RESEARCH ARTICLE

Adoption of Improved Poultry Technologies amongst Members of Poultry Producer Company and Non-member Women Farmers of Madhya Pradesh, India

Raj K. Patel[1], Mahesh Chander[2]*, Med R. Verma[3], Demian C. Johnson[2]

Abstract

Poultry Producer Company is collectivizing the smallholder poultry farmers and helps them to perform poultry farming scientifically and efficiently. The present study was conducted on women poultry farmers of Madhya Pradesh to study the impact of poultry producer company on the adoption of improved technologies of poultry farming amongst smallholder farmers. Ex-post facto research design was used in the study. Multistage sampling was done for the selection of respondents and a total of 140 members and 140 non-member women farmers were selected randomly for data collection. After the application of propensity score matching, 96 members and 96 non-members were found suitable for data analysis and interpretation of results. It was found that the majority of the members had high level of adoption of improved poultry technologies while majority of non-members had medium level of adoption of poultry technologies. The adoption quotient for member and non-member farmers was 83.75 and 37.92%, respectively. There was a significant difference in the overall adoption rate of members compared to non-members at 0.1% significance.

Keywords:Adoption, Improved Poultry technologies, Poultry Producer company, Women Poultry farmer.

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Introduction

Poultry farming has opened ways of rural industrialization of agriculture allied sector because of its potential to grow at compounded rate (GoI, 2017). It has created huge competition and attracted big corporate people in this rapidly growing entity. Due to increased competition, there is pressure to create a surplus at minimum margin and reduce production losses (Hafez and Attia, 2020). To reduce production losses, farmers are supposed to adopt new and improved technologies of poultry farming to reduce production losses due to high mortality, reduced growth rate, delayed disease diagnosis, and non-availability of improved chicks and balanced feed. Smallholder poultry farmers can't procure inputs in bulk and did not have bulk finished product to cater to bulk buyers. To reduce production costs, smallholders compromise the quantity and quality of inputs and cannot cater to bulk buyers (Ramaswami *et al.* 2005, Thamizhselvi and Rao 2010). Poultry Producer Company had the potential to collectivize their members' needs, provide an edge of procurement of inputs at wholesale price, and sell the goods in bulk (Alagh 2007; Mukherjee *et al.* 2019). Poultry Producer Company makes the availability of the improved technologies of the poultry farmers. To study the role of the poultry producer company, it became important to study the adoption rate of the members of the poultry producer in the study area. Non-member farmers were selected for the study to eliminate the passive effect of the farmers' effort to adopt improved poultry farming.

[1]Department of Veterinary Extension College of Veterinary Science & A.H. Jabalpur 482001 Madhya Pradesh, India.

[2]Division of Extension Education, ICAR- Indian Veterinary Research Institute, Izzatnagar 243122, Uttar Pradesh, India.

[3]Division of Livestock Economics and Statistics, ICAR- Indian Veterinary Research Institute, Izzatnagar 243122, Uttar Pradesh, India.

Corresponding Author: Mahesh Chander, Division of Extension Education, ICAR- Indian Veterinary Research Institute, Izzatnagar 243122, Uttar Pradesh, India, e-mail: drmahesh.chander@gmail.com

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Research Methodology

The present study was conducted among members of poultry producer companies functional in Madhya Pradesh and non-member poultry farmers. Multistage sampling was done for data collection. The Madhya Pradesh women poultry producer company was selected because it had completed 5 years of gestation period. A total of 140 members and 140 non-member poultry producers were selected randomly. Propensity score matching was done to eliminate the undue

Table 1: Distribution of member and non-member women farmers according to adoption of technologies of Poultry farming

