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Impact of Training and Monitoring of Drug Used by Small Scale Poultry Farmers at Different Location of Bangladesh

Razia Khatun[1], Md. Abdul Jabbar Howlader[2], Shamim Ahmed[1], Md. Nazrul Islam[1], Md. Amirul Hasan[1, *], Md. Shariar Haider[3], Mohammad Showkat Mahmud[1]

[1]Bangladesh Livestock Research Institute, Savar, Dhaka, Bangladesh
[2]Department of Zoology, Jahangirnagar University, Savar, Dhaka, Bangladesh
[3]Palli Karma Sahayak Foundation (PKSF), Dhaka, Bangladesh

Abstract

Quality and safe food commodities play an important role, whether it is domestically produced or imported for consumption. So, ensuring safe food is a prime requisite for keeping good human health or enhances the quality of life. The aim of the study was to build up awareness about excessive drug use or malpractice during poultry production and its hazard on human health. Considering this situation, a sorts of subjective training programme was arranged for small scale poultry farmers. After training, farmers were monitored and supervised continuously with a view to ensure proper doses of drug use at farm condition. Keeping this mind a survey was accomplished targeting 100 trained and 100 non-trained farmers at Joypurhat and Bogra districts of Bangladesh. The objective of this study was to identify the cause of abrupt use of different group of drugs, additives, and dose of administration practiced by the commercial farmers and also to assess training impact on profitable of poultry farming. Data were collected during 2009 to 2010 for selected trained and non-trained farmer focusing before and after disease outbreak. The findings of this study revealed that training and monitoring can play a vital role to change the existing malpractice of drug and additives towards increase the profitability among the farmers who have no practical knowledge about proper dose and appropriate drug use for the betterment of small scale poultry farms.

Keywords

Training Impact, Drug use, Small Scale Poultry Farmers, Bangladesh

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1. Introduction

Drugs are used to treat disease infested animals/birds and promotion of growth, but remaining of drugs found in finished products (meat, egg and milk) is called as drug residue. The total production of steroids, antibiotics and other growth promoter are 0.64, 2.64, and 1.2 tons in Bangladesh respectively. About 6.3 tons of antibiotics, 22 tons of enzymes and 40 tons of other feed additives are imported annually in Bangladesh (Turkson, 2008). The use of antimicrobial agents in food-producing animals has recently become a very important public health hazard issue (Jafari et al. 2007). Although the extent of antibiotic use in animals in Bangladesh is unknown, but we assume that improper dosages/discontinued course of treatment with antibiotic and residue of drug from animal and poultry origin play a vital role for the development antimicrobial drug resistance can only decrease their amounts after cooking processes (Javadi et al. 2011). Antibiotics are

* Corresponding author
E-mail address: rkbaby96@yahoo.com (R. Khatun), jabbarjuib@gmail.com (Md. A. Jabbar), sahmed_blri@yahoo.com (S. Ahmed), dgblri56@yahoo.com (Md.N. Islam), amirul.blri@gmail.com (Md. A. Hasan), shahriarhaider@pksf-bd.org (Md. S. Haider), msmvet@yahoo.com (M. S. Mahmud)

