Research Article

Indian Journal of Extension Education
Vol. 58, No. 3 (July–September), 2022, (1-7)

ISSN 0537-1996 (Print)
ISSN 2454-552X (Online)

Knowledge Level of Smallholder Woman Farmers of Poultry Producer Company in Madhya Pradesh

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ARTICLE INFO

Keywords: Knowledge level, woman poultry farmers, poultry producer company, member and non-member

http://doi.org/10.48165/IJEE.2022.58301

ABSTRACT

The poultry producer companies provide trainings and extension services to their members. The present study was conducted in 2021-22 in Madhya Pradesh state to assess the impact of poultry Producer Company on knowledge level of smallholder women poultry farmers of company. Ex-post facto research design was used. Multistage sampling was done for the selection of respondents. Data was collected from randomly selected, 140 members and 140 non-members, through a structured interview schedule. Propensity score matching was applied at 0.2 tolerance level, to reduce extraneous variable effect and finally 96 members and 96 non-members respondents were selected for data analysis and interpretation of results. The majority of the members had medium to a high level of knowledge of poultry housing, brooding, litter management and feeding while medium to low level of knowledge of healthcare management, whereas, most non-members had a medium to low level of knowledge of poultry housing, litter management, feeding, and healthcare, and medium to high level of knowledge of brooding. There was a significant difference in knowledge of members and non-members at 0.1% level of significance regarding housing, litter management, and feeding and interpreted as poultry producer company had positive impact on knowledge of member poultry farmers.

INTRODUCTION

In India, Poultry industry had enormous potential, growing with CAGR of 10.5 per cent annually. Due to its potential to grow as industry it had attracted large commercial farmers leading to huge competition for traditional smallholder poultry farmers. It was reported that developing countries are experiencing paradigm shift from subsistence occupation to commercial farming (Mukherjee et al., 2012). Due to paradigm shift smallholder farmers became vulnerable due to high cost of production, lesser access of recent information, high cost of input procurement, lower scale of production, and poor linkages with market intermediaries. It has also been reported that smallholding poultry producers are vulnerable due to a lack of recent knowledge and skill on poultry farming, marketing, and input procurement (Thapa & Gaiha, 2011). Small and marginal farmers face challenges of high input cost and inability to produce efficiently (Singh et al., 2022). Livelihood security of the farmers is associated with access to resources and technical information (Dagar & Upadhyay, 2022).

To overcome the drawbacks, smallholder poultry farmers for survival in the market collectivized their resources and worked in cooperative form but didn't progress well. Cooperatives membership had potential to improve linkages and productivity of animals (Mandi, et al., 2022). In 2002, the committee under chairmanship of Y.K. Alagh, the then economic advisor to the Government of India, an amendment was proposed in the Indian Companies Act 1956 by introducing a new section IXA in section

Received 10-04-2022; Accepted 02-06-2022

581 in the Company Act 1956, which allowed the cooperatives to register under the company act and perform all activities from input procurement, marketing and profit maximization for the shareholders (Alagh, 2007 & Mukherjee et al., 2019). As evidenced the FPOs are capable of reducing transactional cost (Sakthi et al., 2015), the smallholder poultry farmers made two tier company system. They established one input supplier company Madhya Pradesh Poultry Producer Company Limited (MPWPCL) at top and 12 poultry producer companies in the second tier. MPWPCL procures inputs in wholesale from open market and distributes to the second tier producer companies in retail at lower price to the open market reducing the input cost of production of goods. Companies provide training and extension services to their producer farmers regarding housing, brooding, litter management, feeding, and healthcare management to develop capacity building in the farmers and reduce input cost and production losses with the competitive selling price. Extension services have positive impact on knowledge of the poultry farmers (Singh et al., 2018). Training to the farmers can enhance utilization of technology efficiently and effectively (Gupta et al., 2013; Raju et al., 2022). Knowledge of the poultry farmers has a direct effect on their efficiency and plays important role in decision making (Jat et al., 2022). Present study on the knowledge level of smallholder woman poultry farmers of poultry producer company in Madhya Pradesh was taken up to compare the knowledge level of producer members and non-members poultry producers.

