IJAS Iranian Journal of Applied Animal Science

Adoption of Scientific Poultry Farming Practices by the Broiler Farmers in Haryana, India

Research Article

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Received on: 17 Nov 2011
Revised on: 18 Feb 2012
Accepted on: 1 Mar 2012
Online Published on: Jun 2013

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Online version is available on: www.ijas.ir

ABSTRACT

The present study was undertaken on 125 broiler farmers randomly selected from five districts, Hisar, Jind, Fatehabad, Sirsa and Bhiwani of Hisar division of Haryana to assess extent of adoption of various scientific practices by the broiler farmers. The package of practices recommended by regional state agricultural university was adopted as the set of scientific practices. The information was collected with the help of a pre-tested structured interview schedule. As a general trend, it was observed that the farmers with smaller flock size are poor adopters of technology. In case of small category farmers, a majority of respondents reported low level of adoption. Of the respondents from medium category, an equal number had adopted low, medium and high level of practice. Almost all of the large category farmers reported a high level of adoption. These results indicate that information seeking behavior of different categories of farmers was totally different based on the size of their enterprises. The larger enterprise possessed better knowledge base and better resourcefulness. Two distinct points emerge from the study: (1) uniform or blanket approach in the organization of poultry extension services is likely to meet only partial success and (2) there is poor information sharing in the peer to peer networks and there are diverse information sources for different categories of farmers. Also, local appropriation of knowledge and technology is an important factor.

KEY WORDS adoption, broiler farmers, health care practices, housing, management.

INTRODUCTION

India ranks fourth in egg production and tenth in broiler output in the world. In terms of poultry (chicken) population, India ranks fifth in the world comprising 2.6 percent of the world's total population.

In 2002, around 37000 million eggs and 1.40 million tons of carcass yields were available resulting in the per capita consumption of 42 eggs and 1600 grams chicken meat in India. Currently, broiler and layer industries in India are estimated to be growing at an annual rate of 12.07 and 9.33 percent, with production of 46.166 and 489.01 million eggs and broilers during the year 2003, respectively (Anonymous, 2006).

In addition, the primary business of poultry farming has given rise to a number of supporting and allied industries like poultry processing, compounded feed, equipments, machinery, pharmaceuticals and etc. With a turnover of more than 100 billion Rs, the industry provides gainful employment to about 3 million people at present which, in itself, is a remarkable feature (Narayankhedkar, 2004). Poultry industry has developed in a highly commercial manner in the past few years. The organized poultry farming is offering increasingly stiff competition to the individual enterprising farmers. In fact, many small and marginal farmers whose livelihood largely depends on poultry farming are finding themselves driven to wall. It is often suggested that these farmers should strive for higher adoption

of the scientific practices to improve production efficiencies. Alive to the problems of such farmers, state run departments are running technology transfer and support programmes. Yet, there exists gap between technology available and its adoption. Various researchers in the past have attempted to study this in different parts of the country (Subramanian and Menon, 1978; Bhattu *et al*. 1999; Singh, 2001; Paul and Sharma, 2005; Semmaran *et al*. 2008). A better understanding of the technology adoption behavior of poultry farmers is desirable. This will help develop better farmer education and support programmes. The present study was conducted in the Haryana state with a view to ascertain the extent of adoption of various scientifically recommended poultry farming practices by the farmers.

MATERIALS AND METHODS

Farms

The present study was conducted on 125 broiler farms of which 21 were small (flock size less than 3000), 78 medium (flock size 3000-16000) and 26 large (flock size above 16000). The farms were randomly selected from five districts of Hisar division of Haryana state namely, Hisar, Jind, Fatehabad, Sirsa and Bhiwani. The data was collected by holding personal interview with the broiler farmers using a structured interview schedule developed for this purpose during 2009-2010.

Scientific practices

A set of scientific practices was defined based on the recommendations of the regional agricultural university. The recommendations were in the form of a package containing all the required information on the broiler enterprise. To assess the adoption of practices, questions from the recommended package were selected in consultation with poultry experts.

