

## Comparative Analysis of Adoption of Improved Dairy-animal Feeding Practices in Assured and Less Irrigated Areas of Uttar Pradesh

Rupendra Kumar<sup>1</sup> and Jogender Singh<sup>2</sup>

### ABSTRACT

Dairying in India has made significant progress and produces of 88 million tonnes of milk. To boost milk production, animal nutritional research interventions to harness the existing genetic production potential optimally of our livestock is essential. Crop residues, roughages, non-conventional feeds and agricultural and agro industrial by-products will continue to be the major inputs as livestock feed for the ruminants. Unfortunately, the existing technologies for improving digestibility of straws have not been used by the farmers. The need is to use biotechnological techniques to develop the recombinant microbes to digest straws and make available energy for livestock feeding. The study was conducted in Aligarh district of Uttar Pradesh with 300 farmers. Majority (52.0 and 81.33%) of the farmers in assured irrigated and less irrigated area adopted the improved feeding practices to a medium level, respectively.

**Key words :** Livestock, non-conventional feed, feeding practices, improved dairy husbandry practices (IDHPs)

### INTRODUCTION

Dairy sector has made significant progress and produces 88 million tonnes of milk. India ranks first in the world in milk productions. To boost milk production, animal nutritional research interventions to harness the existing genetic production potential optimally of our livestock is essential. Crop residues, roughages, non-conventional feeds and agricultural and agro industrial byproducts will continue to be the major inputs as livestock feed for the ruminants. Unfortunately, the existing technologies for improving digestibility of straws have not been used by the farmers. The need is to use biotechnological techniques to develop the recombinant microbes to digest straws and make available energy for livestock feeding.

Efforts are also needed to augment production of green fodder and grasses through increasing area under fodder crops, agro-forestry, etc. The issue of shortage of fodder seeds need to be addressed on priority. Feed quality standards need to be updated and enforced to ensure availability of quality compounds feed at reasonable cost to the livestock owners at their doorsteps. In this context to find out the extent of adoption of recommended improved feeding practices in the area having assured irrigation facilities and area having less irrigation facilities, the investigation was planned, to assess the extent of adoption of improved feeding practices in the areas, one having assured irrigation facilities and another having less irrigation facilities; and determine the relationship between selected variables of dairy farmers and improved feeding practices with two specific objectives

### METHODOLOGY

The Aligarh district comprises of 12 blocks. The whole district was divided into two parts according to their homogeneity, *i.e.* one having assured irrigation facilities and another having less irrigation facilities. Three blocks from each part were selected by stratified random sampling. Hence, six blocks were selected for this purpose. Out of six selected blocks, 2 villages from each block were selected randomly. From each village 25 farmers were selected, 5 from each category (*i.e.* landless, marginal, small, medium and large) by stratified random sampling. The selected farmers possessed at least one milch animal. Therefore, in all 300 farmers were selected for the proposed study. Data were collected through personal interview with the help of a schedule developed for the study.

### RESULTS AND DISCUSSION

#### Adoption of Feeding Practices

The data from Table 1 showed that 52.00 and 81.33 per cent of the farmers in assured irrigated and less irrigated area adopted the feeding practices to a medium level, respectively. About 35.00 per cent of farmers in assured irrigated area had high level of adoption and 13.33 per cent had low level of adoption. But in less irrigated area, a meager percentage (2.0%) of farmers was found in high category of adoption. There was not much difference in the low adoption category (13.33 and 16.67%) in assured and less irrigated area, respectively. In pooled samples, the majority of the farmers (67.67%) belonged to medium category of adoption.

<sup>1</sup> SMS (Agricultural Extension), KVK, Badwani (Madhya Pradesh) <sup>2</sup> District Extension Specialist (Extension Education), Choudhary Charan Singh Harayana Agricultural University, Krishi Vigyan Kendra, Kurukshetra (Harayana)

**Table 1 : Distribution of farmers according to level of adoption of improved feeding practices**

Category (scores)	Assured irrigated (n=150)	Less irrigated (n=150)	Pooled (n=300)
Low (<9.59)	20 (13.33)	25 (16.67)	45 (15.00)
Medium (9.59-15.95)	78 (52.00)	112 (81.33)	200 (67.67)
High (>15.95)	52 (34.67)	3 (2.00)	55 (18.33)