Statements of Adoption of technologies of poultry farming	Member and Non-member	FA	PA	AR	NA	PR	MADS	Adoption Quotient (%)	χ2
1. Use of improved variety of chicken for egg/meat production	Member	78 (81.25)	15 (15.63)	03(3.13)	00 (0.00)	00 (0.00)	2.78	92.71	140.367***
	Non-member	00 (0.00)	34 (35.41)	15 (15.63)	32 33.33)	15 15.63)	0.86	28.82	
2. Use of Extra calcium for layer birds	Member	00 (0.00)	00 (0.00)	00 (0.00)	96 (100.00)	00 (0.00)	0.00	0.00	192.000***
	Non-member	17 (17.71)	50 (52.08)	19 (19.79)	00 (0.00)	10 10.42)	1.77	59.03	
3.Vaccination against Infectious bursal disease (IBD) and Ranikhet disease (RD)	Member	11 (11.46)	85 (88.54)	00 (0.00)	00 (0.00)	00 (0.00)	2.11	70.49	192.000***
	Non-member	00 (0.00)	00 (0.00)	10 (10.42)	80 (83.33)	06 (6.25)	0.10	3.47	
4. Spraying of flocks with any disinfectant	Member	92 (95.83)	04 (4.17)	00 (0.00)	00 (0.00)	00 (0.00)	2.96	98.61	192.000***
	Non-member	00 (0.00)	00 (0.00)	07 (7.29)	84 (87.50)	05 (5.21)	0.07	2.43	
5.White washing of walls of sheds with good thick coat of lime for prevention of flock from infection	Member	96(100.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	3.00	100.00	192.000***
	Non-member	00 (0.00)	76 (79.17)	05 (5.21)	07 (7.29)	08 (8.33)	1.64	54.51	
6. Proper ventilation in shed	Member	96(100.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	3.00	100.00	192.000***
	Non-member	00 (0.00)	84 (87.50)	07 (7.29)	00 (0.00)	05 (5.21)	1.82	60.76	
7. Application of fumigation on hatchery and poultry shed	Member	92 (95.83)	04 (4.17)	00 (0.00)	00 (0.00)	00 (0.00)	2.96	98.61	186.667***
	Non-member	00 (0.00)	02 (2.08)	08 (8.33)	86 (89.58)	00 (0.00)	0.13	4.17	
8. Disposal of birds during severe infection like bird flu	Member	96 100.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	3.00	100.00	NA
	Non-member	96(100.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	3.00	100.00	
9. Provision of vitamin and mineral mixture to birds to avoid deficiency disease and to boost their immunity	Member	96(100.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	3.00	100.00	192.000***
	Non-member	00 (0.00)	09 (9.38)	10 (10.42)	59 (61.46)	18(18.75)	0.29	9.72	
10. Practice of Bio-security measures	Member	96(100.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	3.00	100.00	192.000***
	Non-member	00 (0.00)	04 (4.17)	08 (8.33)	83 (86.46)	01 (1.04)	0.17	5.56	
11. Cleanliness around Poultry farm	Member	84 (87.50)	12 (12.50)	00 (0.00)	00 (0.00)	00 (0.00)	2.88	95.83	149.333***
	Non-member	00 (0.00)	96 (100.00)	00 (0.00)	00 (0.00)	00 (0.00)	2.00	66.67	
12.Cleaning of walls, floor, litter and ventilation while entry of new birds into farm	Member	96(100.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	3.00	100.00	192.000***
	Non-member	00 (0.00)	73 (76.04)	05 (5.21)	10 (10.42)	08 (8.33)	1.57	52.43	
13. Eggs set for hatching within seven days of collection	Member	00 (0.00)	00 (0.00)	00 (0.00)	96 (100.00)	00 (0.00)	0.00	0.00	192.000***
	Non-member	49 (51.04)	31 (32.29)	11 (11.46)	00 (0.00)	05 (5.21)	2.29	76.39	
14. Provision of chick guards during brooding	Member	96(100.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	3.00	100.00	192.000***
	Non-member	00 (0.00)	96 (100.00)	00 (0.00)	00 (0.00)	00 (0.00)	2.00	66.67	

15.Control of ectoparasite	Member	18 (18.75)	78 (81.25)	00 (0.00)	00 (0.00)	00 (0.00)	2.19	72.92	192.000***
	Non-member	00 (0.00)	00 (0.00)	00 (0.00)	96 (100.00)	00 (0.00)	0.00	0.00	
16. Advise of veterinary doctor for treatment of birds	Member	96(100.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	3.00	100.00	192.000***
	Non-member	00 (0.00)	16 (16.67)	10 (10.42)	61 (63.54)	09 (9.38)	0.44	14.58	
17. Selling egg and meat bird directly to market without involvement of middlemen	Member	36 (37.50)	60 (62.50)	00 (0.00)	00 (0.00)	00 (0.00)	2.38	79.17	51.200***
	Non-member	84 (87.50)	12 (12.50)	00 (0.00)	00 (0.00)	00 (0.00)	2.88	95.83	
18. Postmortem of dead birds by veterinary doctor	Member	00 (0.00)	96 (100.00)	00 (0.00)	00 (0.00)	00 (0.00)	2.00	66.67	180.364***
	Non-member	00 (0.00)	03 (3.13)	04 (4.17)	88 (91.67)	01 (1.04)	0.10	3.47	
19. Segregation of diseased birds	Member	96(100.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	3.00	100.00	192.000***
	Non-member	00 (0.00)	64 (66.67)	00 (0.00)	32 (33.33)	00 (0.00)	1.33	44.44	
20.Provision of feed according to age	Member	96(100.00)	00 (0.00)	00 (0.00)	00 (0.00)	00 (0.00)	3.00	100.00	192.000***
	Non-member	00 (0.00)	14 (14.58)	00 (0.00)	82 (85.42)	00 (0.00)	0.29	9.72	

effect of differences in the socio-economic status of the farmers. Further, 96 members and 96 non-members were found suitable for data analysis.