Scoring of questions

Each question was given a score ranging from 0-3 (0 for non-adoption, 1and 2 for partial adoption and 3 for full adoption). The overall adoption score for each respondent was then calculated by summing up all the scores obtained for each individual item. Respondents were then grouped into three categories viz., low, medium and high level of adoption using mean and half standard deviation formula. Mean and mean percent score were also worked out for individual questions.

RESULTS AND DISCUSSION

Extent of adoption of scientific poultry production technologies

The data summarized in Table 1 reveals that in case of small category farmers, a majority of respondents possessed low level of adoption in all four major areas of scientific broiler farming practices. Among the respondents from medium category, more or less equal numbers of farmers were having low, medium and high level of adoption. Contrarily, in case of large category of farmers, none of the respondents had low level of adoption and almost all the respondents enjoyed higher adoption. Cause and effect dilemma aside, the results indicate that the larger enterprises require a better knowledge base and resourcefulness leading to greater adoption. However, it will be worthwhile to explore whether it was better knowledge that facilitated the enterprise or it was other way round farmers entering into large enterprise were compelled to acquire knowledge once they entered the enterprise. Such an understanding can go a long way in designing better extension and strategic support programmes.

On the whole, 38.4 percent of the total respondents were found to have high level of adoption, while 32 percent of them were content with low level. The remaining 29.6 percent fell in the medium level of adoption. As stated earlier, the scientific broiler farming practices were divided into four broad areas namely, housing, management, feeding and health care practices. Results are outlined accordingly.

Housing practices

Extent of adoption of scientific practices was varying across different farmer categories. Data presented in Table 1 reveals that a majority of small farmers had medium level of adoption. Contrary to the expectations, none of the respondent of this category was having low level of adoption, as far as the broiler farmers with medium sized flock were concerned, a sizeable majority had medium level of adoption. Similar to the small farmers, a majority of respondents from large category had medium level of adoption followed by high level. None of the respondents of large category had low level of adoption.

On the whole, it is apparent that nearly three-fourth of respondents possessed medium level of adoption. Item-wise analysis was performed to explore the reasons for the results obtained.

Item-wise analysis

All the respondents fully adopted proper ventilation in the shed followed by required space to each bird as evident by their mean percent score (Table 2). The high rate of adoption of these practices may be due to the fact that the idea has very well percolated in the farmer's knowledge domain. Sharnappa and Veeranna (1999) have earlier observed medium adoption in case of providing adequate floor space to the birds. On the other hand, poor adoption was seen in case of provide roofs according to season and consult veterinarians / scientists for construction of shed. It may be possible

that farmers do not realize the benefits of providing good roofing in different seasons. The non-adoption of providing roofs according to season may be due to non-feasibility of the practices and the availability of other alternative cooling or heating arrangements. In any case, this fact should be taken into consideration in future extension programmes. Further, it should be explored as to why farmers pay greater attention to some of the things like making proper provision for ventilation but pay less of attention to other things like providing good roofing. It appears that every individual recommendation or technology gets appropriated before being adopted or rejected. Probably, the innovators or early adopters play a critical role in reinventing or appropriating the technology or knowledge.

Management practices

A majority of small category farmers had low level of adoption of management practices (Table 1). On the other hand, more or less equal number of respondents was observed to have low, medium and high level of adoption in case of respondents of medium category. Whereas, in case of large category of farmers, a small percentage exhibited medium level of adoption, while a large majority of them had high adoption level. Astonishingly, none of the respondents in the large farmers' category had low level of adoption. It appears that the farmers of large category had better knowledge and were resourceful enough to adopt the scientific practices. Analysis of individual items further revealed the underlying phenomenon.

Item-wise analysis

It was observed that there was full adoption of the some practices namely, provide adequate feed and water, provide heating and cooling facilities and use of feeder and waterer (Table 3). The full adoption may have resulted not only from their knowledge about these, but a conviction about the importance of these practices. In line with the present study, Paul and Sharma (2005) observed high adoption of providing proper feed and water to birds. Poor adoption was seen for the practices namely; daily rack the litter in deep litter system, weigh day old chicks on arrival and use of footbath. This may be due to lack of knowledge or sheer ignorance about the importance of these practices.