Figures in parenthesis indicate percentage

**Practice-wise extent of adoption**

The data presented in Table 2 revealed that majority of the farmers (80.67%, 84.67%, 78.0% and 80.00%) in assured irrigated and less irrigated area cultivated and used hybrid for their animals, respectively. In assured irrigated area, marginally high (46.67%) percentage was found compared to less irrigated area (12.67%) in case of

feeding balanced diet to their calves. About 17.00 per cent farmers used balanced feed to their calves in assured irrigated area, whereas, none was found in less irrigated area. Wide variation existed in feeding balanced feed to their animals (27.33% and 3.33%) in assured irrigated and less irrigated area respectively. In pooled sample, the majority of the farmers (82.33%) fed hybrid fodder to their animals followed by 79.33 per cent in cultivation of hybrid fodder. The least (46.34%) adopted practice was balanced diet to animals. Almost equal percentage (38.33 and 40.33%) of the farmers did not adopt feeding of balanced feed and providing mineral mixture to their animals respectively. About 36, 23 and 40.00 farmers continued adopted rejected after adoption and not adopted mineral mixture, respectively. Similar results were reported by Meena (2007).

**Table 2: Practice wise extent of adoption of feeding practices**

Feeding practices	Assured irrigated area (n=150)			Less irrigated area (n=150)			Pooled (n=300)		
	Continued adoption	Rejection after adoption	Not adopted	Continued adoption	Rejection after adoption	Not adopted	Continued adoption	Rejection after adoption	Not adopted
Feeding of balanced diet to their calves	70 (46.66)	43 (28.67)	37 (24.67)	19 (12.67)	63 (42.00)	68 (45.33)	89 (29.67)	106 (35.33)	105 (35.00)
Feeding of balanced diet to their heifers	25 (16.67)	75 (50.00)	50 (33.33)	0 (0.00)	76 (50.67)	74 (49.33)	25 (8.33)	151 (50.33)	124 (41.34)
Feeding of balanced diet to their adults	41 (27.33)	83 (42.00)	46 (30.67)	5 (3.33)	76 (50.67)	69 (46.00)	46 (15.33)	139 (46.34)	115 (38.33)
Cultivation of hybrid fodder	121 (80.67)	5 (3.33)	24 (16.00)	117 (78.00)	5 (3.33)	38 (18.67)	238 (79.33)	10 (3.33)	52 (17.34)
Use of hybrid fodder for their animals	127 (84.67)	1 (0.67)	22 (14.66)	120 (80.00)	2 (1.33)	28 (18.67)	247 (82.33)	3 (1.00)	50 (16.67)
Providing mineral mixture to animals	88 (50.67)	14 (9.33)	48 (32.00)	21 (14.00)	56 (37.33)	73 (48.67)	109 (36.33)	70 (23.33)	121 (40.34)

Figures in parenthesis indicate percentage.

**Differences in adoption**

It could be seen from Table 3 that both the samples were having highly significant differences in adoption of feeding (t=67.36) practices. Thus, adoption of feeding practices was high in assured irrigated area which might be owing to more extension contacts and high knowledge about IDHPs and favourable attitude towards dairy farming. The highly significant difference in adoption of these practices would have resulted in high milk production and assured irrigation availability, large number of AI centers in assured irrigated area.

**Table 3: Mean difference in adoption of improved feeding practices**

Practices	Assured irrigated area		Less irrigated area		t-value
	Mean	S.D.	Mean	S.D.	
Feeding	13.63	3.53	11.61	11.61	67.36**

\*\* Significant at 1% level.

A perusal of the correlation coefficient Table 4 in respect of herd size, milk production, milk sale, extension contact, mass media exposure and attitude towards dairy farming were found with positive and highly significant (P<0.01) in assured irrigated area, whereas, it was found unrelated in less irrigated area. Membership of village panchayat had positive and significant (P<0.05) relation with adoption of feeding practices in assured irrigated area, while there was no relation in less irrigated area. Age was found to be negative and significantly (P<0.05) related in assured irrigated area, whereas there was no relationship in less irrigated area. Regarding feeding, disease control and their management and overall constraints were found negatively and highly significant (P<0.01) association with adoption of feeding practices in both assured and less irrigated areas. Breeding and marketing constraints had no relation in less irrigated area with adoption of feeding practices, whereas breeding and

feeding constraints had negative and significant ( $P < 0.05$  and  $P < 0.010$ ) relation with adoption of feeding practices, respectively. In pooled sample, land holding, herd size, milk production, milk consumption, milk sale, family size, extension contact, mass media exposure, economic motivation, attitude towards dairy farming and knowledge about IDHPs were found to have positive and highly significant ( $P < 0.01$ ) relationship with adoption of feeding practices. The findings are compliance with that the Jha (1998), who found negative and highly significant ( $P < 0.01$ ).

