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NAVIGATING DIGITAL FRONTIER: FACTORS INFLUENCING SUPPLY AND DEMAND OF FRESH MILK IN PAKISTAN

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Abstract

Understanding market forces that shape up supply and demand of fresh milk. This research study is essential for smooth milk production and its consumption particularly in case of emerging economies. Therefore, this study analyzes those factors that influence the market forces: consumption and production of fresh milk in Faisalabad, Pakistan. To achieve the objective, we used multiple linear regression technique to determine the effect of determinants influencing production and consumption. Results of this research article revealed that the fresh milk demand was positively influenced by consumer's educational background, fresh milk price, consumer income, family size, and family expenditures along with use of ICTs. Our study also depicted that the fresh milk production was influenced by factors such as credit facility, the strength of milking animals, sale price, concentrate value, farming experience, labor costs, fodder value, and ICTs. The study concluded that any intervention that aimed at smooth milk production and consumption should facilitate consumers and producers' access to ICTs, reduce prices of fresh milk and provide access to credit. Furthermore, while devising policies, the government should focus more on consumers with large family sizes and illiterate households to overcome the problem of food security.

Key words**:** *market forces, ICTs, milking animals, emerging economies, food security*

INTRODUCTION

Pakistan is an agrarian country where agriculture plays a significant role in the economy. The livestock sub-sector is the largest contributor to the agricultural sector, accounting for 55.1 percent of the total contribution. Livestock in Pakistan primarily includes buffaloes, goats, and cows, which provide various products such as milk, hides, and other raw materials [37; 46].

Milk is the most important product of Pakistan's economy as it is the third-largest milk-producing country in the world. Over 10 billion farm families in Pakistan produces nearly 40 billion liters of milk annually, equating to 11.3% of total GDP production. Despite this, the production of milk is not to the level of Pakistan's actual potential which is US$5.64bn in 2023. According to CAGR 2023-2028, this market is projected to raise by 6.50% per annum [41]. Local businesses deliver nearly 80% of the milk, while urban one's form only 20% of the milk-producing sector.

The key limitation in Pakistan's milk production is the uneven milk distribution in rural and urban regions due to the non-existence of organized dairy farming [44; 45]. It is estimated that nearly 3% of the milk is supplied with the help of an organized channel, whereas 97 % continues to be distributed through traditional distribution channels involving middlemen [40].

The 'Katcha dodhies' use to gather milk from rural regions and sell it to domestic businesses or 'pakka dodhies.' The 'pakka dodhies' then distribute milk to retailers, dairy processors, and merchants in urban cities. The 'glass specifically supply milk to the countryside and urban regions. In Pakistan, such milk distribution and production strategy desperately need a makeover, since, nearly 15-19% of the marketed milk is wasted due to an ineffective cold chain storage systems and supply facilities [36]. Moreover, per capita

milk utilization in Pakistan is imperfect due to a mismatch between the vested interests of milk production and supply [38; 23].

Dairy products are an essential part of the Pakistani diet, and milk is considered a major dairy product. Milk offers numerous long-lasting benefits, including promoting bone health, reducing the risk of cardiovascular and blood pressure diseases, aiding in weight management by combating obesity, and being effective against type 2 diabetes, cancer, and dehydration [42; 17; 47]. The consumption of dairy products, including milk, meat, and eggs, is widespread in Pakistan and plays a crucial role in meeting nutritional needs and maintaining a balanced diet for people of Pakistan.

Furthermore, the milk production levels are substantially affected by diverse interests during low production time. Low milk yield may be the result of multiple factors, including poor administration. Several scholars [19; 18; 7; 4; 15; 16] have provided an insight on the reasons that affect production and consumption of livestock and agricultural merchandises, generally.

However, limited researches [18; 20; 3; 48] has solely been conducted on the milk sector. Critical factors such as mulching animal's number, i.e., source of milk supply, price of milk produced and a product substitute have been unclear considered. Also, not enough studies have been conducted to understand the supply and demand for milk in Pakistan.

Literature review

Dairy and Livestock Production in Rural Areas of Pakistan is Segregated. Small-holder subsistence (1-5 animals), small-holder market oriented (5-15 animals), and rural commercial with more than 50 animals (typically 90% buffaloes & 10% cows) are the three dairy and livestock production systems commonly employed in rural areas [35;11].