METHODOLOGY

The study was conducted among members of poultry producer companies functional in Madhya Pradesh and non-member poultry farmers in the same region. Multistage sampling was done for data collection. Madhya Pradesh was selected for the research purpose as it was the pioneer state in establishing and converting cooperatives to producer companies. MP women poultry producer company was selected purposively as it had completed five years of gestation period. Four poultry producer companies were selected randomly. Thirty-five members were chosen randomly from each of the four poultry producer companies, and 35 non-member poultry producers residing in the vicinity of each poultry producer company randomly. Total of 280 respondents were selected for data collection. The respondent was the person who was rearing at least ten birds per flock which should not be higher than 1000 birds per flock. Landholding varied from landless to less than 2 hectares. Data collection was done through a structured interview schedule. Fifty-eight items were selected from texts and available resource material and sent to experts for relevancy opinion. 44 items were revealed as highly relevant with a weighted mean relevancy score of more than 0.75 which were used for data collection. The weighted mean relevancy score was calculated with following formula:

$$\text{Weighted mean relevancy score} = \frac{(\text{Highly relevant x 2})+(\text{Relevant x 1})+(\text{Irrelevant x 0})}{2 \text{ x Total number of expert opinion}}$$

Propensity score matching was applied to each poultry producer company member and non-members and found no exact matches, but 24, 22, 24, and 26 fuzzy matches were found at a 0.2 tolerance level. These pairs of 24 from Churhat, 22 from Singrauli, 24 from Maikal, and 26 from Kesla were used to analyze and interpret the results. For each correct response, '1' and the wrong response '0' were allotted. The arithmetic mean was calculated for each item in each group of individuals. Classification of respondents was done at low, medium, and high levels, by applying equal class interval method of classification of data (Gupta & Kapoor, 2002; Bharti, et al., 2019). The Chi-square test was applied among the producer's company members and non-members and in pooled data of members and non-members. The difference in the knowledge level was interpreted accordingly.

RESULTS AND DISCUSSION

Knowledge of poultry housing

The distribution of the poultry producer-wise respondents according to their knowledge about poultry farming is presented in Table 1. Knowledge on poultry housing was assessed through 12 items viz. suitable site for poultry house, characteristics of land for poultry house, the requirement of drinking water, location of poultry house, power supply, dampness, type of flooring, the space requirement for different category birds and its importance was assessed. It was found that the majority of members had good knowledge about quality of land for shed construction, drawbacks of insufficient space, requirement of water, and quality of the site

Table 1. Poultry producer-wise members' and non-members' knowledge of poultry housing

S.No.	Knowledge of Poultry Housing	Pooled	
		Member (N=96)	Non Member (N=96)
1.	It is better to select a site where there was no poultry activity earlier	0.56 VII	0.33 XII
2.	Land should be even, elevated, and preferably east-west rectangularly	0.75 II	0.39 VII
3.	Site should be low lying and should have water lodging	0.49 IX	0.38 IX
4.	Site should provide scope for plenty of light, water, and aeration	0.67 III	0.53 II
5.	Requirement of drinking water/bird	0.66 IV	0.51 III
6.	Shed should locate either too near to the residence or too far from the residence	0.49 X	0.48 IV
7.	Power supply should be available to the shed for brooding and lighting	0.45 XII	0.40 VI
8.	Dampness is necessary for the poultry shed	0.48 XI	0.39 VII
9.	Floor of the shed should be at ground level	0.58 VI	0.42 V
10.	Space requirement for birds depends upon	0.59 V	0.35 XI
11.	Space requirement for the adult birds in a deep litter is	0.49 VIII	0.37 X
12.	Insufficient space results in	0.75 I	0.59 I

