Profitability of Cross Breeding among the Dairy Farmers

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ABSTRACT

The study was conducted in Bareilly district of Uttar Pradesh by collecting data from 120 cattle owning households hailing from 12 villages .The results of study highlighted that about 57 per cent of the beneficiaries as compared to about 27 per cent of the non-beneficiaries were generating income between Rs. 15000-25000 annually through dairying. Employment generation from dairy husbandry was positively and significantly correlated with, family education status, family size, milk disposal behavior, economic motivation, herd size, land holding and information seeking behavior . Income from dairy husbandry increased with the increased lactation length, lactation yield and sale of milk. Average calving interval, income from dairy animals among the beneficiaries were found to be positively and significantly correlated with the variables selected under study related to production, indicating that income from dairy husbandry increased with the increased lactation length, lactation yield and sale of milk

Key Words : *Profitability; Crossbreeding; Income generation; Employment generation; Dairying;*

In India, agriculture and animal husbandry are the two main occupational support systems which anchor the entire social and economic structure of the village life. Livestock is one of the largest resources in our rural economy which has the highest potential for becoming the most effective instrument to fight underemployment and unemployment for livelihood security in rural areas. Dairying also generates a continuous stream of employment and absorbs income shocks due to crop failure. It reduces seasonality in livelihood pattern particularly of the rural poor (*Birthal and Ali, 2005*). In order to make dairying as more profitable through regular flow of income, various cattle interventions/technologies have been introduced through many development programs of government, NGO and private organizations. BAIF is one amongst these organisations which is providing 'door to door services'/ cattle interventions through Artificial Insemination in the rural areas. Efforts were made to study the profitability of crossbreeding in terms of employment and income generation among the respondents with the hope of improvement in production performance of milch animals, employment and income generation among poor families and also promoting economic and eco-friendly animal husbandry practices, which million of small and marginal farmers are looking forward for their sustainable livelihood. Keeping the above background in mind, this study was undertaken with the objective to assess profitability of cross breeding on income and employment generation among the dairy farmers.

METHODOLOGY

The present study is conducted in purposively selected two blocks, due to existence of cattle breeding interventions under the BAIF programme namely, Bhojipura and Damkhoda, of Bareilly district in Uttar Pradesh which fall under its Midwestern plain zone. From each of the selected two blocks, three villages, having maximum number of beneficiaries of the BAIF were selected purposively. (Beneficiaries were those farm families who have been benefited through cattle breeding interventions of BAIF for the last five years preceeding the survey and have been practicing A.I. in their dairy animals). In addition of the above, three more villages where no or minimum cattle breeding intervention have been introduced, were selected purposively at an appropriate distance from the benefited villages in order to eliminate any direct or indirect

overflow of influence of BAIF's cattle breeding intervention (Non-beneficiaries referred to those farm families who were falling out of the jurisdiction of cattle breeding interventions of BAIF). Thus, six villages from each of the two proposed blocks, making a total of 12 villages (50% BAIF adopted and 50% non adopted) were finally selected for the study. Data were collected from ten cattle owning families from each of the selected 12 villages through personal interview with the help of a well structured schedule. Secondary sources as well as observations were also used for data collection.

Employment generation was denoted by man equivalent days which were computed initially by converting all women and child days into man-equivalent days viz. 1 man equivalent day = 1.25 for women days and 2 for child days, and then adding all man days and man-equivalent days together using *Yang,(1980)* formula. The respondents were then categorized into three groups as low, medium and high employment generation categories on the basis of equal class intervals between their minimum and maximum employment generation scores.

RESULTS AND DISCUSSION

In dairying, farmers generate income either from sale of farm produce or products and by-products obtained form dairy enterprises and also through sale of surplus animals. Respondents were kept in the three categories as per their responses.

A perusal of the Table 1 indicates that about 57 per cent of the beneficiaries as compared to about 27 per cent of the non-beneficiaries were generating income between Rs. 15000-25000 annually through dairying. Seventy per cent of the non-beneficiaries fell under low income group i.e. Rs. 5000-15000 per annum. About 33 per cent beneficiaries came from BAIF's adopted villages could generate even more than Rs. 25000 annually. It may be due to adoption of crossbreeding services provided by BAIF. Finding of the present study are supported from the study conducted by *Nishi et al. (2006),* who reported a significantly higher level of knowledge and adoption about improved dairy farming practices among beneficiaries of Intensive Mini Dairy Project of Uttar Pradesh.

Dairy husbandry provides ample opportunities to work and needs much more support of human labor. Farmers get most of their labor from their family and sometimes also hire to carry out the dairy related activities. Family labor significantly contributes in raising family income. An attempt was made to find out the extent of employment generated by taking dairying as an income generating unit.

