



Perception of Urban Consumers on Dairy Farming and Milk Consumption in North India

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ABSTRACT

Increasing commercialization of dairy farming, diversity of products, consumer awareness and unlimited access to various information might have influenced the perception of consumers which finally affect their purchasing behaviour. Present study attempts to study the perception of consumers on dairy farming and milk consumption by analysing primary data collected from 270 milk consuming households using a Perception Index constructed for the purpose. The overall perception index was estimated to be 68, indicating that consumers have a favourable perception of milk consumption and dairy farming. Consumer households had higher positive perception on nutrition and health effects of milk (79.33) and economic benefits of dairy farming (77.56). However, they were concerned about milk safety (53.54) and ethical aspects (57.03). Stringent quality control, inspection and monitoring are required for ensuring safe milk so that the apprehensions in the mind of consumers can be removed. Efforts also needs to be directed towards animal welfare.

INTRODUCTION

Dairy farming has been an integral part of the Indian agriculture since ages. It occupies a significant position owing to its major share in Gross Domestic Product of livestock sector besides being a source of livelihood for millions of rural households (Das et al., 2020; Gupta & Sharma, 2010; Lalrinsangpuii et al., 2016). In addition to income, dairy also ensures food and nutritional security of households (Smith, 2013). Milk and milk products are an essential constituent of traditional Indian diet. They serve as a major source of protein primarily for the vegetarian population, children and pregnant women.

Traditionally, dairying was practiced for subsistence but the Operation Flood, which provided the impetus for India's white revolution, gave a significant boost to commercialization and the farmers started focusing on increasing the productivity of their dairy farm. High milk yielding crossbred, artificial insemination,

scientific methods and better-quality fodder were introduced for making the country self-reliant in dairy production (Sarveswara & Rao, 2021). Since then, the dairy production systems are continuously changing with sustained economic growth, growing urbanization and improved technologies. Commercial dairy farms have no doubt helped in ensuring milk self-sufficiency of the country, however, critics argue that intensive dairy farming have its own demerits too (Kirchhelle, 2018). Sole emphasis on milk production may lead to compromises with the environment, food safety and animal welfare (Cornish et al., 2016; Polsky & von Keyserlingk, 2017; Fraser et al., 2013) but the Economic, socio-psychological, marketing and technical constraints dominates the scenario Singh et al., (2017).

Besides change in production system, the preferences of consumers are also changing owing to changing lifestyles and rising health consciousness (Chen, 2009). The dairy market now offers a variety of milk like cow milk, desi cow milk, organic milk, low

fat milk etc. in order to cater the specific requirements of the consumers. Additionally, a number of products including health drinks, fortified foods and dairy analogues are also available in the market. All these changes clubbed with instances of milk adulteration and access to huge amount of verified as well as unverified information may influence the perception of consumers on dairy farming and milk consumption (Maiti & Saha, 2022). Purchasing decisions of consumers are usually based on their perceptions. This process is particularly critical for dairy products for which the consumers' perception may change rather swiftly (Atabek & Atabek, 2019). A detailed examination of the contemporary consumers' perception of milk and its importance is essential for development of dairy sector. This kind of study may reveal the priorities of general public as well as identify potential areas of concern that, if not addressed, could jeopardize the future viability of the dairy sector (Cardoso et al., 2016). With this backdrop, the present study attempts to assess the perception of urban consumers on dairy farming and milk consumption.

METHODOLOGY

Multistage random sampling technique was used in the study. At the first stage, North India was purposively selected as it is the major milk consuming region of the country. North India consists of four states (Punjab, Haryana, Himachal Pradesh, Uttarakhand, Uttar Pradesh) and four union territories (Jammu & Kashmir, Chandigarh, Ladakh and Delhi). A list of Tier-1, Tier-2 and Tier-3 cities of North India was compiled and one city was randomly selected from each tier. New Delhi, Ludhiana and Karnal were the randomly selected cities from Tier-1, Tier-2 and Tier-3, respectively. Thereafter, three clusters were randomly selected from each city. Finally, 30 milk consuming households were randomly selected from each cluster thus constituting a total sample size of 270 milk consuming households.