for shed building. Most of the poultry producer company members satisfactorily performed regarding site selection of poultry farming having no poultry activity, floor quality, and space requirement for birds. In the remaining parameters, performance was poor amongst members who were supposed to improve through training (Table 1). The non-members had replied satisfactorily about drawbacks of insufficient space, light, water; aeration in the poultry shed, and water requirements. In the remaining parameters, performance was poor amongst non-members who were supposed to improve through training (Table 1). The majority (50%) of the members belonged to a medium level of knowledge of poultry housing, followed by a high level (41.67%) and low level (8.33%), while most (45.83%) of the non-member respondents belonged to a low level of knowledge of poultry housing followed by medium level (40.63%) and high level (13.34%). The members of the poultry producers had knowledge mean score of poultry housing as 7.11 with a standard deviation of 2.45. In contrast, non-members' knowledge mean score of housing was relatively lower, i.e., 5.21, with a comparatively higher standard deviation of 2.91. It was interpreted that members were more consistent in replying correct response than non-members and had higher variation among non-members. Comparison between members and non-members was done by applying chi-square. It was found that the knowledge of member poultry producers had significantly higher knowledge of poultry housing than that of non-members at a 0.1% level of significance (Table 6). It was observed that members of the poultry producer company have specific poultry sheds for the rearing of birds while non-members were rearing birds in the part of their residence; hence it was concluded that members had practical exposure to the quality of poultry shed leading to better knowledge of poultry housing, thus having better poultry sheds. Similar findings were reported by Senthilkumar et al., (2009) & Kavithaa et al., (2020), who reported that the majority of respondents had a medium level of knowledge of housing. Findings are contrary to the findings of Mandavkar et al., (2020), who had reported that most respondents were having full knowledge of poultry housing.

Knowledge of brooding

Poultry producer company-wise distribution of the respondents regarding the knowledge about brooding is presented in Table 2. Knowledge of brooding was assessed through 9 items, i.e., use of chick guard, quality of litter for brooding, temperature regulation in brooding shed, signs of poor brooding, and brooding environment. It was found that the majority of the members had good knowledge about the type of chick guards, quality of litter cover for brooding, heating arrangement in brooding house, signs of poor brooding; use and importance of chick guards. Most of the member respondents replied satisfactorily to humidity management in the shed. On the remaining parameters, performance was poor among members who were supposed to be improved through training (Table 2). It was also found that most non-members had good knowledge about the type of chick guards, quality of litter cover for brooding, and use of chick guard. Most of non-member respondents replied satisfactorily to importance of chick guard and sign of poor brooding. On the remaining parameters, performance was poor amongst non-members who were supposed to improve through training (Table 2). The majority of the members (60.42%) and non-members (53.13%) belonged to a medium level of knowledge of brooding, followed by a high level (26.04%) among members and 23.96 per cent among non-members. It was also found that few members (13.54%) and non-members (22.92%) had low knowledge of brooding. The members of the poultry producers had 5.54 mean score about knowledge of brooding with a standard deviation of 1.89. In contrast, non- members' mean score was relatively lower, i.e., 4.58, with a comparatively higher standard deviation of 2.56. It was interpreted that members were more consistent in replying correct response than non-members and had higher variation among non-members. Comparison between members and non-members was made by applying chi-square. It was found that knowledge of member poultry producers was non-significantly differing from knowledge of brooding of non-members (Table 6). It was observed that both members and non-members were practicing brooding in the initial stage of poultry farming and had good knowledge of brooding. Similar findings were reported by Senthilkumar et al., (2009); Raju et al., (2007) & Kavithaa et al., (2020), who reported that most respondents were having a medium knowledge of brooding. Findings are contrary to the findings of Mandavkar et al., (2020), who reported that most respondents had full knowledge of poultry brooding.