However, Sharnappa and Veeranna (1999) observed full adoption with respect to litter management while Safalaoh *et al.* (1998) and Rahman *et al.* (2002) reported

Table 1 Adoption level of broiler farmers about scientific poultry production technology

Aspect	Mean and SD	Category	Flock size							
			Small		Medium		Large		Overall	
			Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Housing	Mean= 8.22 SD= 0.53	Low (7-8)	0	0.00	5	6.41	0	0.00	5	4.0
		Medium (9)	17	80.95	54	69.23	18	69.23	89	71.2
		High (10)	4	19.04	19	24.35	8	30.76	31	24.8
Management	Mean= 37.71 SD= 2.33	Low (33-36)	15	71.42	23	29.48	0	0.00	39	31.2
		Medium (37-38)	5	23.80	31	39.74	3	11.53	39	31.2
		High (39-44)	1	4.76	24	30.76	23	88.46	47	37.6
Feeding	Mean= 18.72 SD= 2.78	Low (13-17)	14	66.66	27	34.61	0	0.00	41	32.8
		Medium (18-19)	4	19.04	24	30.76	2	7.69	30	24.0
		High (20-23)	3	14.28	27	34.61	24	92.30	54	43.2
Health	Mean= 29.36 SD= 2.73	Low (21-28)	18	85.71	26	33.33	0	0.00	45	36.0
		Medium (29-30)	2	9.52	28	35.89	3	11.53	33	26.4
		High (31-33)	1	4.76	24	30.76	23	88.46	47	37.6
Overall	Mean= 94.02 SD= 7.38	Low (75-90)	15	71.42	24	30.76	0	0.00	40	32.0
		Medium (91-97)	5	23.80	31	39.74	1	3.84	37	29.6
		High (98-106)	1	4.76	23	29.48	25	96.15	48	38.4

Table 2 Item-wise adoption of housing practices among broiler farmers

Items	Flock size											
	Small			Medium			Large			Overall		
	MS	MPS	Rank	MS	MPS	Rank	MS	MPS	Rank	MS	MPS	Rank
Consult veterinarians / scientists for construction of shed	1.19	39.68	II	1.26	42.30	III	1.30	43.58	II	1.26	42.13	III
Provide required space to each bird	3.00	100.00	I	2.93	97.86	II	3.00	100.00	I	296	98.66	II
Provide proper ventilation in the shed	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I
Provide roofs according to season	1.00	33.33	III	1.00	33.33	IV	1.00	33.33	III	1.00	33.33	IV

Table 3 Item-wise adoption of management practices among broiler farmers

Items	Flock size											
	Small			Medium			Large			Overal		
	MS	MSP	Rank	MS	MSP	Rank	MS	MSP	Rank	MS	MSP	Rank
Clean and disinfect shed	2.14	71.42	V	2.80	93.58	VI	3.00	100.00	I	2.73	91.20	VI
Keep records at the farm	2.09	69.84	VI	2.51	83.76	VIII	2.96	98.71	II	2.53	84.53	VIII
Practice deep litter system	2.57	85.71	IV	2.65	88.46	VII	2.76	92.30	IV	2.66	88.80	VII
Practice all in all out system of rearing	2.95	98.41	II	2.96	98.71	III	2.96	98.71	II	2.96	98.66	IV
Provide adequate feed and water	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I
Provide heating and cooling facilities	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I
Use of footbath	1.57	52.38	VIII	2.06	68.80	IX	2.76	92.30	IV	2.12	70.93	IX
Weigh day old chicks on arrival	1.71	57.14	VII	1.83	61.11	X	2.53	84.61	V	1.96	65.33	X
Visit birds / shed frequently in a day	2.80	93.65	III	2.85	95.29	V	2.92	97.43	III	2.86	95.46	V
Use of feeder	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I
Use of waterer	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I
Daily rack the litter in deep litter system	1.47	49.20	IX	1.82	60.68	XI	2.19	73.07	VI	1.84	61.33	XI
Check the temperature of the shed	3.00	100.00	I	2.97	99.14	II	2.96	98.71	II	2.97	99.20	II
Market birds at 6-8 weeks of age	3.00	100.00	I	2.94	98.29	IV	3.00	100.00	I	2.96	98.93	III

