**Evaluating Constraints in the Adoption of Improved Dairy Practices**

**among Cooperative and Non-Cooperative Farmers under URMUL in Bikaner district of Rajasthan, India**

 **ABSTRACT**

The paper is based on the premise that dairy farmers under Uttari Rajasthan Cooperative Milk Union Ltd. (URMUL) in Rajasthan face numerous challenges in the adoption of improved dairy practices. Agriculture and animal husbandry have a symbiotic relationship, in which the agricultural sector provides feed and fodder for the livestock, and animals provide milk, manure and draught power for various agricultural operations. The study was conducted to delineate the constraints faced by dairy farmers in the adoption of improved dairy practices. The Uttari Rajasthan Dugdh Utpadak Sahakari Sangh Limited (URMUL), Bikaner, Rajasthan, India, was the locale of the study. URMUL consists of six milk collection units, namely Bikaner, Lunkaransar, Khajuwala, Chattargarh, Bajju and Dungargarh. All six milk collection units were selected for the study. URMUL consists of 49 functional milk collection routes. One milk route was selected randomly from each milk collection unit which have a maximum number of registered functional dairy cooperative societies. This way, six milk collection routes were selected for the proposed study. Three dairy cooperative societies were randomly selected from each route. Thus, a total of 18 dairy cooperative societies were selected. For the selection of the respondents from the selected 18 cooperative societies, a proportionate random sampling procedure was adopted to select the respondents who have received the benefits of dairy cooperative societies under URMUL, and they are called members of URMUL. To constitute the other half of the sample size, the same number of farmers were also selected randomly from the same milk collection units who had not received the benefits of dairy cooperative societies under URMUL, and they were called non-members. Thus, a total of 300 respondents, i.e., 150 members and 150 non-members, were selected from the selected milk collection units as a sample for the present investigation. A semi-structured interview schedule was designed and used to collect data, and then the data was analysed by employing several statistical measures such as mean per cent score, rank correlation, z-test, etc. The results revealed that the major constraints being faced by the dairy farmers in adoption of improved dairy practices were “Irregular and inadequate supply of cattle feed at local level (59.44 MPS)”, “Feed and fodder requirements of cross breed cow is more than desi (57.33 MPS)”, “Discrepant and discrete testing of fat (55.56 MPS )”, “High cost of veterinary medicines (53.89 MPS )” and “Lack of knowledge about the activities and schemes for members of dairy cooperative society (53.78 MPS). It was concluded that the out of the five constraints, viz. “Infrastructural constraints” was ranked first in terms of the adoption of improved dairy practices among Cooperative and Non-Cooperative Farmers.

**Keywords:** Constraints, Cooperative Dairy Members, Improved Dairy Practices, Adoption

**INTRODUCTION**

The animal husbandry industry stands as a pillar of the agricultural sector (Su & Li,2025). Agriculture and animal husbandry have a symbiotic relationship, in which the agricultural sector provides feed and fodder for the livestock, and animals provide milk, manure and draught power for various agricultural operations. About 42.3 per cent of the Indian population depends on agriculture for their livelihood (Anonymous 2023-24b). The dairy sector is instrumental in bringing socioeconomic transformation in India. Dairying has become a significant secondary source of income for millions of rural families. It has assumed the most important role in providing employment and also income-generating opportunities, especially for women and marginal farmers and also provides improved nutritional benefits. A dairy cooperative business is owned, operated, and controlled by the dairy farmers who benefit from its services. The major stakeholders of the dairy industry are milk producers, milk processors, marketers, retailers and consumers. Milk producers, the value chain and consumers are equally essential in the development of the dairy sector (Sarkar & Dutta,2020; Esho,2022). Members finance the cooperative and share in the profits it earns in proportion to the volume of milk they market through the cooperative. This paper is based on the premise that dairy farmers under URMUL in Rajasthan face numerous challenges in the adoption of improved dairy practices. The study aims to explore these constraints and gain a deeper understanding of the issues faced by dairy farmers in this region.

**MATERIAL AND METHODS**

URMUL consists of six milk collection units, namely Bikaner, Lunkaransar, Khajuwala, Chattargarh, Bajju and Dungargarh. All six milk collection units were selected for the purpose of the study. URMUL consists of 49 functional milk collection routes. One milk route was selected randomly from each milk collection unit which have a maximum number of registered functional dairy cooperative societies. This way, six milk collection routes were selected for the proposed study. URMUL consists of 312 functional Dairy Cooperative Societies (DCSs) out of a total of 950 registered dairy cooperative societies. Three dairy cooperative societies were randomly selected from each route. Thus, a total of 18 dairy cooperative societies were selected. For the selection of the respondents from the selected 18 cooperative societies, a proportionate random sampling procedure was adopted to select the respondents who have received the benefits of dairy cooperative societies under URMUL, and they are called members of URMUL. To constitute the other half of the sample size, the same number of farmers were also selected randomly from the same milk collection units who had not received the benefits of dairy cooperative societies under URMUL and they called non-members. Thus, a total of 300 respondents, i.e., 150 members and 150 non-members were selected from the selected milk collection units as a sample for the present investigation. Subsequently, a semi-structured interview schedule was designed and used to collect data, and then the data was analysed by employing several statistical measures such as mean per cent score, rank correlation, z-test, etc.