Knowledge of litter management

The distribution of the respondents according to their knowledge about litter management is presented in Table 3. Knowledge on litter management was assessed through 5 items viz. essential quality of litter, the thickness of litter material in different seasons, percentage of moisture in litter material, and frequency of

Table 2. Poultry producer-wise members' and non-members' knowledge of brooding

S.No.	Knowledge of Brooding	Pooled	
		Member (N=96)	Non Member (N=96)
1.	Chick guard should be placed	0.73 II	0.62 I
2.	For chick brooding, litter should be covered with	0.72 III	0.61 II
3.	Heating arrangement should be made by:	0.60 VI	0.49 VI
4.	Temperature of the brooding house should be	0.47 VIII	0.36 VIII
5.	Brooding temperature measured at …… height from floor	0.47 IX	0.35 IX
6.	Sign of poor brooding	0.61 V	0.57 IV
7.	Chick guard applied for	0.78 I	0.62 III
8.	Chick guard helps in	0.61 IV	0.56 V
9.	High humidity in the shed leads to ….	0.54 VII	0.39 VII

Table 3. Poultry producer-wise members' and non-members' knowledge of litter management

S.No.	Knowledge of Litter management	Pooled	
		Member (N=96)	Non Member (N=96)
1.	Basic qualities of the litter material	0.75 II	0.53 I
2.	Thickness of litter material spread at the time of starting in winter season	0.61 IV	0.45 IV
3.	Thickness of litter material spread at the time of starting in summer season	0.61 III	0.41 V
4.	Percentage of moisture to be maintained in the litter	0.60 V	0.45 III
5.	Stirring of litter should be done	0.77 I	0.49 II

stirring of litter material. It was found that the majority of members had good knowledge about all the parameters viz. frequency of stirring litter material, quality of litter material, thickness of litter material in different seasons and percentage of moisture in litter material. The majority of the non-members responded satisfactorily about the quality of litter material. On the remaining parameters, performance was poor amongst non-members which were supposed to improve through training (Table 4). Most (48.96%) of the members belonged to a medium level of knowledge of litter management, followed by a high level (47.92%) and low level (3.12%), while most (46.88%) of the non-member respondents belonged to a medium level of knowledge of litter management group followed by low level (36.45%) and high level (16.67%). The members of the poultry producers had a mean score of 3.34 with respect to knowledge of litter management with a standard deviation of 0.93. In contrast, non- members' mean score was lower, i.e., 2.32, with a comparatively higher standard deviation of 1.36. It was interpreted that members were more consistent in replying correct response than non-members and had higher variation among non-members. Comparison amongst members and non-members was made by applying chi-square. It was found that knowledge of member poultry producers was significantly higher than that of the knowledge of non-members at a 0.1% level of significance (Table 6). It was observed that members of the poultry producer company were using litter according to scientific standards and recommendations, while non-members were practicing according to the availability of litter material. Hence members had higher knowledge than that of the non-members. Similar findings were reported by Senthilkumar et al., (2009) & Kavithaa et al., (2020), who reported that the majority of respondents had a medium level of knowledge of litter management. Findings are contrary to the findings of Mandavkar et al., (2020), who revealed that most respondents had full knowledge of litter management.

Knowledge of poultry feeding

The distribution of the respondents according to their knowledge about feeding is presented in Table 4. Knowledge of poultry feeding was assessed through 6 items viz. percentage of total expenditure on feed, percentage of protein in poultry feed, the energy requirement of poultry, source of protein, source of carbohydrate in feed, and source of mineral in feed. It was found that the majority of members had good knowledge about the percentage of total expenditure on feed, percentage of protein in poultry feed, source of protein, source of carbohydrate in feed, and source of the mineral in feed. Most of the poultry producer company members satisfactorily performed regarding energy requirements for the bird. The majority of the non-members had replied satisfactorily about the source of protein in feed and carbohydrates in feed. On the remaining parameters, performance was poor amongst non-members who were supposed to improve through training (Table 4). The majority (55.21%) of the members belonged to a group having high level of knowledge of poultry feeding, followed by medium level (37.50%) and low level (7.29%). In comparison, most (47.92%) of the non-member respondents belonged to a group having medium level of knowledge of poultry feeding, followed by low level (41.67%) and high level (10.41%). The members of the poultry producers had mean score 4.26 about knowledge of poultry feeding with a standard deviation of 1.17. In contrast, non-members' mean score was relatively lower, i.e. 2.84, with a comparatively higher standard deviation of 1.39. It was interpreted that members were more consistent in replying correct answers than non-members and had higher variation among non-members. Comparison amongst members and non-members was made by applying chi-square. It was found that knowledge of member poultry producers was significantly higher than the knowledge of non-members at a 0.1 % level of significance (Table 6). It was observed that the poultry producer company members were using poultry feed according to scientific standards and recommendations, while non-members were feeding according to poultry feed availability. Hence members had higher knowledge than non-members. Similar findings were reported by Senthilkumar et al., (2009); Paonam and Ram, (2016) & Kavithaa et al., (2020), who reported that the majority of respondents were having a medium level of knowledge of poultry feeding. Findings are contrary to the