widely used in developing countries due to high incidence of infectious diseases (Al-Mufarrej, 2013; Andrew and Seibersdorf, 2012 and Mitema et al. 2001). The improper use of drugs/feed additive in the poultry industry resulting chemical residues in poultry and poultry products making a threat for public health concern. Such situation is equally dangerous for birds and also for human (Bradly and Katz, 1988; Mourot and Loussourorn, 1981 and Singh, 2003). The small scale poultry farmers who shared the maximum commercial market of the country have little knowledge about farm management and proper dose of drug use. In a profitable farming system when business is going on without any interruption, no faces pandemic diseases, making a check-list for the employee to update their knowledge towards successful running business through a subject related training. Implementation bio-security program at farm level incurs little cost compared to disease preventive measure. So Bio-security is an important approach making a difference between success and failure story in a poultry operation. It is well known to all that a bio-security package program is essential for any poultry farmers to survive with profitable their business. The guidance of proposed bio security having two principles one for proper and judicious use of antibiotics in food-producing animals and other for medicines should be used with consultation of a registered veterinarian practitioners. These practices will be implemented properly when appropriate training and monitoring is properly applied to the farmers. Monitoring helps to limit antimicrobials used in animal production in a few countries subsequently it covers most of countries. So awareness build up within countries reduces adverse effects of antimicrobial drugs in farm practices ranges minor to negligible. Most of countries have identified various constraints such as lack of legislation, lack of knowledge, lack of resources and lack of veterinary services that hindered to the prudent drug use. The degree of awareness varied and in some countries cases found as minimal. Moritz 2001 reported that awareness within 15 out of 18 OIE Member countries in Africa, where monitoring of the quantities of antimicrobial used in animal production is limited except only a few countries. It should be mentioned that education and training initiatives towards antibiotics users in all spheres of animal husbandry perspectives. For effective poultry production, farmers need to be exposed a good and modern training following appropriate use of drugs during and after disease outbreak on their farms. It is well documented that a positive and significant association between the respondent's farm size and training needs. So, farmers adopt new knowledge of poultry rearing more easily if they trained in their own environment through participatory based learning (Arowolo et al. 2012 and Riise et al. 2010). Most of the farmers used antibiotics for treatment and control of specific ailments, prophylaxis, for combating stress, and enhancing egg production. It is clear from the different available international literature express that improper antibiotics use in animal production in a long run effect resistance established against to antimicrobial drugs in humans and animals making an emerging problem. Traditionally strategies of food safety training programme promote strict hygienic management practices in all aspects from raw to final product in food value chain. However, a very few studies have been conducted to evaluate the impact of food safety training on food handlers attitudes irrespective of good hand hygiene practices (Soon et al. 2012). In most cases, farmers used different chemical drugs and feed additives as preventive and curative measure against diseases following the suggestions of local prescriber or representative of medicine companies. Most of the farmers did not follow proper dose of drug/feed additive and not consider its withdrawal period, making hazardous situation for consumer of poultry products. The use of inappropriate additives and the drug also increases the cost of poultry production at a small-scale farmer level. To get better farm profitability, the poultry farmers need to be identified the threats of disease entrance route of their farm, cost of disease and their prevention and lastly bio-security risk present in the farm premises area. In connection with this another study observed that farmers are practicing heterogeneous and traditional methods in poultry and poultry product management resulting high concentrations of different broad-spectrum antibiotics found in marketed poultry (Khatun et al. 2011). These are not safe for human health. Considering the present situation of drug abuse and the paucity of information on this matter the present studies were conducted.

2. Materials and Methods

2.1. Training Programme

A training programme at two different locations among 100 farmers were arranged covering, way to keep hygienically operating poultry and poultry products; benefits of proper uses of drugs and additives; disadvantage of excessive drug in poultry and ultimate adverse effects of indiscriminate drug use on human health. After imparting the training programme, keep monitoring and technical services strengthened of the trained farmers and to assess the impact of selected areas poultry farmers following in the next year.

2.2. Survey Programme

Location and target group

The target group of this survey was small and medium scale commercial poultry farmers in Joypurhat and Bogra Districts of Bangladesh.

Sample size

Even number (50) of farmers was selected from each group (trained and non trained group) for each location.

Survey method

Face to face interview method was applied following pre-tested well-structured questionnaire for this survey. Any answer if not enlisted or taken into consideration as per questionnaire requisite, during the time of rechecking the investigator went to the farm area and collect the data for minimizing the error.

2.3. Statistical Analysis

Simple descriptive statistics (frequencies, means etc.) were used for profitability measurement and complex analyses (Z-test).

3. Results and Discussion

3.1. Before Disease Outbreak Condition

Before disease outbreak at farm premises, use ofexcessive drugs is unethical and believed the major source ofdrug residues in poultry. From the survey of selected research area i.e. Joypurhat and Bogra Districts, it was observed that 100 and 90% of the non trained farmers were involved in unnecessary antibiotics practicebefore disease outbreak, whereas 92 and 76% of the trained farmers of the respective locations did not follow this practice (Figure 1). This findings was in agreement of Akteruzzaman et al. 2009 thatthe quality and quantity of food intake of the farmers with training exposures was found to be changed positively in comparison with those having no training intervention. Lack of knowledge/training cannot provide stakeholders any information on the benefits of prudent antimicrobial use and the risk associated with inappropriate use (Moritz, 2001).

