production integration, Planning integration, Quality control, Quality management systems, Lean principles.

1. INTRODUCTION

The ongoing advancements in technology and industry rivalry, businesses that want to differentiate themselves from the competition via superior goods and services and a focus on customer demands must work to include critical business processes and management principles. Ahumada and Villalobosa contend that the conventional approach to food supply chain management has to be improved with new the acceptance of this theory offers a foundation for the fusion of contemporary quality management ideas with logistics. In actuality, these ideas

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prioritize the demands of the consumer and enhance organizational internal procedures. As a result, the combination of these lessons with the use of created fixes for the food supply chain ought to raise the caliber of food items. Numerous writers argue that food supply chains in particular should be interested in putting the quality management idea into practice because of the following criteria pertaining to food goods:

- Relatively short shelf life due to physiological and microbiological processes;
- Difficulty in controlling quality parameters because of seasonality;
- Variations and species differences;
- Limited control over preliminary pre-processing of agricultural products.

A further factor supporting the integration of logistics and quality management systems in the food supply chain is the rather intricate and difficult process of figuring out what the needs of the client are. The following facts are the source of this issue's issues:

- Shifts in customer demographics;
- Modifications in consumption patterns brought on by the growing popularity of outside-the-home catering;
- Serving new foods; and Cultural considerations.
- The rise in demand for specialized foods, such as vitamin-enriched, low-fat, high-protein, and vegetarian options.
- It seems that customers are increasingly aware of how diet may impact their overall health and wellbeing, particularly with regard to preventing chronic illnesses. Thus, modern meals should aim to avoid illnesses linked to malnutrition, enhance customers' physical and emotional wellbeing, and satisfy hunger in addition to providing people with the nutrients they need.

2. LITERATURE REVIEW

Zhao, X., Wang, P., & Pal, R. (2021) That's what the outcomes show, with regards to the agro-food store network, provider and interior mix are urgent for further developing item quality. Besides, the connection between provider incorporation and monetary accomplishment as well as the connection between inside combination and monetary execution are both completely

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interceded by the nature of the item. As indicated by this exploration, guaranteeing sanitation and item quality is a useful procedure for working on the monetary execution of agro-food handling organizations. To further develop item quality and accomplish higher monetary execution, agro-food handling organizations could profit from this' how study might interpret the worth creation jobs of agro-food production network coordination and important direction on the most proficient method to deal with the incorporation.

Ben-Daya, M., Hassini, E., Bahroun, Z., &Banimfreg, B. H. (2020) To get a superior comprehension of the potential, snags, and job of IoT and other empowering innovations, such blockchain, on FSC quality administration, we will focus on the FSC, inspect the writing, and do a bibliometric examination. Most of the examination centers on the innovative components of tending to FSC issues. The evaluation likewise shows that there is a lack of exploration on models and choice emotionally supportive networks that utilize Web of Things information to further develop independent direction. The modest number of articles that commonly address these points in activities the executives and related diaries is demonstrative of this. Drawing on the consequences of our appraisal of the writing, we give expected areas of examination that gain by the fast headways in innovation inside the field of FSC.

Reyes, J., Mula, J., &Díaz-Madroñero, M. (2023)An assortment of organizations associated straightforwardly through upstream and downstream worth streams between tasks that collaborate to save costs and waste is known as a lean store network, or LSC. Because of the Coronavirus scourge, which has delivered various up to these point unfathomable disturbances in organic market, supply chains (SCs) are currently being scrutinized. To make a reasonable reference model that joins Industry 4.0 (I4.0) computerized advances with lean assembling devices to limit squander and lessen costs with regards to incline production network arranging (LSCP), a careful examination of develops and multi-primary parts was led in this paper.

3. RESEARCH METHODOLOGY

This publication's primary goal was to investigate how the operation of food supply chains is affected when standardized quality management system criteria are implemented.

The following factors are responsible for the work's selection:

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- There are currently insufficient studies in the literature on how quality management systems affect food supply chains' ability to function.
- The idea of the food chain supply is crucial to modern business operations, both practically and scientifically.
- In the context of customer happiness in the European Union, food product quality is very crucial.
- Through careful integration of logistics and quality management, businesses may create a synergistic effect that greatly streamlines their operations.