Table 4. Poultry producer-wise members' and non-members' knowledge of Poultry feeding

S.No.	Knowledge of Poultry Feeding	Pooled	
		Member (N=96)	Non Member (N=96)
1.	Percentage of the total expenditure incurred on the cost of feed	0.76 II	0.46 IV
2.	Percentage of protein in poultry feed	0.73 III	0.46 V
3.	Energy requirement for broiler birds	0.57 VI	0.43 VI
4.	Source of protein in feed	0.80 I	0.50 II
5.	Source of carbohydrates in feed	0.72 IV	0.52 I
6.	Source of minerals in the feed	0.68 V	0.48 III

findings of Mandavkar et al., (2020), who reported that most respondents have full knowledge of poultry feeding.

Knowledge of healthcare management

Poultry producer company-wise distribution of the respondents regarding knowledge about healthcare management is presented in Table 5. Knowledge of healthcare management was assessed through 12 items, i.e., poultry disease prevalent in the area, average mortality in batch, age of vaccination of Ranikhet disease, infectious bronchitis and infectious bursal disease., mode of administration of Ranikhet vaccine, rate of coccidiostat in feed, a sign of diarrhea, cause of mortality in the first week, second week, 3rd to 5th week and finishing weeks. The majority of the members had good knowledge about average mortality in batch, age of

Table 5. Poultry producer-wise members' and non-members' knowledge of poultry healthcare management

S.No.	Knowledge of Poultry Healthcare management	Pooled	
		Member (N=96)	Non Member (N=96)
1.	Poultry diseases prevalent in your area	0.57 V	0.47 III
2.	Average mortality in a batch	0.67 II	0.46 IV
3.	Age at which broiler vaccinated against Ranikhet	0.61 III	0.51 II
4.	Age at which broiler vaccinated against Infectious bursal disease	0.49 VI	0.40 VI
5.	Age at which broiler vaccinated against Infectious bronchitis	0.47 VII	0.38 VII
6.	Mode of administration of Ranikhet vaccine	0.59 IV	0.44 V
7.	Rate of coccidiostat for preventive measures	0.43 VIII	0.31 VIII
8.	Sign of diarrhea in poultry	0.68 I	0.55 I
9.	Mortality in the first week is due to:	0.40 IX	0.30 X
10.	Mortality in the second week is due to	0.40 X	0.31 IX
11.	Mortality in 3rd- 5th week is due to	0.33 XI	0.24 XI
12.	Mortality in finishing week is due to	0.31 XII	0.23 XII

Table 6. Distribution of women poultry farmers according to different category of knowledge of poultry farming

