

# Productive Performance of Dairy Cattle of Self Help Group Members and Non-members: A Comparative Study in Kamrup District of Assam

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## Abstract

The study was conducted to assess the productive performance of dairy cattle of Self Help Group (SHG) in Kamrup district of Assam. From twenty randomly selected dairy SHG, 100 members were selected randomly and 100 non-members from the adjacent villages were selected randomly to collect data. The productivity of cows, both cross bred and indigenous, of SHG members were more in comparison to non-members. Medium lactation length of cows (249-261 days) was found in members' dairy farms (48.00 per cent), while short lactation length of cows (below 249 days) was found in the dairy farms of non-members (71.00 per cent). Members' dairy farms (44.00 per cent) were having medium dry period (5.12-6.27 months) and long dry period of cows (above 6.27 months) was found in the dairy farms of non-members (72.00 per cent). In members' dairy farms (64.00 per cent), cows were found to have medium calving interval (14.08-15.13 months) whereas long calving interval of cows (above 15.13 months) was found to be in the dairy farms of non-members (67.00 per cent). The SHG activities positively contributed in improving the productive performances of dairy cattle of the SHG members.

**Key Words:** Cattle; Dairy; Productivity; Self Help Group

## Introduction

Livestock plays an important role in the subsistence agro-based economy of Assam, India. Nearly, 85 percent of the populations of the state are engaged in agriculture and livestock sector. Despite the state is bestowed with all natural resources, it is one of the most underdeveloped states in the country. The emergence of Self Help Groups (SHGs) has assumed a significant and prominent role in social mobilization and is recognized as a tool of social engineering. The SHG approach and movement has now been accepted as an effective intervention strategy for poverty alleviation. The idea of SHG flourished in the nineties in the State and is playing an important role in empowering the poor and unrepresented section of the society silently but effectively. The process of socio-economic transformation that has begun through the SHGs is marred by the heavy indebtedness of SHG members due to loans taken from moneylenders and mortgaged of lands (Pereira, 2006). Sustainability of these SHGs is mainly dependent on financial strength and self-sufficiency of the groups. For sustainable development of the poor and rural economy, the SHGs must be self-sustainable, independent from external aid (subsidies) and the activities undertaken by them must be sustainable, otherwise the very objective of movement will be defeated. The productive performance of the dairy cows of the SHGs is probably the single most important factor that is a prerequisite for sustainability of these dairy-based SHGs. Productive and reproductive traits are crucial factors that determine the success of the dairy farms of the SHGs. The success of dairy production in SHG programmes in particular needs to be monitored regularly by assessing the productive performance under the existing management system. However, information is limited about the productive performance of dairy cows in SHGs farms in the India, particularly in Assam. Hence, the present investigation is undertaken to assess the performance of dairy cows of the dairy farms of these SHGs.

## Materials and Methods

The study was conducted in purposively selected Kamrup district of Assam. From the district, twenty dairy-based SHGs were selected randomly and from each selected group, 5 members i.e. 100 members were selected randomly to collect data. Correspondingly, 100 non-members from the adjacent villages with similar socio-economic background were selected randomly to collect data on performance of dairy cattle. For the present study, productive traits, viz. production efficiency, lactation length, dry period, calving interval were selected. Data were collected with an interview schedule. The collected data were scored, compiled, tabulated and subjected to various appropriate statistical tools including frequencies, percentage, mean, cumulative square root frequency, Standard Deviation (SD) and Z-test tests to draw meaningful results and logical conclusion.