**RESULTS AND DISCUSSION**

Constraints are limitations or barriers that restrict the achievement of objectives. They can involve resources, time or external factors that hinder progress. In various fields, such as dairying or agriculture, constraints define the challenges that need to be overcome for success. To assess the constraints hindering the adoption of improved dairy practices by respondents, a schedule was developed. This section aimed to identify the challenges faced by respondents in adopting improved dairy practices. For the present study, all the possible constraints faced by the dairy farmers were grouped into five major categories, *viz*. infrastructural constraints, technical constraints, socio-psychological constraints, economic constraints and marketing constraints. In order to study various types of constraints, the dairy farmers were asked to give theirresponses on the three-point continuum. Based on the scores in each constraint category, the Mean Per cent Score (MPS) was calculated. The constraints were then ranked accordingly, and rank correlation was determined for each dimension.

**Infrastructural constraints**

The data in Table 1 shows that the most perceived infrastructural constraints as “Irregular and inadequate supply of cattle feed at local level” (43.56 MPS) were major constraints faced by the members and non-members (75.33 MPS) of dairy cooperative societies in the adoption of improved dairy practices. In case of members of dairy cooperative societies “Lack of improved dairy equipment” (42.67 MPS), “Un-availability of emergency veterinary services for dairy animals” (39.78 MPS), “Un-availability of green fodder round the year” (39.56 MPS), “Un-availability of vaccines at local level in time” (37.11 MPS), “Lack of marketing infrastructural facility”( 35.78 MPS), “Unavailability of animal insurance facility” (35.33 MPS), “Occasional availability of semen at the centre for A.I.” (34.22 MPS), “Un-availability of cattle feed and fodder seed on credit basis” (34.00 MPS), “Lack of training facilities for dairy members” (31.78 MPS), “Un-availability of desired variety of fodder seeds timely” (31.33 MPS) and “Distant location of dairy co-operative societies from home” (28.44 MPS) aspects were assigned ranks second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh and twelfth, respectively by the members of dairy cooperative societies in infrastructural constraints.

In case of non-members of dairy cooperative societies they faced “Un-availability of emergency veterinary services for dairy animals” (72.22 MPS), “Un-availability of green fodder round the year” (71.33 MPS), “Lack of improved dairy equipment” (69.11 MPS), “Un-availability of vaccines at local level in time” (68.00 MPS), “Lack of training facilities for dairy members” (66.44 MPS), “Occasional availability of semen at the centre for A.I.” (64.22 MPS), “Lack of marketing infrastructural facility” (62.89 MPS), “Unavailability of animal insurance facility” (59.56 MPS), “Un-availability of cattle feed and fodder seed on credit basis” (58.22

##### **Table 1 Infrastructural constraints perceived by the members and non-members of dairy cooperative societies in adoption of improved dairy practices, N=300**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.****No.** | **Aspects** | **Members of DCSs****(n=150)** | **Non-members of DCSs****(n=150)** | **Overall****(N=300)** |
| **MPS** | **Rank** | **MPS** | **Rank** | **MPS** |  **Rank** |
| 1. | Lack of improved dairy equipment | 42.67 | II | 69.11 | IV | 57.67 | II |
| 2. | Un-availability of vaccines at local level in time  | 37.11 | V | 68.00 | V | 52.56 | V |
| 3. | Un-availability of emergency veterinary services for dairy animals  | 39.78 | III | 72.22 | II | 54.44 | III |
| 4. | Occasional availability of semen at the centre for A.I. | 34.22 | VIII | 64.22 | VII | 47.67 | VIII |
| 5. | Irregular and inadequate supply of cattle feed at local level | 43.56 | I | 75.33 | I | 59.44 | I |
| 6. | Un-availability of green fodder round the year | 39.56 | IV | 71.33 | III | 54.22 | IV |
| 7. | Un-availability of desired variety of fodder seeds timely | 31.33 | XI | 56.67 | XI | 43.67 | XI |
| 8. | Un-availability of cattle feed and fodder seed on credit basis | 34.00 | IX | 58.22 | X | 46.11 | X |
| 9. | Unavailability of animal insurance facility | 35.33 | VII | 59.56 | IX | 49.44 | VII |
| 10. | Distant location of dairy co-operative societies from home | 28.44 | XII | 53.56 | XII | 40.33 | XII |
| 11. | Lack of training facilities for dairy members | 31.78 | X | 66.44 | VI | 47.44 | IX |
| 12. | Lack of marketing infrastructural facility | 35.78 | VI | 62.89 | VIII | 50.44 | VI |
| **Total** | **36.13** |  | **64.80** |  | **50.29** |  |