Table 2 clearly indicates that majority of the beneficiaries (48.33%) could generate either employment of more than 510 or between 360-510 man equivalent days per year through dairying. Majority of non-beneficiaries (66.67%) fell under the low category of employment generation i.e. 210-360 and

Table 1. Distribution of respondents according to their income generation through dairy husbandry (N=120)

S. No.	Income generation (Rs./annum)	Beneficiaries (n=60)	Non-beneficiaries (n=60)	Pooled (N=120)
1.	Low (5000-15000)	6 (10.00)	42 (70.00)	48 (40.00)
2.	Medium (15000-25000)	34 (56.67)	16 (26.67)	50 (41.67)
3.	High (>25000)	20 (33.33)	02 (03.33)	22 (18.33)

Figures in parentheses indicate percentage

Table 2. Distribution of respondents according to the extent of employment generation through dairy husbandry

S. No.	Employment generation (man eq. days/year)	Beneficiaries (n=60)	Non-beneficiaries (n=60)	Pooled (N=120)
1.	Low (210-360)	6 (10.00)	40 (66.67)	46 (38.33)
2.	Medium (360-510)	25 (41.67)	14 (23.33)	39 (32.50)
3.	High (>510)	29 (48.33)	6 (10.00)	35 (29.17)

Figures in parentheses indicate percentage

only 10 per cent could generate over 510 man equivalent days per year through dairying. also reported that majority of the SHG's groups could generate 366-516 man equivalent days per year through dairying in Faizabad. BAIF has also demonstrated that a family maintaining these crossbred cows can enjoy gainful self employment of 200 person days and earn an annual income of Rs. 20000 to come out of poverty. *Meena et al. (2009)* studied the impact of dairy cooperatives on income and employment generation of milk producers in Rajasthan found that the average net income was significantly higher (Rs. 13,285.30) in the member group than non-member group (Rs. 3,602.75). The overall labour utilization per annum per household was also significantly higher (207.36 man days) in the member group than the non-member group (181.92 man days). The study noticeably indicated a positive impact of dairy cooperatives on the income and employment generation of milk producers in the study area.

Differences in mean values of profitability of dairy husbandry through income and employment generation within beneficiaries and non-beneficiaries : Income and employment generation differed significantly among beneficiaries over five years after joining the BAIF. Beneficiaries had comparatively more number of crossbred animals, acquired higher per day milk yield with more lactation length and marketed more quantity of milk, thus required more family labour and generated more employment. The findings are supported by *Manjunath (2003)* who also reported that adopters in Karnataka cattle breeding centre had higher gross livestock income (Rs. 20127.26) than non-adopters (Rs. 12034). The significant differences in the income and employment generation over a period of 5 years among the beneficiaries and non-beneficiaries are presented in the Table 3.

Mean difference in employment generation however, could not differ significantly among them. Slight increase in milk production due to rearing of higher milk yielding desi breed and gradual improvement in feeding, management and health services may be the reasons for generated more income by the non-beneficiaries also.

Correlation analysis between socio-personal and economic variables with income and employment generation: The data in Table 4 clearly indicate that Except age, income generated by the beneficiaries from dairy husbandry was positively and significantly ($P<0.01$) correlated with, family education status, family size, milk disposal behavior, economic motivation, herd size, land holding and information seeking behavior. All these independent socio-economic variables were found to be of significant importance for respondents as they exerted influence on them through income generation. Age of the beneficiaries showed non-significant and negative relationship. It might be because of the fact that old aged persons are more reluctant to adopt cross breeding thus resulted in low production and productivity of milch animals and generated less income. *Sawarkar et al. (2001)* reported similar findings that the chronological age of cattle owners and the extent of adoption of AI practices were negatively but significantly related. The findings implied that larger family size utilized more labor for better care and management of dairy animals due to increased milk productivity thus could generate more employment. Higher family education status motivated the beneficiaries for better extension contact to have better knowledge and skills in scientific dairy husbandry. Larger land size was the important indicators of socio-economic status which further indicated the capacity of minimum capital investment of a farmer which was necessary to run a dairy farm. Further, larger size of land provided the

Table 3. Differences in mean values of income and employment generation within beneficiaries and non-beneficiaries

Variables	Beneficiaries			Non-beneficiaries		
	Before 5 years	After 5 years	t-value	Before 5 years	After 5 years	t-value
Income generation	6263.33±238.80	19842.32±449.08	8.08**	6242.55±242.83	10405.86±441.46	3.54**
Employment generation	270.55±5.92	503.18±11.19	12.17**	265.80±7.07	299.13±12.22	1.56NS