Knowledge of poultry farming		Pooled	
		Member (N=96)	Non Member (N=96)
A. Knowledge of poultry Housing	Low (0-4)	08 (8.33)	44 (45.83)
	Medium (5-8)	48 (50.00)	39 (40.63)
	High (9-12)	40 (41.67)	13 (13.54)
	Mean	7.11	5.21
	SD	2.45	2.91
	χ^2	39.609***	
B. Knowledge of Brooding	Low (0-3)	13 (13.54)	22 (22.92)
	Medium (4-6)	58 (60.42)	51 (53.13)
	High (7-9)	25 (26.04)	23 (23.96)
	Mean	5.54	4.58
	SD	1.89	2.56
	χ^2	2.847NS	
C. Knowledge of litter management	Low (0-1)	03 (3.12)	35 (36.45)
	Medium (2-3)	47 (48.96)	45 (46.88)
	High (4-5)	46 (47.92)	16 (16.67)
	Mean	3.34	2.32
	± SD	0.93	1.36
	χ^2	34.429***	
D. Knowledge of poultry feeding	Low (0-2)	07 (7.29)	40 (41.67)
	Medium (3-4)	36 (37.50)	46 (47.92)
	High (5-6)	53 (55.21)	10 (10.41)
	Mean	4.26	2.84
	± SD	1.17	1.39
	χ^2	53.739***	
E. Knowledge of healthcare	Low (0-4)	36 (37.50)	52 (54.17)
	Medium (5-8)	50 (52.08)	36 (37.50)
	High (9-12)	10 (10.42)	08 (8.33)
	Mean	5.95	4.59
	SD	2.13	2.25
	χ^2	5.410NS	

*=5% level of significance; **=1 % level of significance; ***=0.1% level of significance, NS=Non-Significant, In parenthesis= Percentage

vaccination of Ranikhet disease, and signs of diarrhea. Most of the members had satisfactory knowledge about poultry diseases prevalent in the study area and the mode of administration of the Ranikhet disease vaccine. In the remaining parameters, performance was poor amongst members who were supposed to be improved through training (Chaturvedani et al., 2017). Most of the non-members reported satisfactory performance in knowing signs of diarrhea and average mortality in a batch. In the remaining parameters, performance was poor amongst non-members, which is supposed to be improved through training (Table 5). The majority of the members (52.08%) belonged to a medium level of knowledge of healthcare management, followed by low level (37.50%) and high level (10.42%). In comparison, the majority (54.17%) of non-members belonged to the group having low-level knowledge of healthcare management, followed by medium level (37.50%) and high level (8.33%). The members of the poultry producers had mean score 5.95 about knowledge of healthcare management with a standard deviation of 2.13. In contrast, non-members' mean score was relatively lower, i.e., 4.59, with a comparatively higher standard deviation (2.25). It was interpreted that members were more consistent in replying correct response than non-members and had higher variation among non-members. Comparison amongst members and non-members was made by applying chi-square. It was found that knowledge of member poultry producers was non-significantly differing from knowledge of healthcare management of non-members (Table 6). It was observed that members were practicing healthcare management under the guidance of veterinarians and para-vets with minimal involvement in the diagnosis and took least efforts to learn healthcare management due to easy access to veterinary facilities, hence, low level of knowledge. At the same time, non-members didn't have access to healthcare management practices; hence non-members also had low level of knowledge of healthcare management. Similar findings were also reported by Senthilkumar et al., (2009) & Kavithaa et al., (2020), who found that most respondents had a low level of knowledge of healthcare management. These findings, however, are contrary to the findings of Mandavkar et al., (2020), who reported that most respondents had full knowledge of healthcare management.

CONCLUSION

Poultry producer company has achieved its objective of strengthening smallholder farmer by providing training and extension services. Members of poultry producer company were belonging to medium to high level of knowledge of housing, feeding and litter management which was significantly higher as compared to non-members belonging to medium to low level of knowledge and differing at 0.1% level of significance. It was found that mean knowledge score was maximum for space requirement, quality of land for poultry shed, sources of nutrients in feed and vaccination knowledge which was lacking in non-members. Members of poultry producer company have opportunity to improve their knowledge about healthcare practices as they have access to veterinarian and para-vets. Poultry producer company had positive impact on the knowledge level of the member poultry farmers which was comparatively lacking in non-member poultry farmers.

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