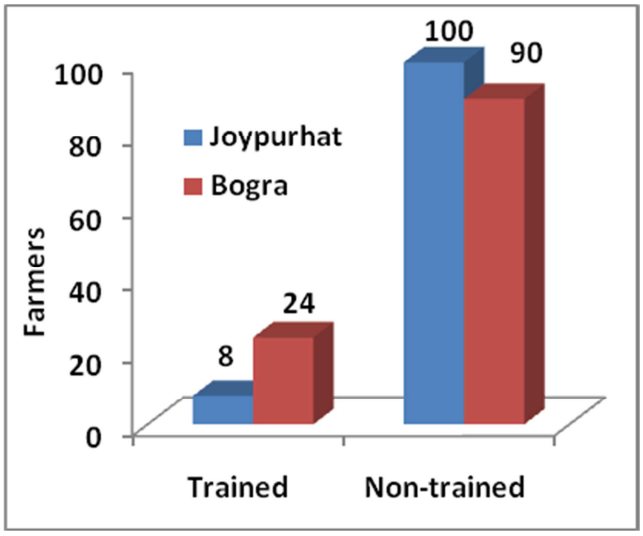
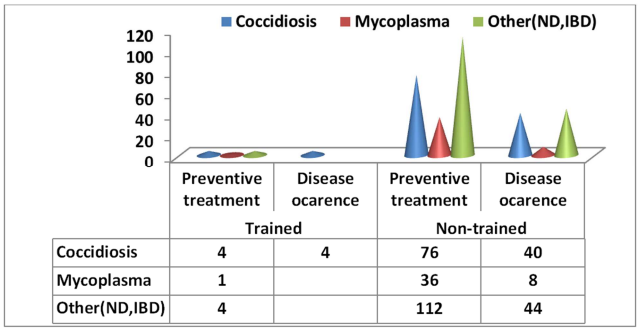


Figure 1. Drug use before disease outbreak (% farmers).

It was observed that 50 non-trained farmer of Joypurhat and Bogra applied 224 and 193 more timesas cumulative of preventive medicine in one batch with a range of one to six times respectively (Table 1). Out of 224 and 193 times farmers applied 76; 36; 112 and 61; 67; 65 times for preventing coccidiosis, mycoplasma and other disease like ND and IBD in Joypurhat and Bogra districts respectively (Figure 2 and Figure 3), which was related mostly similar with the findings of Singh et al. 2003. Who reported that drug used by respondents could broadly be classified as antibacterial (52.0%, n=1559), coccidiostate or coccidicidals (33.7%) and de-wormers (14.3%) in Ghana.

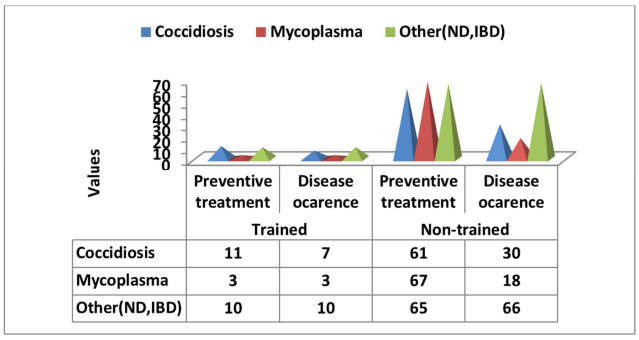
Table 1. Preventive treatment and their frequency of practice by farmers of two locations.