rs=Rank correlation, \*\*= Significant at 0.01 level of probability

 rs= 0.89

 t= 6.17\*\*

MPS), “Un-availability of desired variety of fodder seeds timely” (56.67 MPS) and “Distant location of dairy co-operative societies from home” (53.56 MPS) aspects were assigned ranks second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh and twelfth, respectively.

Further, the data in Table 1 also illustrates that in infrastructural constraints majority of the overall respondents reported “Irregular and inadequate supply of cattle feed at local level” with 59.44 MPS and ranked first as the most perceived constraints. The second highest rank was assigned to “Lack of improved dairy equipment” with 57.67 MPS, subsequently “Un-availability of emergency veterinary services for dairy animals” (54.44 MPS), “Un-availability of green fodder round the year” (54.22 MPS), “Un-availability of vaccines at local level in time” (52.56 MPS), “Lack of marketing infrastructural facility” (50.44 MPS), “Unavailability of animal insurance facility” (49.44 MPS), “Occasional availability of semen at the centre for A.I.” (47.67 MPS), “Lack of training facilities for dairy members” (47.44 MPS), “Un-availability of cattle feed and fodder seed on credit basis” (46.11 MPS) and “Un-availability of desired variety of fodder seeds timely” (43.67 MPS) aspects were assigned rank third, fourth, fifth, sixth, seventh, eighth, ninth, tenth and eleventh, respectively. While “Distant location of dairy co-operative societies from home” (40.33 MPS) is perceived as the last rank in infrastructural constraints.

The value of the rank correlation (rs) between members and non-members of dairy cooperative societies was 0.89. The calculated value of 't' (6.17) was higher than its tabulated value. This shows positive and significant rank correlation at a one per cent level of significance, which leads to the conclusion that there was a similarity in rank assignment pattern in infrastructural constraints among members and non-members of dairy cooperative societies about improved dairy practices. The possible reasons and facts that a lack of infrastructure due to inadequate roads and transportation networks make it difficult for farmers to access markets, veterinary services, input supplies, veterinary clinics and diagnostic facilities. Presented findings are supported by the results of studies conducted by Singh et al. (2017), Meena et al. (2018) and Sharma et al. (2020).

**Technical constraints**

The data in Table 2 indicates that the most perceived technical constraints as “Intolerance of exotic breed to high temperature” (44.00 MPS) were major constraints faced by the members of dairy cooperative societies in the adoption of improved dairy practices. In case of members of dairy cooperative societies “Feed and fodder requirements of cross breed cow is more than desi” (42.00 MPS), “Cross breed cow milk has poor fat percentage” (41.33 MPS), “Susceptibility of exotic breed to diseases” (36.89 MPS), “Poor conception rate of A.I. in cow and buffalo” (34.67 MPS), “Lack of technical guidance related to diary practices” ( 33.11 MPS), “Unavailability of semen at A.I. centre” (28.00 MPS), “Un-availability of high genetic merit bull for natural breeding” (26.22 MPS), “Lack of knowledge about cheap and scientific housing of animals” (25.56 MPS) and “Lack of technical know how about feeding and health care practices” (24.67 MPS) aspects were assigned ranks second, third, fourth, fifth, sixth, seventh, eighth, ninth and tenth respectively by the members of dairy cooperative societies in technical constraints.

In case of non-members of dairy cooperative societies they faced “Feed and fodder requirements of cross breed cow is more than desi” (72.67 MPS) ranked first as most descry technical constraint faced by the non-members followed by “Cross breed cow milk has poor fat percentage” (71.78 MPS), “Intolerance of exotic breed to high temperature” (68.67 MPS), “Susceptibility of exotic breed to diseases” (67.56 MPS), “Poor conception rate of A.I. in cow and buffalo” (48.89MPS), “Lack of knowledge about cheap and scientific housing of animals” (48.67 MPS), “Lack of technical know how about feeding and health care practices” (47.11 MPS), “Un-availability of high genetic merit bull for natural breeding” (43.56 MPS), “Unavailability of semen at A.I. centre” (36.67 MPS) and “Lack of technical guidance related to diary practices” (33.33 MPS) aspects were assigned ranks second, third, fourth, fifth, sixth, seventh, eighth, ninth and tenth, respectively.