Farming families drink milk and sell excess milk to other consumers, i.e. milk left over after household consumption. In the animal herd, male and female calves typically nurse the dams and are held during the lactation phase. Male calves with the best breed qualities are traditionally preserved for breeding, while other male calves are slaughtered and considered for beef production. Because the sector is un-organised and dispersed, it is difficult for farmers to receive technical help and business development services connected to enhanced livestock production [35].

The increase in milk production in Pakistan in recent years is primarily attributed to an increase in the total number of animals rather than improvements in productivity per animal. There are several reasons for the lower productivity levels [1].

Consumers, now a days, especially in big cities of Pakistan are ready to pay more for pasture-raised milk than for conventional milk, suggesting a trend towards goods with additional benefits exceeding organic and fresh milk [19]. At this point, there's currently no in-depth understanding of the mindsets that lead to this behavior. For marketing, the main purpose is to successfully contact consumers. But it is critical to understand their values, psychology and motivations [42; 29].

Greater consumer knowledge about the environment, livestock welfare, and human health impacts traditional and unconventional dairy production systems. It may influenced consumer attitudes and motivated them to choose pasture-raised milk products. A possible technique for increasing milk sales is to enhance consumer interest in production systems and their desire to understand more about the source of their food and its effect on environment they belong to [10; 2; 20; 39].

Purchase patterns are beneficial in analyzing customer behavior. Customers are typically devoted to the most easily accessible locations that meet their food and milk needs. Furthermore, multiple categories of consumers can be reached at the same location. As a result, marketing efforts for milk related products should be customized to the mood of the retail location while conveying a message broad enough to reach the majority of buyers [12; 10;14].

The food market is changing around globally, specifically in developing nations. This variation improves consumer`s quality of life, which influences lifestyle evolution and global consumption trends. It is significant to discover a link among environmental factors

and personal factors that determine milk consumption. Therefore, dairy companies have useful solutions and strategic plans to grow their business digitally [30; 28].

More than 6 billion milk and dairy products consumer`s live in developing countries. Therefore, milk production must increase by about 22% every year, if we want to sustain demand. An estimated 150 million households are involved in milk production, universally. Small farmers lived in most developing countries produce milk which result in contributing food security, nutrition and domestic income. For small producers, Milk generates swift revenue comparatively. Hence, result in an imperative cash flow. In last thirty years, Global milk production has grown up by 50% or more. It is on record that in 1983 milk production increase from 500 million tons to 769 million tons in 2013 [13; 26; 31]. "

The purpose of the paper

In this context, this study aims to understand factors related to the production and consumption of milk in Pakistan, which will help devise policies to reform the demand and supply framework in the future. This study can be seen as a good standpoint to begin research in the region and contribute strategies to enhance milk production and distribution in Pakistan.

MATERIALS AND METHODS

The current study is based on data collected by concluded a pretested survey that involve 100 dairy farmers and 100 customers of dairy from Tehsil Faisalabad. A convenient sampling method was used to collect samples. Survey for checking Demand was accompanied in rural, semi-urban and peri-urban areas of Lyallpur and Madina Town. The supply survey was conducted in rural, semi-urban and peri-urban since livestock rearing is restricted in urban regions. Statistical double log regression analysis was deployed to understand key factors influencing new milk demand and supply.

The relationship between dependent and independent variables is given as:

$$Y = f(Xi, Dk) \ldots\ldots\ldots\ldots \ldots\ldots\ldots\ldots (1)$$

where:

Y = Quantity consumed of fresh milk (kg/ month)

Xi = Vector of quantitative variables i = 6

Dk = Vector of qualitative variables k = 1

In a more specific form, equation 1 can be written as:

$$Y = \beta o\ Xi^{\beta i}\ Dj^{\beta k} e^{\mu} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

The equation 2 can be further explained as:

$$Y = \beta o\ X_1^{\beta 1}\ X_2^{\beta 2}\ X_3^{\beta 3}\ X_4^{\beta 4}\ X_5^{\beta 5}\ X_6^{\beta 6}\ D_1^{\beta 7}\ e^{\mu} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

By taking natural log on both sides, equation 3 can be written as:

$$\ln Y = \beta o + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \beta_7 D_1 + \mu \ldots\ldots\ldots (4)$$

where:

Xs are the independent variables in which,

X_1= Number of family members/family size (Persons)

X_2 = Purchase price of milk (Rs. /kg)

X_3= Monthly household income (Rs.)