Only three variables, namely, age, education and membership of village panchayat, had no relation with adoption of feeding practices. It could be observed from the above findings that higher the herd size, milk production, milk consumption, milk sale, membership of village dairy cooperatives, extension contact, mass media exposure, attitude towards dairy farming and knowledge about IDHPs were having high level of adoption.

**Table 4 : Correlation coefficient of farmers selected traits and adoption of feeding practices**

Traits	Assured irrigated area ('r' value)	Less irrigated area ('r' value)	Pooled ('r' value)
Age	-0.1948**	0.1918	0.0164
Education	0.4429**	-0.0433	0.1485
Herd size	0.5598**	0.3875**	0.4655**
Land holding	0.4890**	0.4504**	0.5118**
Milk production	0.5104**	0.2810**	0.4855**
Milk consumption	0.5356**	0.2203*	0.4924**
Milk sale	0.4866**	0.2804**	0.4670**
Membership of village Panchayat	0.1562	0.0423	0.0514
Membership of village dairy cooperative	0.2071*	0.1421	0.2643**
Family size	0.1748	0.3123**	0.2558**
Extension contact	0.6201**	0.3571**	0.5836**
Mass media exposure	0.5359**	0.2775**	0.4650**
Economic motivation	0.3702**	0.1195	0.3440**
Attitude towards dairy farming	0.5539**	0.3406**	0.5184**
Knowledge about IDHPs	0.5389**	0.1580	0.4646**
Breeding constraints	-0.2685*	-0.1780	-0.3445**
Feeding constraints	-0.6301**	-0.4213**	-0.5603**
Disease control and their management constraints	-0.4143**	-0.3353**	-0.4749**
Marketing constraints	-0.5680**	-0.1686	-0.4782**
Overall constraints	-0.5123**	-0.3043**	-0.5062**

\* Significant at 5% level \*\* significant at 1% level.

### Relationships among different variables

It could be observed from the Table 5 that in case of assured irrigated area, seven variables were subjected to first stage of multiple regression but only two variables, namely knowledge about Improved Dairy Husbandry Practices (IDHPs) and feeding constraints in adoption of IDHPs, showed significant relationship with adoption of feeding practices, while in case of less irrigated area six variables out of seven variables were found significant. The value of  $R^2$  was 0.5490 in assured irrigated area indicating that 54.90 per cent variation in the adoption of improved feeding practices could be explained by these seven variables while, in less irrigated area it was 33.61 per cent.

The feeding constraints in both the area had highly negative significant ( $P < 0.01$ ) relationship with improved feeding practices. The data were further subjected to second stage of multiple regression analysis. The three variables, namely milk production, attitude towards dairy farming and feeding constraints in adoption of IDHPs, indicate that 49.44 per cent variation could be explained in the adoption of improved feeding practices in assured irrigated area, while it was 32.68 per cent variation could be explained through milk production, extension contact, economic motivation attitude towards dairy farming, knowledge about IDHPs and feeding constraints in adoption of IDHPs in case of less irrigated area as evident from Table 5. The F-value in both the areas were highly significant.

### Effect of different variables on adoption of improved feeding practices

The results of path analysis could be seen in Table 6 indicates that feeding constraints in assured irrigated area (-0.631) and in less irrigated area (-0.3071) had high negative total direct effect, while mass media exposure (0.5357) and knowledge about improved dairy husbandry practices (0.4588) had high total indirect effect in assured and less irrigated areas respectively.

Most of the variables channeling their first indirect substantial effect through extension contact in assured as well as less irrigated area. It could be concluded that in both the areas extension contact was playing major role in enhancing the adoption of improved feeding practices, therefore, the extension functionaries must have frequent visit with farmers and change their thinking towards dairying.

**Table 5: Multiple regression analysis of farmers selected traits with the adoption of improved feeding practices**

Traits of first stage	Assured irrigated				Assured irrigated			
	b-value	t-value	R <sup>2</sup>	F-value	b-value	t-value	R <sup>2</sup>	F-value
I. Milk production	0.0230	1.8434			0.0484	2.4016*		
II. Extension contact	0.3523	3.1604			0.4687	3.1020*		
III. Mass media exposure	0.0549	0.5082			0.1241	1.4085		
IV. Economic Motivation	0.2562	1.0246	0.5490	24.69**	0.6079	3.0290*	0.336	10.27**
V. Attitude towards dairy farming	0.2863	2.3292*			0.2154	2.2434*		
VI. Knowledge about IDHPs	0.0678	0.6967			0.2942	2.7716*		
VII. Feeding constraints in the adoption of IDHPs	-0.3488	3.9593**			-0.3547	4.0038**		
<b>Traits of second stage</b>								
I. Milk production	0.0389	3.0775**			0.0510	2.5356*		
II. Extension contact	-	-	0.4944	47.58**	0.5406	3.7877**		
III. Mass media exposure	-	-			-	-		
IV. Economic Motivation	-	-			0.5636	2.8336*	0.3268	11.57**
V. Attitude towards dairy farming	0.2967	0.34122**			0.2132	2.2137*		
VI. Knowledge about IDHPs	-	-			0.2706	2.5727*		
VII. Feeding constraints in the adoption of IDHPs	-0.4482	5.1585**			-0.3568	4.0140**		