Further, Table 2 also depicts that in technical constraints majority of the overall respondents reported “Feed and fodder requirements of cross-breed cow is more than desi” with 57.33 MPS and ranked first as the most perceived constraints. The second highest rank was assigned to “Cross breed cow milk has poor fat percentage” with 56.56 MPS, subsequently “Intolerance of exotic breed to high temperature” (56.33 MPS), “Susceptibility of exotic breed to diseases” (52.22 MPS), “Poor conception rate of A.I. in cow and buffalo” (41.78 MPS), “Lack of knowledge about cheap and scientific housing of animals” (37.11 MPS), “Lack of technical know how about feeding and health care practices” (35.89 MPS), “Un-availability of high genetic merit bull for natural breeding” (34.89 MPS), “Lack of technical guidance related to diary practices” (33.22 MPS) and “Unavailability of semen at A.I. centre” (32.33 MPS) aspects were assigned rank third, fourth, fifth, sixth, seventh, eighth, ninth and tenth, respectively.

##### **Table 2 Technical constraints perceived by the members and non-members of dairy cooperative societies in adoption of improved dairy practices N=300**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.****No.** | **Aspects** | **Members of DCSs****(n=150)** | **Non-members of DCSs****(n=150)** | **Overall****(N=300)** |
| **MPS** | **Rank** | **MPS** | **Rank** | **MPS** | **Rank** |
| 1. | Lack of technical guidance related to diary practices | 33.11 | VI | 33.33 | X | 33.22 | IX |
| 2. | Un-availability of high genetic merit bull for natural breeding | 26.22 | VIII | 43.56 | VIII | 34.89 | VIII |
| 3. | Susceptibility of exotic breed to diseases | 36.89 | IV | 67.56 | IV | 52.22 | IV |
| 4. | Intolerance of exotic breed to high temperature | 44.00 | I | 68.67 | III | 56.33 | III |
| 5. | Cross breed cow milk has poor fat percentage | 41.33 | III | 71.78 | II | 56.56 | II |
| 6. | Feed and fodder requirements of cross breed cow is more than desi | 42.00 | II | 72.67 | I | 57.33 | I |
| 7. | Lack of technical know how about feeding and health care practices | 24.67 | X | 47.11 | VII | 35.89 | VII |
| 8. | Poor conception rate of A.I. in cow and buffalo | 34.67 | V | 48.89 | V | 41.78 | V |
| 9. | Unavailability of semen at A.I. centre | 28.00 | VII | 36.67 | IX | 32.33 | X |
| 10. | Lack of knowledge about cheap and scientific housing of animals | 25.56 | IX | 48.67 | VI | 37.11 | VI |
| **Total** | **33.64** |  | **53.89** |  | **43.77** |  |

rs=Rank correlation, \*\*= Significant at 0.01 level of probability

 rs= 0.73

 t= 3.02\*\*

The value of the rank correlation (rs) between members and non-members of dairy cooperative societies was 0.73. The calculated value of 't' (3.02) was higher than its tabulated value. This shows positive and significant rank correlation at a one per cent level of significance, which leads to the conclusion that there was a similarity in rank assignment pattern in technical constraints among members and non-members of dairy cooperative societies about improved dairy practices. The possible reasons and facts include that lack of knowledge, inadequate access to technology, systemic challenges, and a lack of diagnostic tools and laboratories delay disease identification and treatment. Presented findings are supported by the results of studies conducted by Singh et al. (2017), Meena et al. (2018) and Sharma et al. (2020).

**Socio-psychological constraints**

The data in Table 3 reveals that the most perceived socio-psychological constraints as “Lack of knowledge about the activities and schemes for members of dairy cooperative society” (43.56 MPS) were major constraints faced by the members of dairy cooperative societies in the adoption of improved dairy practices. In case of members of dairy cooperative societies “The co-operative society is meant for influential people” (38.67 MPS), “Faction among members due to caste and family consciousness” (36.44 MPS), “Lack of co-operation and co-ordination among members of society” ( 34.44 MPS), “Milk of cross breed cow has poor acceptability by family members” (33.56 MPS), “Lack of resources for providing scientific housing” (32.44 MPS), “Real control of dairy co-operative society in hands of secretary” (30.44 MPS) and “Irregular meeting of society” (28.22 MPS) aspects were assigned ranks second, third, fourth, fifth, sixth, seventh and eighth respectively by the members of dairy cooperative societies in socio-psychological constraints.