higher adoption of deep litter system. On the other hand, Paul and Sharma (2005) observed low mean percent score about racking of deep litter. It appears that the knowledge and practices have a regional dimension. It again raises a question as to why certain things get due attention somewhere whereas the same thing is neglected elsewhere. Although it is quite possible that varying regional agro-climatic conditions, endemic diseases, etc may have affected the adoption of practices like racking deep litter daily. Yet, it should not be ruled out that differential appropriation of knowledge may have contributed to the difference.

Feeding practices

The data summarized in Table 1 indicates that a majority of respondents of small category had medium level of adoption. In case of respondents from medium category, almost equal percentages of respondents were found to have low, medium and high level of adoption. Conversely, a majority of respondents from the large category had high level of adoption. None of the respondents had low level of adoption. The pooled analysis of feeding practices revealed that a simple majority possessed high level of adoption followed by low and medium level of adoption.

Item-wise analysis

Overall, most of the broiler farmers were providing bala anced / ready made feeds, providing feed according to age and providing mineral mixture as per scientific recommendation (Table 4). Higher adoption of practices was seen in case of balanced / ready made feeds. Availability and ease in feeding diverse feeds may have led to the higher adoption. These are in line with the findings of Khan (1973), Subramanian (1978), Safalaoh *et al.* (1998) and Sharnappa and Veeranna (1999) who observed high adoption of feeding balanced / ready-made feed by poultry farmers. Safalaoh *et al.* (1998), observed high adoption of feeding birds according to age while Rahman *et al.* (2002) and Paul and Sharma (2005) observed medium adoption of feeding according to age and balanced / ready made feed for feeding.

Poor adoption was seen in case of providing crumbs / pellet feed, water testing, buying feeds weekly and etc. The poor adoption of providing crumbs / pellet feed may be attributed to non-availability of such feeds. Similarly, a majority of farmers were not getting water tested perhaps because of lack of facilities. Simple dynamics of purchasing in bulk to reduce the transaction cost may have contributed to the majority not buying feeds weekly.

Health care practices

It is evident from the Table 1 that in case of health care practices, a majority of small farmers had low level of adoption. This makes their enterprise very risky. It is quite possible that the small farmers consider it worth to take a risk given their flock sizes. Nevertheless, possibility that getting healthcare coverage is costly should not be ruled out. In case of medium category of farmers, there was almost equal distribution of respondents in all the three levels of adoption. Among the large category of farmers, majority of the respondents had high level of adoption of health care practices. Again, none of the respondents from large farmers' category reported low level of adoption. Although the state Govt provides health care facilities at nominal cost to all the farmers, yet there are significant differences in the level of adoption. Outreach and efficiency of state owned health care facilities may be varying given the fact that the large farmers are able to adopt a significant number of health care practices. It appears that the private health care service providers are playing a significant role.

Table 4 Item-wise adoption of feeding practices among broiler farmers

Item	Flock size											
	Small			Medium			Large			Overal		
	MS	MPS	Rank	MS	MPS	Rank	MS	MPS	Rank	MS	MPS	Rank
Buy feeds weekly	1.76	58.73	V	1.97	65.81	V	2.76	92.30	IV	2.10	70.13	VI
Store feeds on wooden logs / racks	2.19	73.01	IV	2.19	73.07	III	2.92	97.43	II	2.34	78.13	IV
Provide balanced / readymade feeds	3.00	100.00	I	2.97	99.14	I	3.00	100.00	I	2.98	99.46	I
Provide crumbs / pellet feed	1.19	39.68	VII	1.35	45.29	VII	2.38	79.48	V	1.54	51.46	VIII
Provide feed according to age	2.90	96.82	III	2.94	98.29	II	3.00	100.00	I	2.95	98.40	II
Provide mineral mixture	2.95	98.41	II	2.94	98.29	II	2.88	96.15	III	2.93	97.86	III
Get your water tested	1.42	47.61	VI	1.71	57.26	VI	2.23	74.35	VI	1.77	59.20	VII
Calculate FCR[1] at the time of marketing	1.42	47.61	VI	2.17	72.64	IV	2.88	96.15	III	2.20	73.33	V

[1] FCR: feed conversion ratio.