X_4 = Education of the family head (Years of schooling)

X_5 = Age of the family head (Years)

X_6 = Monthly expenditure on food (Rs.)

D_1 = Dummy variable (ICTs)

D_1=1, if the consumer was employing ICTs

D_1=0, if otherwise

βo is the intercept, βs are the elasticity's and μ is the random error

ln = Natural log.

On the other hand, the relationship between dependent and independent variables is given as:

$$W = f(Zi, Dj) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

where:

W = Quantity of milk produced (Kgs/month)

Zi = Vector of quantitative variables i = 6

Dj = Vector of qualitative variables j = 2

In a more specific form, equation 5 can be written as:

$$W = \beta o\ Zi^{\beta i}\ Dj^{\beta j}\ e^{\mu} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

The equation 6 can be further explained as:

$$W = \beta o\ Z_1^{\beta 1}\ Z_2^{\beta 2}\ Z_3^{\beta 3}\ Z_4^{\beta 4}\ Z_5^{\beta 5} Z_6^{\beta 6}\ D_1^{\beta 7}\ D_2^{\beta 8}\ e^{\mu} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

By taking natural log on both sides, equation 7 can be written as:

$$\ln W = \beta o + \beta_1 \ln Z_1 + \beta_2 \ln Z_2 + \beta_3 \ln Z_3 + \beta_4 \ln Z_4 + \beta_5 \ln Z_5 + + \beta_6 \ln Z_7 + \beta_7 D_1 + \beta_8 D_2 + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

where:
Zs are the independent variables in which,
Z_1= Number of mulch animals (No.)
Z_2 = Farming experience (Years)
Z_3= Value of fodder consumed by farm animals in a month (Rs.)
Z_4= Value of concentrates consumed by farm animals in a month (Rs.)
Z_5 = Monthly expenditures on labour (Rs.)
Z_6 = Sale price of fresh milk (Rs. /kg)
D_1 = Dummy variable (Credit)
D_1=1, if the farmer was availing credit facility
D_1=0, if otherwise
D_2 = Dummy variable (ICTs)
D_2=1, if the farmer was employing ICTs
D_2=0, if otherwise
βo is the intercept, βs are the elasticities, and μ is the random error
ln = Natural log

RESULTS AND DISCUSSIONS

Fresh Milk Demand Function

The dependent variable is fresh milk consumption while the independent variables for this research article includes price paid for fresh milk, the number of family members, income of participant family, education, ICTs, age and monthly food expenses of participants, were evaluated with the help of double log regression analysis.
The descriptive statistics of maximum, mean, minimum, and standard deviation were used to understand the reliant on variables such as milk consumption and independent variables such as several family members, the price paid for fresh milk, participants' family income, education, ICTs, age and monthly nutritional needs of participant families. As per the concept of collinearity or multicollinearity, the relationship between independent variables is more powerful. With the help of sample resistance, the multicollinearity between the independent variables is estimated. The summary of stats and graphical representation is provided in Table 1 and Figure 1, respectively.

Table 1. Summary Statistics of data used for model estimation

Variables	VIF	Tolerance	Minimum	Std. Dev	Mean	Maximum
Income of respondent (Rs. /month)	3.728	0.268	8,000	29,082.44	37,717.2	200,000
Monthly food expenditure (Rs.)	4.041	0.247	3,500	8,320.377	15,470	45,000
Purchase price of milk (Rs. /month)	1.072	0.933	30	4.39	41.73	50
Age of the family head (Years)	1.144	0.874	22	11.82	41.66	67
Education of the family head (Years)	1.116	0.896	5	2.69	13.5	18
Family size (No.)	1.323	0.756	2	1.88	5.46	11
Milk consumption (Kg/month)	0	0	1	1.56	2.94	10

Source: Author's own calculations.

The graphical representation of the stats as mentioned above is presented in Figure 1.
Variable mutually led to a 61% change in the dependent variable, which is milk utilization, while maintaining other variables at a constant state.
This assessment also means that the rest of the 39% variation in the variable resulted from

multiple factors, which cannot be determined based on the current model (Table 2).