## Results and Discussions

### Production Efficiency of Cows

Productivity is the efficiency of input on output. Productivity of the animal is crucial for the economic viability of the farms. The productive efficiency for the both crossbred and local animals and overall productive efficiency of the farms are presented in the Table 1. The production efficiency of crossbred animals, in majority of members' farms (45.00 per cent) were medium (3.49-4.83 litre/animal) while in 69.00 per cent of the non-members' dairy farms, the production efficiency of the crossbred cows was low (below 3.49 litres/animal). The average production efficiency of the crossbred cows of the members and non-members differed significantly and positively at 1 per cent level of probability. Miazzi et al. (2007) reported that the average daily milk production of local, Shahiwal x Local, Friesian x Local and Jersey x Local dairy cows were  $2.26 \pm 0.19$ ,  $4.9 \pm 0.95$ ,  $6.0 \pm 1.0$  and  $5.71 \pm 0.87$  liter respectively. It is seen that in majority of farms of members (53.00) and non-members (39.00 per cent), the production efficiency of the local animals was found to be medium (1.19-1.61 litre/animal), respectively. Sarkar et al. (2007) found average daily milk yield of 3.59 kg in local cattle of West Bengal, Habib et al. (2003) found milk yield per day of Red Chittagong cow to be  $2.55 \pm 0.11$  litres, Khan et al. (2000) observed an average daily milk yield under farm and rural conditions to be  $2 \pm 0.65$  kg and  $1.80 \pm 0.87$  kg, respectively, which are higher than the result of present study. But Koirala et al. (2011) found the mean milk yield per day was  $1.33 \pm 0.408$  litre in local cow of Sylhet, which is lower than the finding of present study. A perusal of the Table 1 reveals that in most of the dairy farms of members (55.00 per cent), the overall production efficiency was medium (2.24-3.26 litre/animal) while in 79.00 per cent of the non-members' dairy farms, the production efficiency was low (below 2.24). The production efficiency in the farms of the members ranged from 1.86 to 6.12 litre/animal while that for the non-members' farms varied between 1.16 to 5.18 litre/animal. The mean production efficiency of the farms of the members and non-members showed a significant difference at 1 per cent level of significance. This might be due to keeping of good quality animals, adoption of improved management practices and feeding of quality feed and fodder to the animals by the members. The above mentioned findings are similar with the findings of various researches, namely, Verma (1993) and Chinnayan (1979) who also recorded that the milk productivity of the animal reared by members of

**Table 1. Production efficiency of cows of the respondents**

Categories (litres/animal)	Frequency & Percentage		Mean $\pm$ SD		Z-stat
	Member	Non-Member	Member	Non-Member	
<b>A. Crossbred</b>					
Low (<3.49)	28	69	4.56 $\pm$ 1.38	3.43 $\pm$ 0.89	5.36**
Medium (3.49-4.83)	45	23			
High (>4.83)	27	8			
<b>B. Local</b>					
Low (<1.19)	12	34	1.53 $\pm$ 0.63	1.34 $\pm$ 0.56	1.36
Medium (1.19-1.61)	53	39			
High (> 1.61)	35	27			
<b>C. Overall Production Efficiency</b>					
Low (<2.24)	14	79	3.17 $\pm$ 0.79	2.21 $\pm$ 0.98	6.84**
Medium (2.24-3.26)	55	16			
High (> 3.26)	31	5			

\*\* Significant at 1 per cent level of significance

**Table 2. Lactation length of cows of the respondents**

Categories (in days)	Frequency & Percentage		Mean $\pm$ SD		Z-stat
	Member	Non-Member	Member	Non-Member	
<b>A. Crossbred</b>					
Short (<255)	19	51	270.83 $\pm$ 15.16	255.48 $\pm$ 10.45	22.88**
Medium (255-273)	53	28			
Long (> 273)	28	21			
<b>B. Local</b>					
Short (<227)	24	54	242.72 $\pm$ 7.85	232.68 $\pm$ 6.41	7.34**
Medium (227-251)	59	33			
Long (> 251)	17	13			
<b>C. Overall Lactation Length</b>					
Short (<249)	25	71	257.83 $\pm$ 18.62	243.97 $\pm$ 27.59	19.76**
Medium (249-261)	48	18			
Long (>261)	27	11			

\*\* Significant at 1 per cent level of probability

**Table 3. Dry period of cows of the respondents**

Categories (in months)	Frequency & Percentage		Mean $\pm$ SD		Z-stat
	Member	Non-Member	Member	Non-Member	
<b>A. Crossbred</b>					
Short (<4.10)	21	9	4.98 $\pm$ 1.03	6.06 $\pm$ 1.56	-2.97**
Medium (4.10-5.52)	56	23			
Long (> 5.52)	23	68			
<b>B. Local</b>					
Short (<6.16)	14	9	7.76 $\pm$ 2.34	8.48 $\pm$ 2.89	-1.98*
Medium (6.16-7.79)	52	31			
Long (> 7.79)	34	60			
<b>C. Overall Dry Period</b>					
Short (<5.12)	23	7	6.18 $\pm$ 0.81	7.29 $\pm$ 1.12	-2.93**
Medium (5.12-6.27)	44	21			
Long (> 6.27)	33	72			

