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Constraints in supply chain of milk in Banda, District of Uttar Pradesh

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Abstract

The current investigation was carried out in Banda district of Uttar Pradesh with the sample size of 120 respondents. The supply chain of milk in Banda, a district located in Uttar Pradesh, faces various constraints that impact its efficiency and accessibility. These challenges include logistical inefficiencies, limited infrastructure, inadequate cold storage facilities, and fluctuating market prices. Small-scale dairy farmers often struggle with inconsistent supply and low productivity due to lack of modern technology and veterinary services. Additionally, the absence of proper transportation systems leads to delays and spoilage, especially during the hot summer months. Further compounding the issue is the fragmented nature of the supply chain, where multiple intermediaries drive up costs and reduce the profitability for both producers and consumers. The socioeconomic obstacles, such as low levels of literacy and restricted access to finance, also hinder the growth and sustainability of the milk supply chain. This study aims to identify and analyse these key constraints in the milk supply chain of Banda, Uttar Pradesh, and suggest potential solutions to improve its overall effectiveness, thereby enhancing milk production, reducing wastage, and ensuring fair prices for both producers and consumers.

Keywords: Milk, supply chain, Banda, constraints, Uttar Pradesh, and Banda

Introduction

In many parts of India, dairy plays a significant part in improving the economic opportunities for households that are small-scale milk producers (Meena *et al.*, 2022) ^[1]. Due to its necessary nutrition and health advantages, milk has been a staple of human diets for generations. The Indian dairy sector is at the vanguard, skillfully adjusting to shifting dietary choices and population development while meeting the always rising demand for milk and its wide variety of products worldwide. Because of this, the manufacturing of milk is an important and prosperous industry in agriculture around the globe. Critical elements including proteins, fat, lactose, vitamins, minerals, enzymes, hormones, immunoglobulins, and cells are all abundant in milk, claim (Nagpal *et al.*, 2018) ^[2]. Because of this, it is the perfect food to improve general health. Around two-thirds of the rural people depend on the livestock sector for their livelihoods, and it plays a vital role in creating jobs within the dairy industry. According to Chellappa and Haran (2018) ^[3] and Jaiswal *et al.* (2018) ^[4], milk production is essential to rural households since it provides one-third of their entire income, guaranteeing both money and nourishment.

The dairy industry employs around 80 million people and is projected to grow to \$355 billion by 2025. According to the National Dairy Development Board, the dairy industry has grown steadily over the past 20 years thanks to programs

like Operation Flood. In 1991-1992, India produced 55.6 million tonnes of milk, with a daily availability of 178 grams. In 2018-19, that amount increased to 187.75 million tonnes, with a daily availability of 394 grams. According to the news announcement issued by the (Ministry of Fisheries, Animal Husbandry & Dairying dated Jun 01, 2021).

Materials and Methods

This chapter discusses the research's methodology, including the selection and description of the study region, sample strategies, data gathering methods, analytical tools, and significant ideas. This study was carried out in Uttar Pradesh's Banda district. A complete list of the villages was obtained from the selected block development office which was 220 in number and out of total village 10 percent which was 20 villages in selected randomly from the selected blocks of Banda district of Uttar Pradesh. Data were collected from 120 farmers. The research methodology plays an important part in the study, focusing on the materials and methods used to analyse logical and statistical data. This study utilizes a combination of qualitative and quantitative approaches, incorporating focus groups, interviews, and surveys, and data analysis techniques to fulfil the goals. Primary data was collection on the basis of interview of respondents and Secondary data collection will be collected from research book, journals, website, publication, research paper.

Sampling Structure/design

Multi- stage sampling technique was used. Selection of

district was purposively and block, villages, and respondents are randomly.

Table 1: Details of sampling technique in studied area (Banda district of U.P.)

S. No.	Stages	Sampling Area	Sampling Method
1.	Stage I	Selection of district	Purposively
2.	Stage II	Selection of block	Purposively
3.	Stage III	Selection of villages	Randomly
4.	Stage IV	Selection of respondents	Randomly
5.	Stage V	Selection of market	Purposively
6	Stage VI	Selection of market functionaries	Randomly

Herd size of the respondents

There are three different cattle herd sizes in the research region, some of which are

1. Small herd size (< 5 livestock)
2. Medium herd size (5-10 livestock)
3. Large herd size (> 10 livestock)

Analytical tools

Garrets Ranking method was employed to examine the respondents' production and marketing limitations. At various stages of manufacturing and marketing, manufacturers encountered several limitations. Producers were requested to relist the restrictions based on their relative relevance once they had been listed. These restrictions were then transformed into rankings using the provided methodology.

Percent Position= $100 (R_{ij} - 0.5)/N_j$

Where,

R_{ij} = rank given for i th factor by j th individual;

N_j = Number of factors ranked by j th individual.

The percent position of each rank was converted into rank based on table given by Garrett (Garrett and Woodworth, 1969).

Results and Discussion

Constraints refer to the issues or challenges that dairy producers have when using animal husbandry techniques in their dairy business. In this study, the term "constraints in milk production and disposal" refers to any social, economic, or organizational obstacles that, either separately or in combination, prevent farmers from adopting scientific dairy farming techniques. Two types of restrictions are examined: those related to milk production and those related to milk marketing.