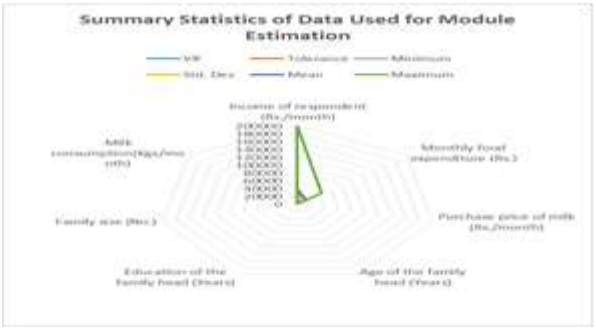

Fig. 1. Summary Statistics of Data used for model
Source: Author's own illustration.

The measurement of F is used to understand if explanatory variables are significant or not to assess the response variable. F measurement in the current study was 14.10 with p less than 0.05, which was significant and thus verified the general fitting of the model in Table 2. A substantial amount of milk interest is controlled by family members. The study found that families with large sizes consumed higher milk.

Table 2. Estimated Demand Function for Fresh Milk

Variables	Significance (P-value)	T-Value	Coefficient
Constant	0.041	2.112	3.29
Family Size (No.)	0.027	2.296	0.268
Purchase price of milk (Rs./Kg)	0.064	-1.899	-0.17
Income of respondent (Rs. /month)	0.102	1.672	0.213
Education of the Family Head (Years of Schooling)	0.908	0.18	0.021
Age of the Family Head (Years)	0.789	0.269	0.036
Employing ICTs by consumer	0.005	0.301	0.245
Monthly Food Expenditure (Rs.)	0.007	2.812	0.104

Source: Author's own calculations

Results in Table 2 show that a 1% expansion in family size would result into a 0.268% rise in milk consumption. It was revealed statistically significant. The price tag of new milk is a conspicuous variable that affects the milk utilization quantity of families.

A decline in milk costs is related to the expansion in dairy items utilization. Evaluated coefficient estimation shows a negative relationship between milk cost and its utilization. A 1 % rise in milk cost would imply a decline of 0.17% in milk utilization. The coefficient of milk cost was high with a 10% value.

The fresh milk quantity consumed is closely related to the family wages. The milk utilization, as well as consumption of dairy items, is closely related to salary levels. Milk spending in month is high in family of higher incomes with a 10% significance level. As per monetary hypothesis, salary is indicative of the obtaining capacity of the family, and hence salary increment is likely to have a positive influence on milk consumption and training lead to better eating habits and nutritional consumption. Milk is an important food products. Education is closely associated to the buying and milk consumption. The coefficients of education, monthly food expenditures and ICTs are positively related to milk utilization, having p-value lower than 1 (Figure 2).

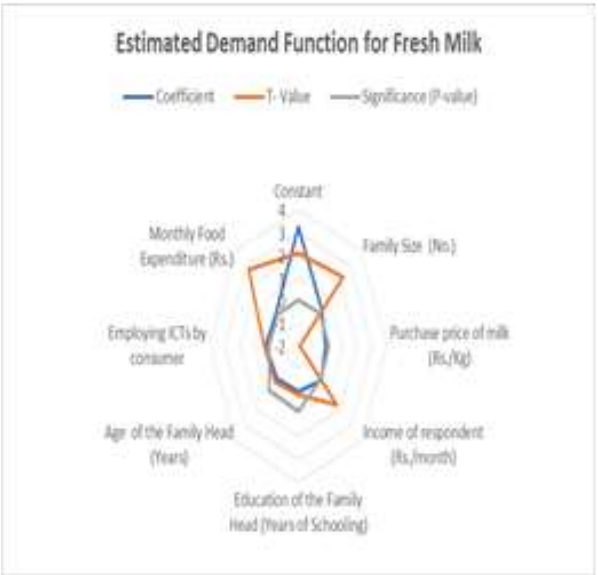

Fig. 2. Estimated demand function of fresh milk
Source: Author's own illustration

Milk is rich in fat and calcium and hence a popular dietary product. Education level, in general, does not have much impact on milk consumption. The age of the household family head has a positive impact on milk consumption but is statistically insignificant. This implies age does not have a major impact on milk utilization. Milk and dairy items form an important dietary component in various parts of the world, and milk is critical for the

growth and maintenance of body. This study shows that a 1% change in family food expenses would lead to a 0.104% change in milk utilization. The regression coefficient for food expenses is a highly significant variable for milk consumption.