In case of non-members of dairy cooperative societies they faced “Milk of cross breed cow has poor acceptability by family members” (65.33 MPS) ranked first as most descry socio-psychological constraints faced by the non-members followed by “Faction among members due to caste and family consciousness” (64.89 MPS), “Lack of knowledge about the activities and schemes for members of dairy cooperative society” (64.00 MPS), “The co-operative society is meant for influential people” (56.00 MPS), “Lack of co-operation and co-ordination among members of society” (55.56 MPS), “Lack of resources for providing scientific housing” (49.11 MPS), “Real control of dairy co-operative society in hands of secretary” (48.44 MPS) and “Irregular meeting of society” (45.78 MPS) aspects were assigned ranks second, third, fourth, fifth, sixth, seventh and eighth respectively.

Data in Table 3 further indicates that in socio-psychological constraints majority of the overall respondents reported “Lack of knowledge about the activities and schemes for members of dairy cooperative society” with 53.78 MPS and ranked first as the most perceived constraints. The second highest rank was assigned to “Faction among members due to caste and family consciousness” with 50.67 MPS, subsequently “Milk of cross breed cow has poor acceptability by family members” (49.44 MPS), “The co-operative society is meant for influential people” (47.33 MPS), “Lack of co-operation and co-ordination among members of society” (45.00 MPS), “Lack of resources for providing scientific housing” (40.78 MPS), “Real control of dairy co-operative society in hands of secretary” (39.44 MPS) and “Irregular meeting of society” (37.00 MPS) aspects were assigned rank third, fourth, fifth, sixth, seventh and eighth respectively.

##### **Table 3 Socio-psychological constraints perceived by the members and non-members of dairy cooperative societies in adoption of improved dairy practices N=300**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.** **No.** | **Aspects** | **Members of DCSs****(n=150)** | **Non-members of DCSs****(n=150)** | **Overall****(N=300)** |
| **MPS** | **Rank** | **MPS** | **Rank** |  **MPS** | **Rank** |
| 1. | The co-operative society is meant for influential people | 38.67 | II | 56.00 | IV | 47.33 | IV |
| 2. | Lack of knowledge about the activities and schemes for members of dairy cooperative society | 43.56 | I | 64.00 | III | 53.78 | I |
| 3. | Lack of resources for providing scientific housing | 32.44 | VI | 49.11 | VI | 40.78 | VI |
| 4. | Faction among members due to caste and family consciousness | 36.44 | III | 64.89 | II | 50.67 | II |
| 5. | Lack of co-operation and co-ordination among members of society | 34.44 | IV | 55.56 | V | 45.00 | V |
| 6. | Milk of cross breed cow has poor acceptability by family members | 33.56 | V | 65.33 | I | 49.44 | III |
| 7. | Real control of dairy co-operative society in hands of secretary | 30.44 | VII | 48.44 | VII | 39.44 | VII |
| 8. | Irregular meeting of society | 28.22 | VIII | 45.78 | VIII | 37.00 | VIII |
| **Total** | **34.72** |  | **56.14** |  | **45.43** |  |

 rs=Rank correlation, \*= Significant at 0.05 level of probability

 rs= 0.69

 t= 2.33\*

The value of the rank correlation (rs) between members and non-members of dairy cooperative societies was 0.69. The calculated value of 't' (2.33) was higher than its tabulated value. This shows positive and significant rank correlation at a five per cent level of significance, which leads to the conclusion that there was a similarity in rank assignment pattern in socio-psychological constraints among members and non-members of dairy cooperative societies about improved dairy practices. The possible reasons and facts that are concerned about failing to implement practices correctly or achieving the desired results can discourage experimentation, and farmers with low educational levels or limited exposure may feel incapable of understanding or applying advanced techniques. Presented findings are supported by the results of studies conducted by Singh et al. (2017) and Sharma et al. (2020).

**Economic constraints**

The data in Table 4 illustrates that the most perceived economic constraint as “High cost of cross-breed cow” (44.00 MPS) was a major constraint faced by the members of dairy cooperative societies in the adoption of improved dairy practices. In case of members of dairy cooperative societies “High charges of emergency veterinary services” (42.00 MPS), “High cost of veterinary medicines” (41.33 MPS), “Low price of milk offered by union” (36.89 MPS), “High cost of cattle feed and mineral mixture” (34.67 MPS), “Lack of capital” ( 33.56 MPS), “Lack of knowledge of keeping data wise financial record” (32.67 MPS), “Delay in payment of milk” (30.44 MPS), “No incentives for supplying milk to society and higher milk producers” (28.67 MPS) and “High charges for cattle insurance” (26.00 MPS) aspects were assigned ranks second, third, fourth, fifth, sixth, seventh, eighth, ninth and tenth respectively by the members of dairy cooperative societies in economic constraints.