In November and December 2015, a set of 38 Polish enterprises who were a part of an integrated food chain and had established and certified quality management systems in accordance with ISO 9001, ISO 22000, or ISO 9004 were the subject of empirical investigations. A questionnaire given to management representatives served as the study method. There were four open questions and twelve closed items in the survey.

4. RESEARCH RESULTS

The survey's findings will be shown in the section that follows. Finding out how introducing quality management systems improved food supply chains was the aim of the first inquiry (Fig. 1.).

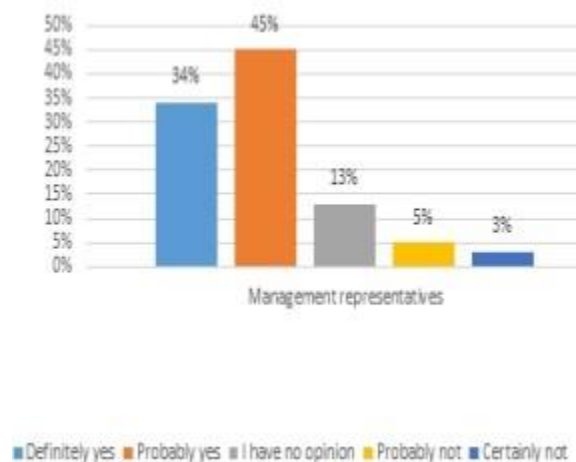


Figure 1: Quality management system affects food supply chain improvement

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The majority of respondents (79%) saw a very big and significant influence from the execution of the system requirements for the development of the food supply chain, according to an analysis of the distribution of responses submitted. The minority of representatives from the groups that failed to mention the benefits (8%) after a thorough investigation, it was shown that the majority of the skeptic organizations were those with only one quality management system in place. Furthermore, these systems—which run from 1 to 3—were just recently put into place. Given that it is well accepted that systems need more time to completely develop inside an organization, this circumstance helps to explain why beneficial benefits have not been noticed in these particular firms.

Furthermore, businesses with two or three established, mature, and integrated systems tend to notice the most influence that these systems have on strengthening the supply chain. Based on these findings, it can be inferred that efforts to create quality management systems are having a beneficial effect on how well logistics operations operate.

Finding out which component of the supply chain is most benefited by the quality management systems in place was the aim of the following query. Fig. 2 shows the distribution of responses.

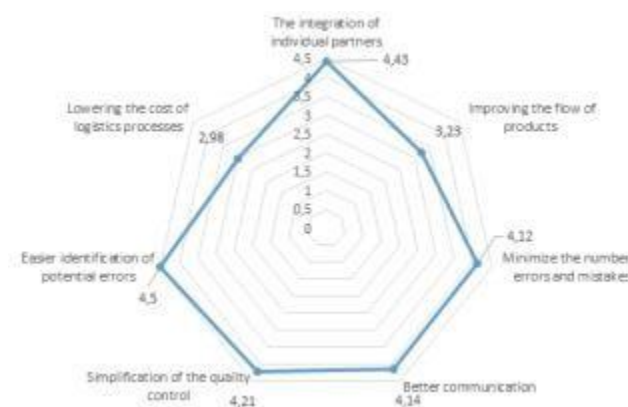


Figure 2: Quality management improves supply chain aspects

According to analysis in Fig. 2, the following domains are most often assisted by quality management systems: Facilitating the detection of any mistakes: this is because the ISO 9001 standard's standards force the business to implement stringent guidelines for the identification of

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components that are acquired. This makes it possible for business owners to swiftly and effectively identify the origin of any issues. Building connections with partners is one of the fundamental tenets of quality management systems. The implementation of shared goals, the sharing of information and technology, and mutual trust boost the efficacy and efficiency with which supply chains operate. Simplifying quality control procedures: Applying and integrating the quality management concept across the supply chain can create stringent protocols for handling products that are moved through the chain, as well as raise individual cell awareness of quality.

5. CONCLUSION

The food supply chain's quality problem is a complicated one. Every logistic subsystem has a specific objective and influences the food product's quality in a unique way. Based on research and analysis, it is possible to conclude that: quality management systems improve food supply chains, particularly in areas like enhancing supplier collaboration, streamlining quality control, and improving customer service logistics; the implementation of quality management systems should be predicated on a carefully chosen strategy that enables an increase in their effectiveness and efficiency; and quality management systems have the least impact on processes that are directly related to the physical flow of products.

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