Fresh Milk Supply Function

The relation between milk quantity, i.e., the dependent variable and sales price of milk, the value of fodder, concentrates value used in farms, monthly labour expenses, the strength of milking animals, experience of farmers involved in cattle rearing and ICTs, i.e., the independent variables were estimated with the help of double log type regression model. The base was that scattered plot in the middle of n in Table 3.

response and explanatory variables indicated such a relationship.

The statistical summary was utilized to explain the response variable, milk quantity produced, and quantitative explanatory variables such as milk sales price, fodder value consumed, concentrate value, monthly labour expenses, the strength of milking animals, and experience of farmers involved and ICTs. Variance Inflation Factor (VIF) is directly related to resistance. As VIF expands, the regression coefficient changes, thus making it an unsteady factory. Extensive VIF values mean multicollinearity. Estimations are show

Table 3. Summary Statistics of data used for model estimation

Variables	VIF	Tolerance	Std. Deviation	Minimum	Mean	Maximum
Monthly Quantity of milk produced (Kgs)	0	0	2,292.95	240	1,370	11,880
Number of mulching animals (No.)	1.333	0.75	8.386	1	5.57	44
Dairy farming experience (Years)	1.1776	0.85	10.35	1	23.7	45
Value of fodder (Rs.)	3.378	0.296	20,701.04	6,000	17,133.34	120,000
Value of concentrate (Rs.)	1.086	0.921	25,185.17	1,500	12,538.34	140,000
Labour expenditures (Rs. /month)	3.476	0.288	3,643.44	4,000	5,633.34	20,000
Sale price (Rs. /Kg)	1.394	0.717	3.66	30	37.24	47.5

Source: Author's own calculations

The graphical representation of the stats as mentioned above is presented in Figure 3.

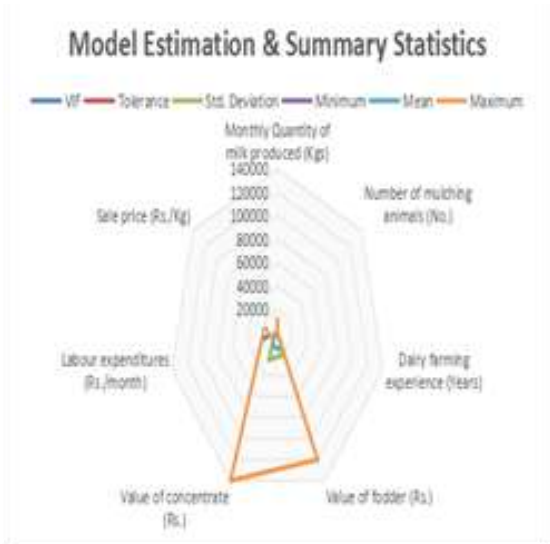

Fig. 3. Model estimation & summary statistics
Source: Author's own illustration

Figure 3 shows the spread of estimated coefficients on a radar graph. Adjacent R^2 in our research was 0.67, which means that every change in the independent variable meant 67% mutual change in the response variable, i.e., the quantity of milk sold while keeping other factors constant.

That explains the remaining 33% change in response variable resulted from multiple variables whose impact cannot be clarified by the current model in Table 4.

F statistic means each independent variable is significant or non-significant for changing response variable.

The F statistic value in the current study was 17.89 with p less than 0.05 and thus accounts for the model's utility (Table 4).

Table 4. Estimated Production Function for Fresh Milk

Variables	Significance (P-value)	T-Value	Coefficient
Constant	0.003	3.335	11.301
Number of mulching animals (No.)	0.079	1.842	0.298
Dairy farming experience (Years)	0.778	0.285	0.028
Value of fodder (Rs.)	0.108	1.677	0.086
Value of concentrate (Rs.)	0	4.331	0.115
Labour expenditures (Rs.)	0.894	-0.135	-0.14
Sale price (Rs. /Kg)	0.02	2.507	0.525
Availing credit facility (dummy variable)	0.561	1.85	0.123
Employing ICTs (dummy variable)	0.004	0.301	0.234

Source: Author's own calculations

Table 4 shows that mulching animals have a direct impact on milk production. Milking animals are a significant factor in milk production. As per estimated regression coefficients, a 1 % rise in milking animals' population will lead to a 0.298% rise in milk production.