In case of non-members of dairy cooperative societies they faced “High cost of cattle feed and mineral mixture” (70.67 MPS) ranked first as most descry economic constraints faced by the non-members followed by “High cost of veterinary medicines” (66.44 MPS), “High charges of emergency veterinary services” (65.56 MPS), “High cost of cross breed cow” (59.11 MPS), “Delay in payment of milk” (56.22 MPS), “Low price of milk offered by union” (54.67 MPS), “No incentives for supplying milk to society and higher milk producers” (49.78 MPS), “High charges for cattle insurance” (47.78 MPS), “Lack of capital” (33.78 MPS) and “Lack of knowledge of keeping data wise financial record” (33.33 MPS) aspects were assigned ranks second, third, fourth, fifth, sixth, seventh, eighth, ninth and tenth, respectively.

Data in Table 4 further indicates that, in economic constraints majority of the overall respondents reported “High cost of veterinary medicines” with 53.89 MPS and ranked first as the most perceived constraints. The second highest rank was assigned to “High charges of emergency veterinary services” with 53.78 MPS, subsequently “High cost of cattle feed and mineral mixture” (52.67 MPS), “High cost of cross breed cow” (51.56 MPS), “Low price of milk offered by union” (45.78 MPS), “Delay in payment of milk” (43.33 MPS), “No incentives for supplying milk to society and higher milk producers” (39.22 MPS), “High charges for cattle insurance” (36.89 MPS), “Lack of capital” (33.67 MPS) and “Lack of knowledge of keeping data wise financial record” (33.00 MPS) aspects were assigned rank third, fourth, fifth, sixth, seventh, eighth, ninth and tenth, respectively.

##### **Table 4 Economic constraints perceived by the members and non-members of dairy cooperative societies in the adoption of improved dairy practices N=300**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. No.** | **Aspects** | **Members of DCSs****(n=150)** | **Non-members of DCSs****(n=150)** | **Overall****(N=300)** |
| **MPS** | **Rank** | **MPS** | **Rank** | **MPS** | **Rank** |
| 1. | Lack of capital | 33.56 | VI | 33.78 | IX | 33.67 | IX |
| 2. | Delay in payment of milk | 30.44 | VIII | 56.22 | V | 43.33 | VI |
| 3. | Low price of milk offered by union | 36.89 | IV | 54.67 | VI | 45.78 | V |
| 4. | High cost of cross breed cow | 44.00 | I | 59.11 | IV | 51.56 | IV |
| 5. | High cost of veterinary medicines | 41.33 | III | 66.44 | II | 53.89 | I |
| 6. | High charges of emergency veterinary services | 42.00 | II | 65.56 | III | 53.78 | II |
| 7. | High charges for cattle insurance | 26.00 | X | 47.78 | VIII | 36.89 | VIII |
| 8. | High cost of cattle feed and mineral mixture | 34.67 | V | 70.67 | I | 52.67 | III |
| 9. | Lack of knowledge of keeping data wise financial record | 32.67 | VII | 33.33 | X | 33.00 | X |
| 10. | No incentives for supplying milk to society and higher milk producers | 28.67 | IX | 49.78 | VII | 39.22 | VII |
| **Total** | **35.02** |  | **53.73** |  | **44.38** |  |

 rs=Rank correlation, \*= Significant at 0.05 level of probability

 rs= 0.60

 t= 2.12\*

The value of the rank correlation (rs) between members and non-members of dairy cooperative societies was 0.60. The calculated value of 't' (2.12) was higher than its tabulated value. This shows positive and significant rank correlation at a five per cent level of significance, which leads to the conclusion that there was a similarity in rank assignment pattern in economic constraints among members and non-members of dairy cooperative societies about improved dairy practices. The possible reasons and facts that the dairy farmers adopt improved dairy practices, particularly in the context of dairy cooperative societies, had limited financial resources, high costs, and systemic challenges that make it difficult for farmers to invest in and sustain advanced practices. Fluctuating milk prices reduce farmers' confidence in making long-term investments. Presented findings are supported by the results of studies conducted by Singh et al. (2017), Meena et al. (2018) and Sharma et al. (2020).

**M****arketing constraints**

The data in Table 5 depicts that the most perceived marketing constraints as “Discrepant and discrete testing of fat” (41.56 MPS) were major constraints faced by the members and non-members (69.56 MPS) of dairy cooperative societies in the adoption of improved dairy practices. In case of members of dairy cooperative societies “Irregular payment made by milk vendor” (39.56 MPS), “No provision for advance payment of milk” (37.11 MPS), “Difficulty in marketing of value-added products” (35.78 MPS), “Lack of regulated market and milk cooperatives” (34.67 MPS), “Lack of transport facilities and all-weather road”(33.33 MPS), “Unavailability of sufficient quantity of milk for selling” (32.67 MPS), “Low price of milk offered by milk vendors” (30.22 MPS), “Door step purchasing system of milk is not available at society” (28.44 MPS), “Irresponsible and irregular transporter” (26.89 MPS), “Lack of marketing information” (25.78 MPS) and “Distantly located collection centre” (23.56 MPS) aspects were assigned ranks second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh and twelfth, respectively by the members of dairy cooperative societies in marketing constraints.