**Significant at 1 per cent level of significance, NS Non-signfiicant

opportunity to cultivate more green fodder and concentrate for feeding to the dairy animals which further helped in augmenting the milk production and subsequently more income. The importance of total family resources and availability of technical inputs in enhancing milk production was also revealed by *Kumar (2008)*. He found that except age income generated by the group members from dairy husbandry was positively and significantly (P<0.01) correlated with family size, family education status, type of house, material possession, type of animal house, land holding, herd size and extension contact and participation in extension activities. Family size, milk disposal behavior, herd size, land holding (P<0.01) and economic motivation (P<0.05) were found to be positively and significantly correlated with income generation amongst the non beneficiaries also whereas age, family education status and information seeking behavior were non-significantly related. It may be due to less availability of crossbreeding services in their proximity and low information seeking behaviour leads to non adoption of crossbreeding despite of the improvement in economic motivation among non-beneficiaries.

Thus income generating activities from livestock enterprise were highly correlated among the respondents of BAIF adopted village. Non-beneficiaries could also able to improve livestock income, might be due to improved management practices and larger herd size, but was comparatively lower than income generated by beneficiaries from dairy enterprise.

With respect to employment generation, Table 4 further shows a positive and highly significant (P<0.01) relationship of employment generation with family education status, family size, milk disposal behavior, economic motivation, herd size, land holding and information seeking behavior indicating that higher family education status, larger family size, better milk disposal facilities fetched better price of milk due to larger herd and land size, more information seeking behavior and higher economic motivation among the beneficiaries, led to generation of more employment among the family members. A negative and non-significant relationship was observed between employments generated among beneficiaries with their age. It revealed that with the increase of age, the working capacity, interest in keeping more number of animals and inconvenience in managing a large dairy farm in better way reduced tremendously. In rural areas, the labor required to run a dairy farm is derived mainly from family labor rather than hired labor. So, larger families had added advantage in terms of availability of labor. Similarly, the respondents who had more land, economic motivation and farming as a chief mean of earning were more interested to own more number of productive animals due to easy availability of feed and fodder. Higher family education status and higher level of extension contact of beneficiaries indicated increase in knowledge, skill and technical know-how about scientific dairy husbandry.

Table 4. Correlation analysis between socio-personal and economic variables with income generation and employment generation

SE Variables	Income generation Correlation coefficient (r)		Employment generation Correlation coefficient (r)	
	Beneficiaries	Non-beneficiaries	Beneficiaries	Non-beneficiaries
Age	0.07NS	0.01NS	0.03NS	0.01NS
Family education status	0.34**	0.08NS	0.41**	0.10NS
Family size	0.35**	0.33**	0.45**	0.42**
Family occupation	-	-	0.65**	0.56**
Milk disposal behavior	0.42**	0.32**	0.45**	0.08NS
Economic motivation	0.36**	0.16*	0.32**	0.04NS
Herd size	0.46**	0.28**	0.41**	0.36**
Land holding	0.28**	0.26**	0.54**	0.31NS
Information seeking behavior	0.32**	0.08NS	-	-

**Significant at 1 per cent level of significance *Significant at 5 per cent level of significance, NS- Non significant

Ghosh (1985) also observed that pattern of employment among rural women was significantly affected by family land holding and income. Amongst the non beneficiaries, only herd size, family size and land holding had positive and significant relationship with employment generation from dairying at one per cent level of significance

Large herd size and higher land holding among non beneficiaries created better employment opportunities for their family members. Age, family education status, milk disposal behavior and economic motivation however had insignificant impact on employment generation among them.

Correlation analysis between cattle's productions performance and related variables with income and employment generation: Table 4 revealed that except average age at first calving and average calving interval, income from dairy animals among the beneficiaries were found to be positively and significantly correlated (P<0.01) with rest of the variables selected under study related to production, indicating that income from dairy husbandry increased with the increased lactation length, lactation yield and sale of milk. Average age at first calving and average calving interval were found to be negatively but significantly (P<0.01) related. It might be due to increase in age at first calving and increase in calving interval decreased the production age of animals and productivity, thus generated less income. In other words, less age of animal's at first calving and reduction in calving interval increased the milk productivity and generated more income. Zebu cattle had a significantly higher age at first calving; thereby their productive life was lowered in comparison to their Taurus counterparts reported by *Banerjee (2002)*. *Singh (2006)* also revealed that the economic parameters such as age at first calving, calving interval, lactation yield, lactation length, dry period and milk yield were in favour of crossbreds as compared to native cattle. *Pathania and Vashist (2004)*, also reported positive impact of crossbreeding programme and observed quantum improvement in the average calving interval and milk yield per day and calving interval over time. *Natchimuthu (2002)* also found positive and significant correlation between age, education, land holding, experience in dairy farming of dairy farmers with reproductive performance of dairy cattle. *Kumar (2008)* reported positive and significantly relation (P<0.01) between income generation and average per day milk production, average milk yield per year, milk consumption per year and milk marketed per year in a study on self help group in Faizabad district, UP. In addition, higher milk availability for the family consumption was also due to higher milk production at the farm. It shows that all production related variables were found to be closely associated with income generation. Production related variables from BAIF adopted villages were highly correlated with income generation may be due to adoption of crossbreeding and rearing high producing cattle with higher milk yield, with higher lactation length and marketing of higher quantity