\* Significant at 5 per cent level of probability, \*\* Significant at 1 per cent level of probability

**Table 4. Calving interval of cows of the respondents**

Categories (in months)	Frequency & Percentage		Mean $\pm$ SD		Z-stat
	Member	Non-Member	Member	Non-Member	
<b>A. Crossbred</b>					
Short (<13.12)	11	7	14.17 $\pm$ 0.77	14.84 $\pm$ 0.98	-2.08*
Medium (13.12-14.32)	54	42			
Long (>14.32)	35	51			
<b>B. Local</b>					
Short (<14.62)	13	12	16.10 $\pm$ 1.23	16.41 $\pm$ 1.47	-1.85
Medium (14.62-16.13)	69	58			
Long (>16.13)	18	30			
<b>C. Overall Calving Interval</b>					
Short (<14.08)	19	5	14.96 $\pm$ 0.68	15.88 $\pm$ 1.09	-5.07**
Medium (14.08-15.13)	64	28			
Long (>15.13)	17	67			

\* Significant at 5 per cent level of probability, \*\* Significant at 1 per cent level of probability

cooperative societies was significantly higher than that of the non-members. It was found that the amount of milk yield greatly depend on the quality and amount of feed given by the farmers as well as frequency of feeding and the health of the dairy cattle. It was observed that while some farmers could afford to feed the dairy cattle thrice daily, others could feed only twice a day and the quality of feeds given by the farmers were also vary depending upon their economic status. Difference in genetic architecture, feeding system, quality and quantity of ration, milk man and time of milking may be affecting the daily milk yield of cows.

#### **Lactation Length of Cows**

Table 2 reveals a significant difference at 0.01 level of probability between members and non-members regarding mean lactation length of crossbred cows. It was found to be short in crossbred cows of non-members (255.48 days) than that of crossbred cows of members (270.83 days). The same table also reveals that in more than half of the farms of members (53.00 per cent), the lactation length for crossbred cows was found to be medium (255-273 days) while in 51.00 per cent of farms of non-members, the lactation length of crossbred cows were short (below 255 days). A significant difference at one per cent level of probability was found between the mean lactation length of local cows of members and non-members (Table 2). As indicated in the table, 242.72 days and 232.68 days were the mean lactation length for the local cows of members and non-members, respectively. It is further observed that in most of the members' dairy farms (59.00 per cent), the lactation length of local cows were medium (227-251 days), followed by 24.00 per cent and 17.00 per cent were having short (below 227 days) and long lactation length (above 251 days), respectively. It is further observed that in most of the non-members' farms (54.00 per cent), lactation length of local cows was found to be short. Zafar et al. (2008) observed the mean lactation length of  $267 \pm 2.29$  days in case of Pakistani Sahiwal cows during different periods and Gaur et al. (2003) reported the mean lactation length of Gir cattle breed of India was  $326 \pm 11$  days which were higher than that of the present finding. Sarkar et al. (2007) recorded the average lactation length of *Deshi* cattle of the West Bengal as 238 days, Koirala et al. (2011) found  $187.94 \pm 14.77$  days in the native cows of Sylhet and Al Amin et al. (2007) observed the mean lactation length of North Bengal Grey cattle of Bangladesh to be  $219 \pm 38.2$  days. These results are lower than that of the present finding. The data in the Table 2 indicates that overall mean lactation length of the animals (257.83 days) of dairy farms of members and that of non-members (243.97 days) differed significantly and positively at 1 per cent level of significance. It is further observed that in majority of members' dairy farms (48.00 per cent), cows were found to have medium lactation length (249-261 days). On the other hand, short lactation length of cows (below 249 days) was found to be in majority of the dairy farms of non-members (71.00 per cent). Feeding of quality fodder, more concentrate and better management practice might be the probable reasons for longer lactation length of cows of members.

