

# **An investigation into the dynamics of supply chain practices in Dairy industry: A Pilot Study**

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## **Abstract**

In the present competitive era, supply chains within the food processing industry have been subjected to many pressures in the light of globalization, food recalls, technological innovations and decreasing consumer trust. Strategically, rather than competing within low costs market segments, many food producers are following a differentiation strategy that targets niche market segments like organic foods. Though, the food enterprises have reworked on their supply chains but still a lot of work is requisite, especially in case of Dairy industry that has evolved through consistent efforts in India. The prospects proposed by intensive practices call for a comprehensive study about the potential that can be explored for making existing Dairy supply chains more efficient. This study emphases on drafting a supply chain framework where current trends in Dairy sector call for efficient, innovative and competitive supply chains, and also to recognize inefficiency in the Northern region of India. This study is based on the literature assessment of supply chain practices, and pilot studies conducted in select Dairy industry & Cooperative. Findings of study reveals that the Dairy sector need some significant improvements in the area of innovations, traceability, information systems, and process integration so as to achieve their corporate goals.

**Keywords:** Dairy, innovations, pilot study, supply chains, traceability.

## **1. INTRODUCTION**

The supply chain of a business process encompasses the purchase of materials from suppliers, shipping the materials to facilities, manufacture of goods at facilities, shipping the goods from facilities to warehouses and finally shipping the goods to end consumer. Supply chain structure governs the fairness of distribution of value added in chain and resolves the fitness of role players to stimulus their share of value addition. Whereas, the actual structure of an industry governs its ability to manage the competitive forces like the entry of new competitors, bargaining power of buyers, bargaining power of suppliers, threat of substitutes and rivalry among the existing competitors (*Porter, 1998*). A typical food supply chain (FSC) is considered as a composite network of a number of creatures linked from 'farm to fork', such as farmers, input suppliers, cooperatives, pack houses, transporters, exporters, importers, wholesalers, retailers and finally consumers. Efficiency and Sustainability in food supply chains can be realized through innovation, supply chain collaboration, elimination of uncertainties, along with lean and green initiatives (*Mor et al., 2015*). Dairy supply chain consists of four modules as raw milk suppliers, plant, warehouses and the end consumer. The producers, processors and distributors can strengthen their competitiveness and market growth by maintaining the cold chain in an economical way. Moreover, the high perishability of dairy products has resulted in immense food wastages, and food products often require special handling, transportation and storage technologies (*Zhang, Habenicht and Spief, 2003; Lowe and Preckel, 2004*).

'Pilot study' refers to mini version of a full-scale study, as well as the specific pre-testing of a particular research instrument such as a questionnaire or interview schedule. It can refer to so-called feasibility studies which are 'small scale versions, or trial runs, done in preparation for the major study' (*Polit et al., 2001*). However, a pilot study can also be the pre-testing or 'trying out' of a particular research instrument (*Baker, 1994*). One of the advantages of conducting a pilot study is that it might give advance warning about where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate or too complicated. In the words of *De Vaus (1993)* 'do not take the risk, pilot test first.' Pilot studies can be based on quantitative and/or qualitative methods and large-scale studies might employ a number of pilot studies before the main survey is conducted. Section 1 of this paper is the introduction part like supply chains, Dairy industry, pilot study etc.; Section 2 is the comprehensive literature assessment. Section 3 is the scope of study detailing the emergence of theme and objective of

study. Section 4 contains the research methodology; while, Section 5 includes results & discussion with a view to generate common perspective and opinions. Finally, Section 6 is conclusion part.

## 2. LITERATURE REVIEW & ANALYSIS

Keeping in mind the objectives set forth for the study, an attempt has been made in this section to review the available literature which has meaningful relevance to the previous studies conducted in the area of Dairy and food processing supply chains globally as well as in Indian context (Table- 1).