Perception for the study was operationally defined as the way milk consumers feel, understand, and interpret the utility and quality of milk as well as the effect of dairy farming on economic, environmental, and social aspects. The attitude of respondents towards dairy farming and milk consumption was assessed by using a perception index which was constructed based on a five-point Likert scale developed for the purpose. Five parameters – nutrition and health effects (the extent to which milk is perceived as a nutritious and healthy food), safety concerns (the level to which available milk is believed to be safe for consumption), economic benefits (perceived importance of dairy farming in relation to the country's economy), ethical concerns (the level to which contemporary dairy farming practices are regarded as ethical), and environmental effects (the degree to which dairy farming practices are considered as environmental friendly) – were used in the study. A total of 32 statements were selected through expert opinion for assessing the perception out of which 10 statements related to nutrition and health effects, 6 from safety concerns, 4 from economic benefits, 7 from ethical concerns and 5 from environmental effects were considered as the most relevant. During survey administration to the respondents, these statements were rated on five-point continuum strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), and strongly agree (5). Thereafter,

Perception Index was calculated by using the following formula (Chatterjee & Mondal, 2022):

$$\text{Perceived attributes of perception index} = \frac{\text{Sum of actual score obtained}}{\text{Sum of maximum possible score}} \times 100$$

$$\text{Perception index} = \frac{\text{Nutrition and health effects} + \text{safety concerns} + \text{economic benefits} + \text{ethical concerns} + \text{environmental effects}}{5}$$

Data were collected by personally interviewing the respondents using a pretested structured schedule between February, 2022 and April, 2022. The responses were recorded and tabulated before carrying out required statistical analysis.

RESULTS AND DISCUSSION

Findings related to the perception of milk consumers on milk and dairy farming are presented in Table 1. The value of overall perception index for dairy farming and milk consumption was calculated as 68. A higher perception index score indicates that dairy farming and consumption of milk were positively perceived by the consumers. Consumer households had a more favourable perception of the nutrition and health effects of milk (79.33), economic benefits of dairy farming (77.56) and its environmental effects (72.64) than of the milk safety (53.54) and dairy related ethical issues (57.03).

Nutritional and health effects of milk

Majority of the respondents perceived that milk is essential for the proper development of children as well as for maintaining strong teeth and bones. They agreed that milk should be consumed by pregnant women and it is essential for leading a healthy life. Moreover, they believed that milk neither have any negative health effects nor its regular consumption is linked with diabetes and heart disease. Milk has been considered as a complete and healthy food (Upadhyay et al., 2014; Herber et al., 2020; Rai et al., 2020) and the findings of this study corroborates it. However, some of the respondents did not consider fat present in milk as healthy. Conducting research in this area followed by subsequent dissemination of scientific facts may help in clarifying the doubts of consumers. Respondents had neutral perception regarding linkage of milk with obesity and necessity of milk consumption for adults.

Safety concerns regarding milk

Unlike perception on nutritional and health benefits of milk, perception of consumers on milk safety was not very positive. Most of the respondents felt that a major amount of milk available in the country is unsafe for consumption and milk adulteration is a serious problem during festivals. They also perceived milk contamination due to antibiotic and pesticide residues as an emerging problem. However, they were neutral on considering milk as one of the most adulterated food products. Among organized and unorganized sector, respondents agreed that branded and packed milk are safe and adulterant free but they didn't trust milk vendors selling loose milk. The consumers generally perceive packaged food items of reputed brands as safer than the unpackaged products

(Gavaravarapu et al., 2009) while even packaged products have been found adulterated (Rai et al., 2020). Moreover, instances of adulteration by milk vendors especially in the urban areas have also been reported (Gupta et al., 2013; Singh et al., 2016). This indicates that strict actions are required on urgent basis for ensuring availability of pure and non-adulterated milk.

Economic benefits of dairy farming

The importance of dairy farming to India's economy was acknowledged by the respondents. They unanimously agreed that it is an important source of income for small and marginal farmers

and dairy exports benefit the economy. They also felt that government should promote dairying as it provides employment and livelihood. They believed that dairy farming is a tool for development of rural areas and it guarantees sustainable livelihood for the rural communities. This shows that consumers are aware of the economic significance of dairy farming and support Government efforts for its promotion.

Ethical concerns related to dairy farming practices

Although respondents firmly agreed that milk consumption raises some ethical concerns, they also held the opinion that there

Table 1. The attributes of milk and dairy farming as perceived by the milk consumers