#### **Dry Period of Cows**

The mean dry period of crossbred cows of members and non-members differed significantly and positively (Table 3). It was found to be less in crossbred animals of members (4.98 months) than that of crossbred animals of non-members (6.06 months). Perusal of the same table also reveals that in 56.00 per cent of members dairy farms, dry period for crossbred cows was found to be medium (4.10-5.52 months) while in majority of the non-members' dairy farms (68.00 per cent), the dry period of crossbred cows was long (above 5.52 months). The present finding on dry period was less than the findings of Gupta (2014) and Prakash (2009). The mean dry period of local cows of members and non-members differed at 5 per cent level of significance (Table 3). It is further noticed that in most of the members' dairy farms (59.00 per cent), the dry period of local cows were medium (6.16-7.79 months), followed by 34.00 per cent and 14.00 per cent were having long (above 7.79 months) and short dry period (below 6.16 months), respectively. Most of the local cows of non-members' farms (60.00 per cent), dry period were found to be long. Koirala et al. (2011) found the average dry period of local cow of Syllhet as  $220.81 \pm 15.68$  days. Zafar et al. (2008) observed the mean dry period of  $152 \pm 3.76$  days in case of Pakistani Sahiwal cows. Al Amin et al. (2007) observed the mean dry period of  $180 \pm 42.4$  days in case of North Bengal Grey cows. The present finding is higher than the findings of above mentioned researchers. The mean dry period of the animals (6.18 months) of members and that of non-members (7.29 months) were found to be differed significantly and negatively at 1 per cent level of significance (Table 3). It is further observed that in majority of members' dairy farms (44.00 per cent), cows were found to have medium dry period (5.12-6.27 months). On the other hand, long dry period of cows (above 6.27 months) was found to be in majority of the dairy farms of non-members (72.00 per cent). The probable reasons for shorter dry periods for the dairy animals of members might be attributed to more number of crossbred animals, high conception rate of animals and adoption of improved practices in the farms. The longer dry period in local cows might be due to poor quality and quantity of ration and nutritional status of the animals.

#### **Calving Interval of Cows**

Perusal of data furnished in the Table 4 reveals that mean calving interval of crossbred cows of members and non-members showed a significant difference at 5 per cent of probability. It was found to be less in crossbred animals of members (14.17 months) than that of crossbred animals of non-members (14.84 months). In the same table, it is seen that in 54.00 per cent of members' dairy farms, calving interval for crossbred cows was found to be medium (13.12-14.32 months) while in majority of the non-members' (51.00 per cent) dairy farms, the

calving interval of crossbred cows was long (above 14.32 months). The average calving inter period estimated in this study is in conformity with the finding of Prakash (2009) while higher than the estimates as reported by Das (2010) but less than the findings of Gupta (2014). It is observed that in 69.00 and 58.00 per cent of the dairy farms of members and non-members, the calving interval of local cows were found to be medium (14.62-16.13 months), respectively. Koirala et al. (2011) found the average calving interval of 453.47±13.181 days in local cow of Sylhet, Zafar et al. (2008) found the mean calving interval of Sahiwal cow of Pakistan to be 429±3.74 days, Sarkar et al. (2007) recorded 453±3.85 days of calving inter in local cattle of West Bengal and Habib et al. (2003) found the mean calving interval of Red Chittagong cow to be 409.9±17.8 days which were lower than the present findings. As evident from the Table 4 that the mean calving interval of the dairy animals (14.96 months) of members was found to be less as compared to that of non-members (15.88 months). It is further observed that in majority of members' farms (64.00 per cent), cows were found to have medium calving interval (14.08-15.13 months). On the other hand, long calving interval of cows (15.13 months) was found to be in majority of the dairy farms of non-members (67.00 per cent). Short calving interval in the farms of members might be due to shorter dry period, providing more concentrate and mineral mixtures, quality animals in the farms, better heat detection of animals and better management of farms. Calving interval varies due to maternal and environmental factors such as feeding, management, fertility etc. (Al Amin et al., 2007).

**Conclusion** From the present study, it can be concluded that the SHG activities positively contributed in improving the productive performance of dairy cattle of the SHG members. Though the productive performances of the cows of SHGs members were better than the non-members but below the national averages. There is lot of scope to increase the productive performance by empowering the farmers with latest information on sustainable dairy farming practices.

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