The experience of farmers is a critical factor since experienced farmers are likely to be aware of business practices and factors affecting the business. Experience of farmers has a positive impact on dairy business. Results show that a 1 % rise in farmer experience would mean a rise of 0.298% in production of milk. However, statistically insignificance with a p-value less than 0.1 is found in variable. In Pakistan, farmers in majority, follow old-fashioned dairy procedures and own minor farms. In livestock feeding, Fodder is a critical factor in production of milk owing to its usage. Green fodder, as well as dry fodder, are utilized in animal feedstuff. Milk production can increase with the help of balanced feeding to animals. Between fodder consumption and milk production a positive relationship exists. In the current model, a 1 % rise in fodder value means a rise of 0.086% in milk production.

The graphical representation of the stats as mentioned above is presented in Figure 4.

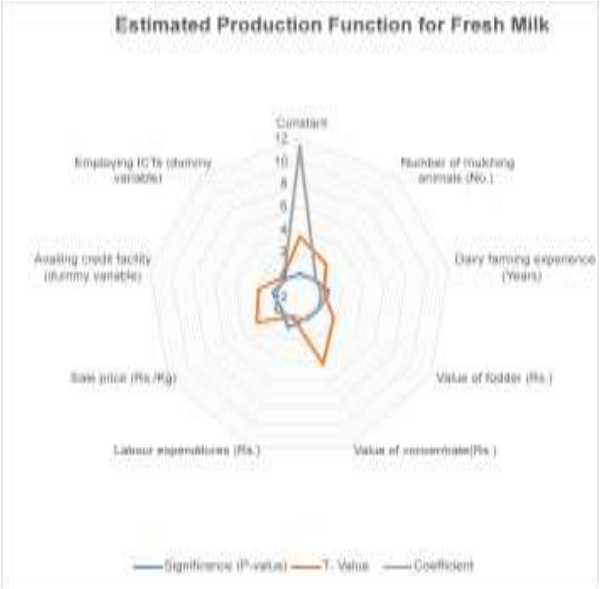

Fig. 4. Estimated production function for fresh milk
Source: Author's own illustration

The concentrate is used for various purposes, such as feeding animals to enhance milk production. It is highly effective in enhancing milk production. A positive relationship has been found between milk production and concentrates value by the estimated model. As per this research, a 1 percent rise in concentrate value is expected to raise milk production by 0.115 percent. Price and input quality have a substantial impact on milk production. Also, fodder and concentrates are considered critical input factors for milk production, and both have a positive impact. This positive relationship indicates that dairy milk production in Pakistan is still below economies of scale. Both fodder and concentrate are statistically significant, thus confirming their criticality for milk production. As per the estimated elasticity coefficient for monthly labor expenses, a 0.014 percent fall in milk production will be the consequence of 1% rise in labor expenses. This variable was statistically insignificant, with a p-value greater than 0.1. Another key factor for milk production is the sales price. Results shown in Table 4 show that a 1 percent rise in price means a rise in milk production by 0.0525 percent. It was established to be a statistically significant value with a p-value greater than 0.05. The sales price has a short-term impact on milk production.

Credit plays a critical part in any business. A dummy variable was included in the model to analyze the possible impact of credit on milk production. It was found that the credit coefficient was positively linked to milk production, but it was insignificant, i.e., the p-value was greater than 0.1. In Pakistan, the majority of the farmers hesitate to take credit due to cumbersome documentation procedures and credit terms set by banks and other financial institutions.

The use of information and communication technologies has been the key to successful expansion. Communication and access to information are directly linked to the development of dairy cooperatives. A dummy variable was included in the model to analyze the possible impact of ICTs on milk production. It was found that the ICT coefficient was positively linked to milk production, and it was significant, i.e., the p-value was lower than 0.1. Dairy cooperatives are one of the most potential areas where ICT can work effectively, primarily for social and economic development, and is directly linked to dairy farms. However, it is still difficult for the rural people of our country to convey important information and communicate in the form they understand. ICT offers the potential to address these issues for different categories of end-users. For this, it is necessary to build information and communication infrastructure in the dairy cooperative.