Table 2: Constrains face by milk producer (respondents) at different stage of milk supply chain in study area

S. No	Problems faced by producer	Garret Score	Rank
1	High cost of feed and fodder	58.97	I
2	Problems in marketing of raw milk at reasonable rate	55.56	II
3	Less availability of quality green fodder	54.7	III
4	Lack of veterinary facilities	54.11	IV
5	Lack of artificial insemination facilities	54.35	V
6	Inadequate knowledge about balanced feeding	54.18	VI
7	Low productivity in local Milch animal	53.76	VII
8	Transportation	53.59	VIII
9	Less selling place	52.14	IX
10	late payment	50.42735	X

High cost of feed and fodder (Garret Score: 58.97, Rank: I)

The first major issue facing the fresh milk supply chain is feed and fodder. The poll found that issues in the milk supply chain are caused by a lack of feed and fodder, as well as by the high cost and poor quality of fodder. According to the poll, 58.97% of farmers use dry feed for their animals, and due to the population growth, relatively few farmers utilize green feed. Farmers are compelled to produce more grains and vegetables due to the increasing demand for these products. As a result, farmers are giving their animals dry feed, which lowers milk output. As a result, farmers make no money. Shopkeepers may put contaminants into feed, resulting in poor quality feed and fodder, which causes frequent animal illnesses and issues for milkmen.

Problems in marketing of raw milk at reasonable rate (Garret Score: 55.56, Rank: II)

Raw milk prices can fluctuate widely depending on supply and demand, seasonality, and market conditions. According to survey 55.56% farmers face problem for instance, during peak production seasons (like the summer months), milk supply increases, and causing prices to drop. Conversely, in off-seasons, when milk is scarce, prices can rise drastically. This unpredictability makes it difficult for farmers to plan their finances and for consumers to pay consistent prices.

Less availability of quality green fodder (Garret Score: 54.7, Rank: III)

The less availability of quality green fodder can significantly impact dairy farming, affecting milk

production, animal health, and overall farm profitability. According to study 54.7% farmers has common problem in study areas with limited land for cultivation, unpredictable weather conditions, and poor access to irrigation or quality seeds.

Lack of veterinary facilities (Garret Score: 54.11, Rank: IV)

The lack of veterinary facilities is a significant constraint in dairy farming, especially in rural and remote areas. According to survey 54.11% had absence of adequate veterinary services leads to a variety of issues that negatively impact animal health, milk production, and farm profitability. Below are the key problems associated with the lack of veterinary facilities, followed by potential solutions.

Lack of artificial insemination facilities (Garret Score: 54.35, Rank: V)

According to survey 54.35% of farmer was face problem of lack of artificial insemination (AI) facilities is a significant constraint in dairy farming, especially in rural and remote areas. AI is a key technology for improving the genetic quality of livestock, enhancing productivity, and controlling reproductive diseases. Without access to AI services, farmers are often limited to natural breeding methods, which may lead to lower productivity, increased disease risks, and a slower rate of genetic improvement in herds.

Inadequate knowledge about balanced feeding (Garret Score: 54.18, Rank: VI)

Inadequate knowledge about balanced feeding is a significant issue in the study area. According to survey 54.18% of dairy farmers face problem, particularly in rural or resource-constrained areas. Proper nutrition is critical for the health, productivity, and longevity of dairy animals and a lack of understanding of balanced feeding practices can lead to poor milk yields, health issues, and inefficient use of resources. Farmers who don't understand the nutritional needs of their animals may struggle with low productivity, high veterinary costs, and poor reproductive performance.

Low productivity in local Milich animal (Garret Score: 53.76, Rank: VII)

The biggest issue facing milkmen in the fresh milk supply chain is animal-related. According to the poll, 53.79% of farmers deal with a variety of livestock problems, including poor nutrition, fever, animal mortality, and other infections. Milk production drops when an animal has a fever, and the milkman does not make any money. According to the report, animals occasionally have several health issues that cause them to abruptly pass away from a lack of adequate facilities and nutrients.

Transportation (Garret Score: 53.59, Rank: VIII)

The biggest issue facing milkmen in the fresh milk supply chain is transportation. The poll found that 53.59% of milkmen had to deal with a number of issues, including poor road conditions, high fuel prices, a lack of a transit system, and expensive transportation costs. Milkman suffered since he made less money as a result of the increased expense of transportation. Because of the limited transportation

infrastructure in some areas, milk delivery takes longer, which occasionally results in milk destruction. Fuel prices are high, which raises the cost of transportation and reduces milkman earnings.

Less selling place (Garret Score: 52.14, Rank: IX)

As a result of fewer selling locations 52.14 percent of milkmen had trouble getting fresh milk from the countryside to the city. Milkmen have difficulties during transportation as a result of the high cost of transportation as well as loading and unloading fees. Some farmers pack their bicycles with fresh milk, ride to the market, and then take a bus to the city, according to the poll. Milk was occasionally destroyed by lengthy transit times, which caused issues for farmers and reduced their profits.

Late payment (Garret Score: 50.42735, Rank: X)

According to survey 50.42% farmer face problem of late payment in dairy contracts refers to the failure of a party typically a buyer or a processor to pay for milk or dairy products within the agreed-upon timeframe. In the dairy industry, where payments are often due weekly or monthly, late payments can disrupt cash flow for farmers and affect the operations of processors or retailers as well.

Conclusion

In the study revealed that producers faced several major challenges, including limited selling locations, poor transportation systems, animal health issues, high feed and fodder costs, inadequate medical care, significant marketing losses, lack of marketing information, and various problems within the milk supply chain. For retailers and wholesalers, the primary issues in fresh milk marketing were high price fluctuations, poor coordination between producers and intermediaries, the absence of technical guidance, and substantial marketing losses. Consumers encountered difficulties such as the lack of grading facilities, inadequate packaging, and unhygienic conditions when purchasing fresh milk from different supply chains.

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