The adoption of technologies in poultry farming was calculated with the help of an adoption index developed by Chandraker *et al.* (2019). The differential adoption level of poultry farming was measured by using twenty items on a five-point continuum, i.e., fully adopted "FA" = 3, partially adopted "PA" = 2, actively rejected "AR" = 1, not adopted "NA" = 0, and passively rejected "PR" = 0. For every statement, the minimum score was zero and the maximum score was three. The maximum attainable score for any respondent was (20 x 3) = 60, and the minimum was zero. The adoption quotient was calculated as:

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$$\text{Adoption Quotient} = \frac{(3XFA) + (2xPA) + (1xAR) + (0xNA) + (0xPR)}{\text{Maximum Obtainable score}} \times 100$$

Mean Differential Adoption Score was calculated with the formula:

$$\text{Mean Differential Adoption Score (MDAS)} = \frac{(3XFA) + (2xPA) + (1xAR) + (0xNA) + (0xPR)}{\text{Total Number of respondents}}$$

RESULTS AND DISCUSSION

Result in table 1 depicted that mean differential adoption score and adoption quotient for members of the poultry producer company was high for items' use of improved variety of chicken for egg/meat production', 'vaccination against IBD and RD', 'spraying of flocks with any disinfectant', 'white washing of walls of sheds with good thick coat of lime to prevent flock from infection', 'proper ventilation in shed', 'application of fumigation on hatchery and poultry shed', 'disposal of birds during severe infection like bird flu', 'provision of vitamin and mineral mixture to birds to avoid deficiency disease and to boost their immunity', 'practise of biosecurity measures', 'cleanliness around poultry farm', 'cleaning of walls, floor, litter and ventilation while entry of new birds into farm', 'provision of chick guards during brooding, control of ectoparasite', 'advise of veterinary doctor for treatment of birds', 'selling egg and meat bird directly to market without involvement of middlemen', 'post-mortem of dead birds by veterinary doctor', 'segregation of diseased birds', and 'provision of feed according to age' while non-members had high mean differential adoption score and adoption quotient for very few items like 'disposal of birds during severe infection like bird flu', 'cleanliness around poultry farm', 'eggs set for hatching within seven days of collection', 'provision of chick guards during brooding' and 'selling egg and meat bird directly to market without involvement of middlemen'.

Table 2: Distribution of member and non-member women farmers according to different category of adoption of technologies of Poultry farming

Adoption of technologies of poultry farming		Member (N=96)	Non-Member (N=96)
Low (0-24.99)		00 (0.00)	59 (61.46)
Medium (25-48.63)		12 (12.50)	37 (38.54)
High (48.63-53)		84 (87.50)	00 (0.00)
χ^2		155.755***	
Overall Adoption	MDAS	2.51	1.14
	Adoption (%)	83.75	37.92

No members of the poultry producer company belonged to the medium adopter category, while non-members belonged to the medium adopter category for 'use of extra calcium for layer birds', 'white washing of walls of sheds with a good thick coat of lime to prevent the flock from infection', 'proper ventilation in shed, cleaning of walls, floors, litter, and ventilation during the entry of new birds into the farm', and 'segregation of diseased birds' (Table 1).

Members of poultry producer companies belonged to the low adopter category for 'eggs set for hatching within seven days of collection'. However, non-members were low adopters for items like 'use of improved variety of chicken for egg/meat production', 'vaccination against IBD and RD', 'spraying of flocks with any disinfectant', 'application of fumigation on hatchery and poultry shed', 'provision of vitamin and mineral mixture to birds to avoid deficiency disease and boost their immunity', 'practise of bio-security measures', 'advice of veterinary doctor for treatment of birds', 'post-mortem of dead birds by veterinary doctor', and 'provision of feed according to age'. The members of poultry producer company don't practice layer farming; hence not adopt extra calcium feeding to layers and procure chick from the parent company and therefore did not adopt setting of eggs for brooding. The adoption gap in member of poultry producer companies is mainly due to non-adoption of extra calcium feeding for layers and not practicing setting eggs for brooding. The non-members were partially adopting scientific poultry farming for limited activities which were felt essential by the poultry farmers and accessible to them with minimum investment (Table 1). The findings of the present study are in line to the findings of Chandraker *et al.* (2019). Both members and non-members differed significantly at a 0.1% level of significance.

There was high overall adoption rate amongst members of poultry producer companies, while non-members belong to medium adopter category. There was high adoption gap among non-members, which was in the permissible limit amongst members of the poultry producer company. The majority (87.50%) of the member women poultry farmers belonged to high adopter category, followed by medium category (12.5%), while the majority (61.46%) of the non-members belonged to low adoption category, followed by the medium (38.54%) adopter category (Table 2). The member farmers' findings were in line with Semmaran *et al.,* 2008 who reported that adoption was medium to high with significant difference at 1% significance level. Nath *et al.* (2012) and Ithika *et al.* (2013) reported that backyard poultry farmers had low to medium adoption rate, and the results support the present study regarding non-member farmers practicing backyard poultry farming. Singha *et al.* (2016) reported that KVK-adopted villages had medium adoption compared to non-adopted villages, and findings align with the present study.

CONCLUSION

It is concluded that the members of the poultry producers company had higher adoption quotient while non-members had low adoption quotient of scientific poultry farming technologies. Further, members and non-members differed significantly at 0.1% level of significance.

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