**Table- 1. Analysis of Literature**

<i>Author(s)</i>	Innovation	Traceability	Policy Intervention	Integration	Coordination	Info. & Comm. Tech.	Efficiency	Sustainability
<i>Chandel et al. (2015)</i>			X					
<i>Cosimato et al. (2015)</i>	X							
<i>Mor et al. (2015)</i>	X						X	
<i>Subburaj et al. (2015)</i>			X			X		
<i>Ayodele et al. (2014)</i>							X	
<i>Beske et al. (2014)</i>		X		X				X
<i>Dries et al. (2014)</i>			X					
<i>Farah et al. (2014)</i>			X					
<i>Nicholas et al. (2014)</i>	X						X	X
<i>Verma et al. (2014)</i>					X			
<i>Amorim et al. (2013)</i>								
<i>Arifin (2013)</i>			X				X	
<i>Boudahri et al. (2013)</i>							X	X
<i>Prakash et al. (2013)</i>		X				X		
<i>Mor et al. (2012)</i>			X					
<i>Barbe et al. (2011)</i>	X			X		X		
<i>Kumar et al. (2011)</i>		X			X	X		
<i>Apte (2010)</i>		X				X		X
<i>Balkytė et al (2010)</i>							X	
<i>Berkum et al. (2009)</i>	X						X	
<i>Sagheer et al. (2009)</i>			X			X		
<i>Carraresi et al. (2008)</i>				X				
<i>Sahay et al. (2006)</i>							X	
<i>Taylor (2006)</i>					X			
<i>Issar et al. (2003)</i>	X			X				
<i>Wysokińska (2003)</i>							X	X
<i>Hobbs et al. (1998)</i>					X			

## 3. SCOPE OF STUDY

### 3.1 Problem formulation

Based on the literature assessment, predominating issues in Dairy supply chains comprises innovations, coordination, wastages, sustainability, technology advancement and policy interventions. Further, very few researches have been carried out in Dairy supply chains and there are still many uncovered issues to be explored in Indian context. Many regions like Northern India are still untouched which have been the focal point of the white revolution in 1970s, started with the intension to develop a broad based cooperative offering technological support to the farmers as well as linking them up with rural and urban markets. Hence, the proposed pilot study has been carried out for drafting a framework of efficient, innovative and competitive Dairy supply chains in Northern region of India,.

### 3.2 Objective of study

Following are the objectives of this study:

- To comprehend the dynamics of supply chain practices in Dairy industry.
- To bring out the issues of supply chain practices in Dairy industry.

## 4. MATERIALS & METHODS

### 4.1 Research Methodology

The research methodology of the study undertaken has been systematically designed to ensure the various activities to be carried out (Figure- 1). Following are the steps followed to carry out the pilot study:

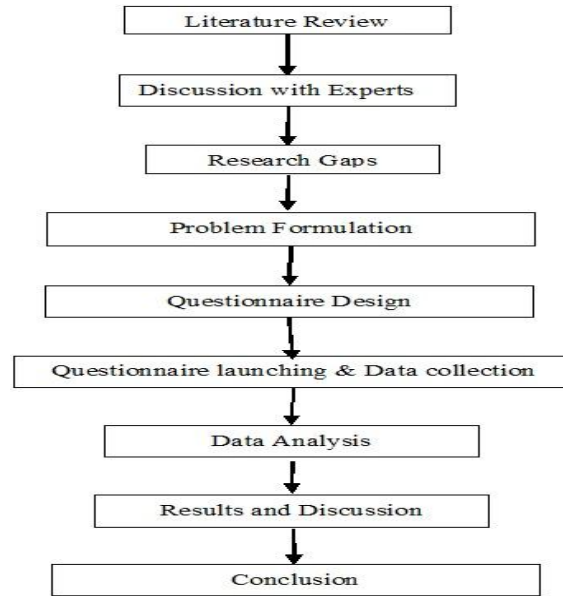


Figure- 1. Research Methodology

#### 4.2 Data collection

The pilot study has been divided into two main groups. First group of participants were the experts from academics & research in the area of operations & supply chain management. The second group consisted of the industry people from Northern regions of India like Punjab, Haryana and Delhi, Himachal Pradesh, and Jammu & Kashmir. Finally, academics experts and industry top management people were contacted to secure participants for the pilot portion of this study. The data from industries was collected through personal visits and probing into the perception of industry people about the predominating issues in Dairy supply chains. Table- 2 shows the data collected from select industries with respect to the issues concluded in literature and some issues that were not in the literature are also given.