In case of non-members of dairy cooperative societies they faced “Irregular payment made by milk vendor” (68.22 MPS), “Lack of marketing information” (64.89 MPS), “Difficulty in marketing of value-added products” (57.11 MPS), “Lack of regulated market and milk cooperatives” (55.11 MPS), “Lack of transport facilities and all-weather road” (54.22 MPS), “Low price of milk offered by milk vendors” (52.00 MPS), “Unavailability of sufficient quantity of milk for selling” (51.56 MPS), “Door step purchasing system of milk is not available at society” (50.89 MPS), “No provision for advance payment of milk” (50.44 MPS), “Irresponsible and irregular transporter” (47.56 MPS) and “Distantly located collection centre” (45.56 MPS) aspects were assigned ranks second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh and twelfth, respectively.

##### **Table 5 Marketing constraints perceived by the members and non-members of dairy cooperative societies in adoption of improved dairy practices N=300**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.** **No.** | **Aspects** | **Members of DCSs****(n=150)** | **Non-members of DCSs****(n=150)** | **Overall****(N=300)** |
| **MPS** | **Rank** | **MPS** | **Rank** |  **MPS** | **Rank** |
| 1. | Lack of marketing information | 25.78 | XI | 64.89 | III | 45.33 | IV |
| 2. | Irresponsible and irregular transporter | 26.89 | X | 47.56 | XI | 37.22 | XI |
| 3. | No provision for advance payment of milk | 37.11 | III | 50.44 | X | 43.78 | VII |
| 4. | Irregular payment made by milk vendor | 39.56 | II | 68.22 | II | 53.89 | II |
| 5. | Low price of milk offered by milk vendors | 30.22 | VIII | 52.00 | VII | 41.11 | IX |
| 6. | Unavailability of sufficient quantity of milk for selling | 32.67 | VII | 51.56 | VIII | 42.11 | VIII |
| 7. | Discrepant and discrete testing of fat | 41.56 | I | 69.56 | I | 55.56 | I |
| 8. | Distantly located collection centre | 23.56 | XII | 45.56 | XII | 34.56 | XII |
| 9. | Lack of regulated market and milk cooperatives | 34.67 | V | 55.11 | V | 44.89 | V |
| 10. | Lack of transport facilities and all-weather road | 33.33 | VI | 54.67 | VI | 44.00 | VI |
| 11. | Difficulty in marketing of value-added products | 35.78 | IV | 57.11 | IV | 46.44 | III |
| 12. | Door step purchasing system of milk is not available at society | 28.44 | IX | 50.89 | IX | 39.67 | X |
| **Total** | **32.46** |  | **55.59** |  | **44.03** |  |

 rs=Rank correlation, \*= Significant at 0.05 level of probability

 rs= 0.59

 t= 2.31\*

Data in Table 5 further indicates that in marketing constraints majority of the overall respondents reported “Discrepant and discrete testing of fat” with 55.56 MPS and ranked first as the most perceived constraints. The second highest rank was assigned to “Irregular payment made by milk vendor” with 53.89 MPS, subsequently “Difficulty in marketing of value-added products” (46.44 MPS), “Lack of marketing information” (45.33 MPS), “Lack of regulated market and milk cooperatives” (44.89 MPS), “Lack of transport facilities and all-weather road” (44.00 MPS), “No provision for advance payment of milk” (43.78 MPS), “Unavailability of sufficient quantity of milk for selling” (42.11 MPS), “Low price of milk offered by milk vendors” (41.11 MPS), “Door step purchasing system of milk is not available at society” (39.67 MPS) and “Irresponsible and irregular transporter” (37.22 MPS) aspects were assigned rank third, fourth, fifth, sixth, seventh, eighth, ninth, tenth and eleventh, respectively. While “Distantly located collection centre” (34.56 MPS) is perceived as the last rank in marketing constraints.

The value of the rank correlation (rs) between members and non-members of dairy cooperative societies was 0.59. The calculated value of 't' (2.31) was higher than its tabulated value. This shows positive and significant rank correlation at a five per cent level of significance, which leads to the conclusion that there was a similarity in rank assignment pattern in marketing constraints among members and non-members of dairy cooperative societies about improved dairy practices. The possible reasons and facts that due to systemic inefficiencies, lack of market access, and low bargaining power. Dairy cooperatives may have limited reach, restricting farmers’ access to diverse or lucrative markets. Farmers often depend on intermediaries, who take a significant share of the profits. Presented findings are supported by the results of studies conducted by Sharma et al. (2020).