\* Significant at 5% level \*\* Significant at 1% level

**Table 6: Path analysis of farmers selected traits with the adoption of improved feeding practices**

Traits	r-value	Direct effect	Total indirect effect	Substantial indirect effect		
				I	II	III
<b>Traits of assured irrigated area</b>						
Milk production	0.5104	0.1324	0.3778	0.1554(2)	0.1433(3)	0.0984(5)
Extension contact	0.6201	0.2955	0.3247	0.1672(7)	0.1134(5)	0.0696(1)
Mass media exposure	0.5359	0.0448	0.5357	0.2001(2)	0.1656(7)	0.1433(5)
Economic motivation	0.3702	0.0849	0.4734	0.1718(5)	0.1289(7)	0.0339(6)
Attitude toward dairy farming	0.5539	0.2379	0.3159	0.1669(7)	0.1409(2)	0.0547(1)
Knowledge about IDHPs	0.5389	0.0603	0.4788	0.1730(2)	0.1664(5)	0.1669(7)
Feeding constraints in the adoption of IDHPs	-0.6301	-0.3005	-0.3295	0.0364(2)	0.0247(3)	-0.0132(6)
<b>Traits of less irrigated area</b>						
Milk production	0.2810	0.1956	0.0854	0.1955(1)	0.1177(5)	0.1032(2)
Extension contact	0.3571	0.3068	0.0475	0.3098(2)	0.0907(7)	0.0764(3)
Mass media exposure	0.2775	0.1272	0.1497	0.1853(2)	0.1277(3)	0.1265(5)
Economic motivation	0.1194	0.2874	0.4067	0.1785(2)	0.1584(5)	0.0942(7)
Attitude toward dairy farming	0.3406	0.2569	0.0834	0.1919(2)	0.1334(7)	0.0895(1)
Knowledge about IDHPs	0.1580	0.3009	0.4588	0.1856(5)	0.1837(2)	0.0962(1)
Feeding constraints in the adoption of IDHPs	-0.4213	-0.3071	-0.1141	0.0881(4)	0.0871(6)	-0.0311(3)

### CONCLUSION

It could be concluded that majority of the farmers in assured irrigated and less irrigated area adopted the feeding practices to a medium level. Further, the adoption of feeding practices was high in assured irrigated area which might be owing to more extension contacts and high knowledge about IDHPs and favourable attitude towards dairy farming. The highly significant difference in adoption of these practices would have resulted in high milk production and assured irrigation availability, large number of AI centers in assured irrigated area.

Three variables milk production, attitude towards dairy farming and feeding constraints in adoption of IDHPs control maximum variation in the adoption of improved feeding practices in assured irrigated area, while it was controlled by milk production, extension contact, economic motivation attitude towards dairy farming in less irrigated area. Most of the variables channeling their first indirect substantial effect through extension contact in assured as well as less irrigated area. In both the areas, extension contact was playing major role in enhancing the adoption of improved feeding practices, therefore, the extension functionaries must have frequent visit to farmers and change their thinking towards dairying.

### REFERENCES

- Jha, P.K. 1995. *Interpersonnel communication behavior of dairy farmers of Darbhanga district of Bihar*, M.Sc. Thesis, National Dairy Research Institute, Karnal Haryana
- Sah, A.K. 1996. *A descriptive study of existing dairy farming practices and constraints in adoption of improved dairy practices among dairy farmers in banka district of (Bihar)*. Msc. Thesis, National Dairy Research Institute, Karnal Haryana.
- Meena, M.L., N.K. Sharma and Aishwarya Dudi. 2007 Buffalo Keepers' Adoption about Improved Buffalo Production Practices. *Indian Research Journal of Extension Education* 7 (2&3): 65-68
- Rathore, R.S., Singh, Rajvir, Kachwaha, R.N. and Kumar, Ravinder 2010. Existing management practices followed by the cattle keepers in Churu district of Rajasthan 2010. *Indian Journal of Animal Science* 80 (8): 798-805