Table- 2. Data collected from Industries

Industry	Innovation	Traceability	Policy Intervention	Technology	Wastages	Coordination	Info. & Comm Technology	Infrastructure	Marketing	Inventory	Sustainability	Optimization	Distribution channel	Process Integration
A		X	X		X						X			
B	X	X	X	X				X	X			X	X	X
C			X			X				X				
D	X			X	X	X	X			X		X		X
E	X	X			X		X							
F	X	X		X	X		X			X		X		X
G	X	X	X	X		X		X			X			X
H	X	X					X		X					
I	X	X	X	X		X	X			X		X	X	X
J	X		X	X	X		X	X				X	X	
K		X							X					
L			X			X		X				X		X
M		X		X	X					X	X	X	X	
N	X	X		X			X		X		X	X		X
O	X	X		X				X				X		X
P	X	X			X									

## 5. RESULTS & DISCUSSION

### 5.1 Analysis of Literature

Based on the literature assessment, predominating issues in Dairy supply chains are innovations, policy interventions, sustainability, efficiency, coordination and process integration (Figure- 2).

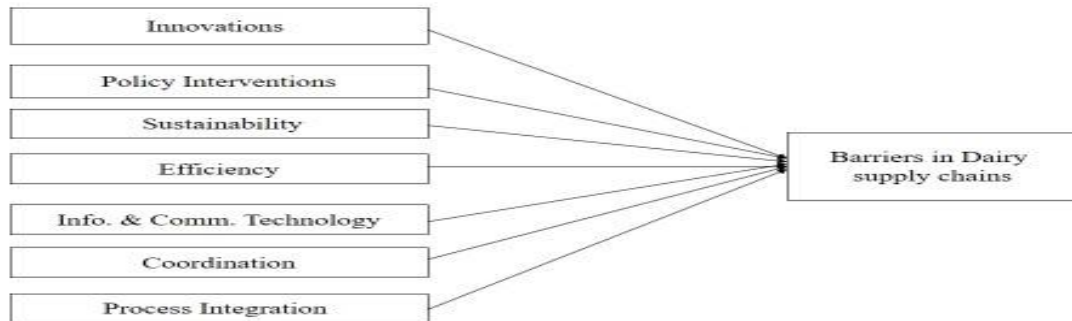


Figure- 2. Barriers from Literature

### 5.2 Analysis of Data collected

Based on the outcome of pilot study, predominating issues in Dairy supply chains are innovations, traceability, technology, wastages, information & communication technology, optimization, process integration and infrastructure (Figure- 3).

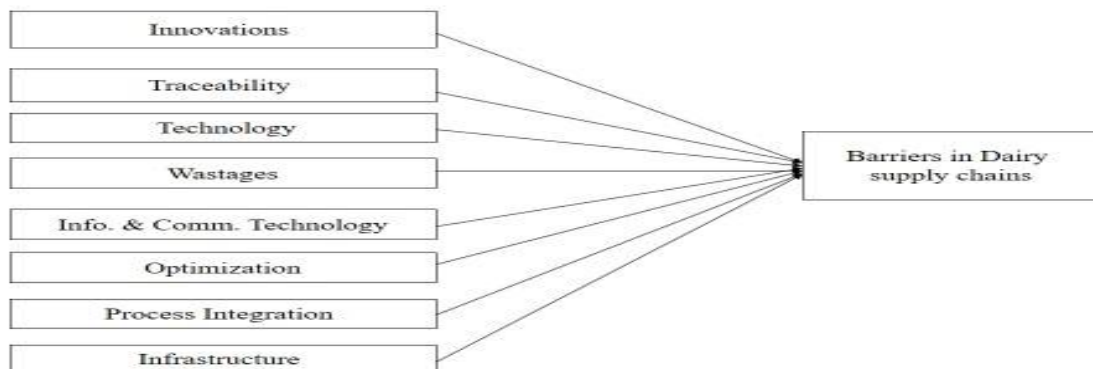


Figure- 3. Barriers from Pilot study

## 6. CONCLUSION

This study reveals that the firms in Dairy sector needs significant improvement in their efficiency and competitiveness status so as to meet high quality, consistency and safety standards of export markets. And these challenges further compels enterprises for significant development in their supply chain practices that gets food from 'farm to fork'. Moreover, the innovations, infrastructural development, technology-process integration, traceability, effective information & communication systems, and control over wastages can assist Indian Dairy industries and cooperatives to set & achieve long-term corporate goals.

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