Table 5. Correlation analysis between cattle's production performance and related variables of diary animals with income generation and employment generation

Production performance and related variable	Income generation Correlation coefficient (r)		Employment generation Correlation coefficient (r)	
	Beneficiaries	Non-beneficiaries	Beneficiaries	Non-beneficiaries
Average age at first calving (years)	-0.58**	-0.30**	-0.32**	-0.20*
Average lactation length (days)	0.66**	0.12NS	0.68**	0.28**
Average lactation yield (liters)	0.71**	0.36**	0.61**	0.46**
Average calving interval (months)	-0.35**	0.01NS	-0.54**	0.01NS
Average per day milk yield (liters)	0.68**	0.32**	0.54**	0.42**
Average milk marketed/year (liters)	0.67**	0.36**	0.54**	0.16*

**Significant at 1 per cent level of significance *Significant at 5 per cent level of significance, NS Non significant

of milk as compared to the respondents hailing from non adopted villages of BAIF.

Among non-beneficiaries, average age at first calving, average lactation yield, average per day milk yield and milk marketed (liters per annum) were also found to be significantly (P<0.01) correlated with income generation indicating that income from dairy husbandry increased due to increase in per day milk yield and sale of milk. Average lactation length and average calving interval were not significantly correlated because crossbreeding was not adopted largely by non-beneficiaries, thus these variables did not influence and showed non-significant relationship with income generation. Increased information seeking behaviour, mass media and extension contact and participation in state department programme could influence the non-beneficiaries to a little extent to adopt the crossbreeding which might influenced in increasing the lactation milk yield and lactation length of the animals. Beneficiaries receiving the cattle breeding interventions from BAIF had increased the land holding, augmented milk productivity, annual income and employment, maintained dairy animals of higher lactation yield, less intercalving period and age at first calving.

The results of correlation coefficients in Table 5 showed highly significant (P<0.01) relationship between employment generated with the cattle production performance, employment generation among beneficiaries. *Tripathi (1991)* also reported positive and highly significant relationship between productivity of milch animals and duration of employment, activities wise involvement and overall employment status of rural women in her study conducted at Bareilly district of UP. *Kumar (2003),* in a study on self help groups in Bareilly district of Uttar Pradesh, also revealed that employment generated among the members through livestock enterprise was positively and significantly related with milk production, consumption and quantity of milk sold by a dairy onwer. Table 5 further indicated that average lactation length, average lactation yield, per day milk yield and milk marketed were positively and highly significantly correlated with employment generation, while average age at first calving and average calving interval were negatively but significantly related. The reason could be due to increase in age at first calving and calving interval resulted in decrease of production age. It led to negligence in care and management of less productive animals. However, increase in lactation length and lactation yield improved the annual milk marketing which required more family labour for its smooth working and maintenance thus provided better opportunities of employment among beneficiaries. Lactation length and average per day milk yield (P<0.01) and milk marketed per annum (P<0.05) had positive and significant relation with employment generation among non-beneficiaries also. Whereas average age at first calving and average calving interval showed non-significant correlation with employment generation from dairy husbandry. It might be because non-beneficiaries had more number of low producing animals and were also not devoting much time in their management.

CONCLUSION

The study concludes that the two variables namely, income and employment generation may be considered as important indicators to measure the success of crossbreeding practices and inturn the effectiveness of BAIF's cattle development programme. The dynamic interplay of these variables through adoption of cross breeding helped in socio economic transformation of rural people for sustainable dairy development. It is, therefore, necessary that comprehensive and integrated cattle development programmes revolving around the exploitable potentials of rural dairy farming should be developed giving due consideration to the timely, promptly and doorstep availability of effective AI facilities, input supply system and marketing facilities for the products. Suitable and appropriate training and extension interventions in dairying may help the rural families to further augment the milk production and productivity, which in turn will lead to generate more income and employment among them and thus making the crossbreeding technology more sustainable.

Paper received on : August 24, 2010

Paper accepted on : November 17, 2010

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