Table 5 Item-wise adoption of health care practices among broiler farmers

Items	Flock size											
	Small			Medium			Large			Overal		
	MS	MPS	Rank	MS	MPS	Rank	MS	MPS	Rank	MS	MPS	Rank
Use of antibiotics in early age of birds	2.85	95.23	II	2.84	94.87	IV	3.00	100.00	I	2.88	96.00	V
Timely treatment of sick birds	2.42	80.95	IV	2.60	86.75	VI	2.88	96.15	IV	2.63	97.73	IV
Segregation of diseased birds	2.00	66.66	VI	2.37	79.05	X	2.84	94.87	V	2.40	80.26	X
Vaccination against Newcastle disease	2.00	66.66	VI	2.17	72.64	XI	2.80	93.58	VI	2.28	76.00	XI
Vaccination against IBD[1]	3.00	100.00	I	2.93	97.86	III	2.96	98.71	II	2.95	98.40	III
Proper disposing of dead birds	1.90	63.49	VII	2.43	81.19	IX	2.80	93.58	VI	2.42	80.80	IX
Disinfection of premises	1.85	61.90	VIII	2.47	82.47	VIII	2.92	97.43	III	2.46	82.13	VIII
Protection of birds against cold and hot	3.00	100.00	I	2.98	99.57	II	3.00	100.00	I	2.99	99.73	II
Keeping the litter dry	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I	3.00	100.00	I
Sending of dead birds for postmortem	2.57	85.71	III	2.78	92.73	V	2.88	96.15	IV	2.76	92.26	VI
Restrict the movement of man and animal	2.23	74.60	V	2.55	85.04	VII	3.00	100.00	I	2.59	86.40	VII

[1] IBD: infectious bursal disease.

Possibility of the state owned services being biased in favour of large farmers can not be ruled out as is generally the case.

Item-wise analysis

In case of adoption of health care practices by all the respondents, higher adoption was observed for keeping the have earlier been reported (Khan, 1973; Subramanian, 1978; Sharnappa and Veeranna, 1999; Paul and Sharma, 2005; Semmaran *et al*. 2008; Lawal *et al*. 2009). However, Paul and Sharma, (2005) observed low adoption of sending dead birds for postmortem by broiler farmers in their study. This may have been due to poor availability of such facilities in the study area. Poor adoption was seen for vaccination against Newcastle disease, segregation of diseased birds, proper disposal of dead birds, disinfection of premises and biosecurity, as evident by their mean adoption score. There is therefore a need to focus on these areas in future extension programmes. Better farmer education should be aimed for higher adoption. Local appropriation of knowledge and technology is a significant factor in the study area.

Therefore, inclusion of innovators and opinion leaders in extension efforts is likely to significantly favour the communication and adoption of ideas.

Other noteworthy trend in the article is that the information sharing and imitation is varying across different categories of farmers. Therefore, it is only logical to suggest that there is a need to target all the three categories of farmers differently in any future extension programme.

CONCLUSION

On the basis of foregoing results it may be concluded that the information sharing and imitation is poles apart in different categories of farmers. It appears that there are diverse information sources for different categories of farmers. It is suggested that further studies to understand information seeking behavior of different categories of farmers should be attempted. Any future farmer education programme should take into consideration the differential information seeking behavior of different categories of farmers. Further, it was observed that the farmers with small flock size are poor adopters of technology.

Although the reasons may be varied, but there is no denying the fact that better support programmes are required for such farmers. Moreover, uniform or blanket approach in the organization of poultry extension services is likely to meet only partial success. Finally, local appropriation of knowledge and technology appears to have a crucial role in the process of technology adoption. Better understanding of the process of appropriation should pave way for much more effective farmer support programmes.

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