The results were noticed using various statistical tests such as multicollinearity, F-test, and Variance Inflation Factor (VIF). The scholars found these statistical tests as valid in the context of estimating the level of significance. For instance, [22] observed that with the concept of 'collinearity' or 'multicollinearity,' the relationship between variables could be more powerful. Moreover, [25] observed that measurement of F can be used to understand if explanatory variables are significant or not to assess the response variable. Furthermore, [28; 24] observed that VIF is directly related to the resistance between variables.

Several Scholars were found to be having their views in line with the results of this study. For instance, [42] noticed that family size significantly affects milk consumption. The other in-line views include:

-Worker's training leads to better eating habits and nutritional consumption of animals [33; 27].

-The per capita milk utilization is next to cereal consumption in Pakistan, considering aggregate family unit consumption [3; 9; 7; 21].

-The consumption of domesticated livestock is higher than other items in Pakistan [10; 6; 34].

-One of the most important factors in milk production is concentration [32].

-The concentrate is highly effective in enhancing milk production. Both the production and consumption has been affected by ICTs gradually [10].

-Price and input quality have a substantial impact on milk production [5; 4; 12].

-The sales price is a key motivator for milk producers to enhance milk production [43].

Altogether, Pakistan's livestock industry is dealing with issues of low milk production, poor distribution framework, lower storage quality and competition from international milk producers. Hence, there is a need to reorganize this industry. The government authorities in Pakistan need to work on multiple milk products such as milk augmentation through manual sperm injection, veterinary administration and rearing administration to enhance milk yield. More resources need to be added towards milk advertising and distribution strategy. The dairy sector in Pakistan has been largely ignored, with no critical studies of the sector being conducted.

Based on the knowledge of dairy stakeholders, it was noted that at the farm level, the usage of ICT is low, that puts dairy farmers at their fingertips. He revealed that major dairy countries such as the United States, Europe, New Zealand and Australia use agricultural ICT tools to manage animals from birth to death. The usage of ICT on the farm in relationship of several animals, the genetic make-up of animals, feed, mobility, milk production and milk quality has enabled farmers to manage their farms superior than in

Pakistan. Is. In Pakistan, except for the control of milk fat content and SNF (which is a decisive aspect in determining the value of milk farm gate), the usage of ICT is nowhere to be discovered and becomes an obstacle. The main problems for livestock farms are reducing the number of farmers per farmer (average per farmer 1 or 2 animals) along with lack of information and benefits of ICT in dairy farms. It is difficult for small dairy farmers to get the latest and reliable agricultural information, limiting their maximum agricultural yield. The proper usage of information and communication technologies (ICTs) by smallholders as a tool for agricultural expansion can change the landscape and improve farmers' productivity and incomes through increased prosperity [24].

CONCLUSIONS

Results obtained from the current research show that fresh milk demand is affected by multiple factors such as family size, milk price, monthly income, ICTs and food expenses. On the other hand, the fresh milk supply is affected by the strength of milking animals, fodder value, concentrate value, sales price, and ICTs. The price structure needs to be modified to give advantage to the end consumers by making milk available at a lower price. In the current scenario, consumers are helpless to pay a higher price for inferior quality milk. Additionally, milk producers cannot get high price benefits due to the interference of intermediaries and the absence of financial incentives and schemes. As a result, milk production in rural areas is on a lower side than in urban areas. Here comes the need to reform livestock producer's cooperative societies. Such societies should buy milk from producers and market it to consumers. Other steps such as pushing higher milk production by providing interest-free loans to landless and small farm owners are also needed. Modern dairy farms with indigenous, high-yielding breeds should be raised. We believe that ICTs and digitization will become an effective means of increasing milk production and processing, increasing the competitiveness of dairy products and understanding export potential. ICT depicts an imperative part in the processing and marketing of milk. ICT allows users to save time on ordering and delivery as well as receiving feedback. The management of Dairy Cooperative understands that in the current competitive environment, there is an urgent need to attract new customers and retain existing customers. There is an urgent need to provide ICT services keeping the real state of milk production and marketing [8].

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