**Overall constraints as perceived by the members and non-members of dairy cooperative societies in the adoption of improved dairy practices**

The data in Table 6 reveals that the overall constraints faced by the dairy farmers, “Infrastructural constraints”, with 50.46 MPS, ranked first as the most perceived constraints in the rank hierarchy. It might be due to inadequate roads and transportation networks make it difficult for farmers to access markets, veterinary services, or input supplies like quality feed and fodder, and a lack of accessible veterinary clinics and diagnostic facilities hampers disease prevention and treatment efforts.

It was observed that “Socio-psychological constraints” with 45.43 MPS ranked second; it might be due to these constraints arise from cultural, social, and psychological factors that influence attitudes, perceptions, and behaviour. The next significant constraint perceived by the dairy farmers was “Economic constraints”, with 44.38 MPS securing their place as third rank, it might be due to limited financial resources, high costs, and systemic challenges that make it difficult for farmers to invest in and sustain advanced practices. According to Table 6, “Marketing constraints” with 44.03 MPS and “Technical constraints” with 43.77 MPS secured their place as fourth and fifth rank, respectively. These major constraints might due to systemic inefficiencies, lack of market access, and low bargaining power.

##### **Table 6:** **Overall constraints as perceived by the members and non-members of dairy cooperative societies in the adoption of improved dairy practices**

**N=300**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  **S.**  **No.** | **Constraints** | **Members of DCSs****(n=150)** | **Non-members of DCSs****(n=150)** | **Overall****(N=300)** |
| **MPS** | **Rank** | **MPS** | **Rank** | **MPS** | **Rank** |
| 1. | Infrastructural constraints | 36.13 | I | 64.80 | I | 50.46 | I |
| 2. | Technical constraints | 33.64 | IV | 53.89 | IV | 43.77 | V |
| 3. | Socio-psychological constraints | 34.72 | III | 56.14 | II | 45.43 | II |
| 4. | Economic constraints | 35.02 | II | 53.73 | V | 44.38 | III |
| 5. | Marketing constraints | 32.46 | V | 55.59 | III | 44.03 | IV |
| **Total** | **34.40** |  | **56.83** |  | **45.61** |  |

rs=Rank correlation, NS= non-significant

 rs= 0.30

 t= 0.54NS

The data in Table 6 reveals that in case of members of dairy cooperative societies “Infrastructural constraints” with 36.13 MPS ranked first as most perceived constraints in rank hierarchy followed by “Economic constraints”, “Socio-psychological constraints”, “Technical constraints” and “Marketing constraints”, with 35.02, 34.72, 33.64 and 32.46 MPS were considered as important constraints by the members and ranked as second, third, fourth and fifth, respectively. In case of non-members of dairy cooperative societies “Infrastructural constraints” with 64.80 MPS ranked first as most perceived constraints in rank hierarchy followed by “Socio-psychological constraints”, “Marketing constraints”, “Technical constraints” and “Economic constraints” with 56.14, 55.59, 53.89 and 53.73 MPS were also considered as important constraints by the non-members and ranked as second, third, fourth and fifth, respectively.

Rank correlation is a statistical measure that evaluates the strength and direction of the relationship between two ranked variables. The value of the rank correlation between members and non-members of dairy cooperative societies (rs) was 0.30. The calculated value of “t‟ (0.54) was lower than its tabulated value. This directed to the conclusion that there was no similarity between the assignment of ranks by members and non-members of dairy cooperative societies in different aspects of overall constraints in the adoption of improved dairy practices.

**CONCLUSION**

From the above findings, it is concluded that out of the five constraints, viz. “Infrastructural constraints” (50.46 MPS) was ranked first, followed by “Socio-psychological constraints” (45.43 MPS) which was ranked second, “Economic constraints” (44.38 MPS) ranked third, “Marketing constraints” (44.03 MPS) ranked fourth and “Technical constraints” (43.77 MPS) ranked fifth, respectively by the dairy farmers. The major aspects of constraints faced by dairy farmers were “Irregular and inadequate supply of cattle feed at local level” in infrastructural constraints, “Lack of knowledge about the activities and schemes for members of dairy cooperative society” in socio-psychological constraints, “High cost of veterinary medicines” in economic constraints, “Discrepant and discrete testing of fat” in marketing constraints and “Feed and fodder requirements of cross breed cow is more than desi” in technical constraints.

**COMPETING INTERESTS DISCLAIMER:**

Authors have declared that they have no known competing financial interests OR non-financial interests, OR personal relationships that could have appeared to influence the work reported in this paper.

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