S.No.	Attributes perceived by respondents	Mean perception scores	Standard deviation	Perceived attributes index
Nutrition & Health effects				
1.	Milk is essential for proper development of children.	4.50	0.50	89.93
2.	Milk should be consumed for maintaining healthy teeth and bones.	4.49	0.50	89.70
3.	Regular consumption of milk is essential for leading a healthy lifestyle in the modern world.	4.56	0.50	91.19
4.	Milk consumption is necessary even for adults.	3.12	0.81	62.37
5.	Regular consumption of milk & milk products can't lead to obesity.	3.00	0.82	60.00
6.	Regular consumption of milk & milk products can't lead to diabetes.	4.53	0.50	90.59
7.	Regular consumption of milk & milk products can't lead to heart disease.	4.50	0.50	90.07
8.	Milk consumption is necessary for pregnant women.	4.01	0.82	80.15
9.	Fat present in milk is healthy.	2.49	1.12	49.78
10.	Milk does not have any negative health effect.	4.48	0.50	89.56
	Average nutritional & health effects index			79.33
Safety Concerns				
11.	Majority of the milk available in India is safe for consumption.	1.44	0.50	28.81
12.	Antibiotic and pesticide residues are not emerging as a problem in the case of milk.	2.05	0.82	41.04
13.	Milk adulteration is not a serious problem during festivals.	2.11	0.82	42.22
14.	Milk is not one of the most adulterated food products.	3.03	0.83	60.52
15.	Branded and packed milk are safe and adulterant free.	3.40	1.06	68.07
16.	Milk vendors in India are not reliable and they adulterate milk with harmful chemicals.	4.03	0.79	80.59
	Average safety index			53.54
Economic benefits				
17.	Government should promote dairying as it is an important source of income and employment.	4.04	0.81	80.74
18.	Dairy helps in providing income to the small and marginal farmers.	4.51	0.50	90.30
19.	Dairy does not promote rural development and ensures sustainable rural livelihood.	2.44	1.11	48.74
20.	Export of milk and other dairy products positively adds in the Indian economy.	4.52	0.50	90.44
	Average economic benefits index			77.56
Ethical Concerns				
21.	There is no harm in rearing dairy animals for commercial purpose.	4.01	0.84	80.30
22.	Rearing of old cattle is not a burden for family.	3.01	1.37	60.15
23.	Sufficient space is available for animals in dairy farms.	1.98	0.83	39.56
24.	Artificial insemination should be done for improving milk yield.	3.03	0.80	60.59
25.	Male dairy animal should not be reared as they are not profitable.	1.50	0.50	29.93
26.	Animals/ Breeds having lower productivity should not be reared.	2.40	1.13	48.00
27.	There is an ethical concern in drinking milk of dairy animals.	4.03	0.79	80.67
	Average ethical concern index			57.03
Environmental effects related to dairy sector				
28.	By-products of dairy are important for organic agriculture and for generating renewable energy.	4.53	0.50	90.59
29.	Dairy farming has no negative effect on environment.	3.03	0.82	60.52
30.	Poor handling of dung and other waste does not degrade local resources	4.04	0.81	80.74
31.	Milk has less water footprint than plant-based foods.	3.02	0.82	60.44
32.	Dairy farming does not contribute to greenhouse gas emissions.	3.54	1.12	70.89
	Average environmental effects index			72.64
	Overall Perception Index			68.02

is no harm in raising dairy animals for commercial purposes. This demonstrates the necessity to balance increased productivity with consideration for animal welfare. Moreover, consumers felt that sufficient space is often not available for animals in dairy farms. They deemed it unethical to abandon male animals even if they didn't generate returns and supported rearing of breeds with low productivity too. Nevertheless, they have mixed perception regarding rearing of old cattle and use of artificial insemination for improving milk yield. These results indicate that society in general cares about animal welfare. Treatment of animals in modern farms has often been identified as a cause of concern mostly by the consumers in western countries and majority of them did not support dairy practices responsible for loss in animal welfare (Hotzel et al., 2017; Boogaard et al., 2011). However, it might be interesting to study whether consumers would also be willing to pay more for improved levels of animal welfare.

Environmental effects of dairy farming

Consumer assessment of dairy farming's effects on the environment was largely favourable. They unanimously agreed that by-products of dairy farming are crucial for organic farming and they can be used to produce sustainable energy. They contend that improper handling of dung and other waste doesn't degrade local resources. Dairy production was not considered as a source of greenhouse gases. They were indifferent on negative environmental effects of dairy farming and water footprint of milk. This might be due to limited awareness of the detrimental effects of dairy farming on the environment. Lack of awareness of the association between food consumption and environment has also been reported in some of the past studies (Macdiarmid et al., 2016; Hartmann & Siegrist, 2017).

CONCLUSION

The overall perception of milk consumers on milk consumption and dairy farming was positive. They perceived nutrition and health effects of milk favourably but they rated milk and dairy farming relatively lower on safety and ethical aspects. Some of the consumers were concerned about the fat present in milk and did not consider it as healthy. Scientific studies recommending the right amount of milk fat in the context of present lifestyle may help in driving out this fear. Milk adulteration was a serious concern and greater importance needs to be given to it at all levels, including production, marketing, extension services, and policy advocacy. Dairy sector has a significant place in country's economy thus government programs supporting it are justified but focus needs to be directed towards animal welfare also along with increasing production. It may be promoted by implementing certification system for welfare farms in near future. Further, increased awareness of the environmental impact of dairy might provide a boost to sustainable practices.

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