Parameter		Joypurhat						Bogra					
		Trained farmers (50)			Non-trained framers (50)			Trained farmers (50)			Non-trained framers (50)		
		No.	Cum.Fre.	%	No.	Cum.Fre.	%	No.	Cum.Fre.	%	No.	Cum.Fre.	%
a) Preventive treatment		4		8	50		100	14		28	45		90
b) Frequency of preventive treatment in one batch													
I.	Once	1	1	2	0	0	0	9	9	18	4	4	8
II.	Twice	2	4	4	6	12	12	2	4	4	2	4	4
III.	Thrice	0	0	0	5	15	10	1	3	2	8	24	16
IV.	Four time	1	4	2	16	64	32	2	8	4	7	28	14
V.	Five time	0	0	0	5	25	10	0	0	0	17	85	34
VI.	Six time	0	0	0	18	108	36	0	0	0	1	6	2
VII.	Seven time	0	0	0	0	0	0	0	0	0	6	42	12
Total		4	9	-	50	224	-	14	24	28	45	193	-



	Trained		Non-trained	
	Preventive treatment	Disease ocarence	Preventive treatment	Disease ocarence
Coccidiosis	4	4	76	40
Mycoplasma	1		36	8
Other(ND,IBD)	4		112	44

Figure 2. Occurrence of disease after preventive treatment in Joypurhat.



	Trained		Non-trained	
	Preventive treatment	Disease ocarence	Preventive treatment	Disease ocarence
Coccidiosis	11	7	61	30
Mycoplasma	3	3	67	18
Other(ND,IBD)	10	10	65	66

Figure 3. Occurrence of disease after preventive treatment in Bogra.

Most of the farmers think about to prevent their farm from different bacterial, viral or parasitic diseases making their farm profitably. Keeping this in mind they use repeatedly different group medicine, vitamin or mineral supplement. They don't think either their bird needs medicine or vitamin or birds are diseased or health condition. The ideas which influenced the farmer to administer medicine before disease breakout were 102; 68; 54; 0 and 56; 63; 25; 49 cases comes from drug seller, drug marketing officer, neighbouring farmer and farmer himself out of 224 and 119 times respectively (Figure 4). Though the preventive treatment is much intense, but the occurrences were found much higher for non-trained farmers that implies, treatments were mostly unnecessary and inventive to illness.

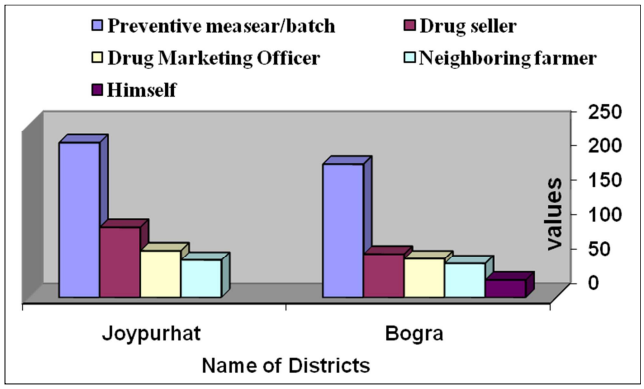


Figure 4. Pattern of medicine use before disease outbreak of non-trained farmers.

The drug used for preventive treatment in Joypurhat and Bogra Districts are shown in Table 2. In Joypurhat district sulfonamide group (88), quinolone group (80, mostly ciprofloxacin - 30 and enrofloxacin - 22) and microlide group (45) were observed. The chronological position of mentioned drug group was same except the frequency in Bogra District i.e. sulfonamide group (79), quinolone group (73, mostly ciprofloxacin - 54) and microlide group (43). The individual antibiotic usage was also higher in non-trained farmer than trained farmers in both locations. This findings fully supported by Riviere and Spoo, 1995 who reported that all poultry farmers frequently use different antimicrobial agents interchangeably for treatment and control of diseases. Because of frequent occurrences of different diseases in the farms and lack of proper veterinary extension services, excessive motivation of marketing officers from different veterinary products company influential impose to prove farmers indiscriminate use of antibiotics of which may associate with improper dosing and lack of advice on withdrawal period. Farmers are not concerned the long term effects of using excessive drugs their farm. In this connection, Muhammad, 2010 reported high level of self medication rates observed amongst farmers procuring amongst farms particularly with enrofloxacin and gentamycin. Medication without consultation with qualified veterinarians may result in the abuse and misuse of antibiotics with the attendant tends to resistance establishment and the occurrence of drug residues in poultry and poultry products.

3.2. After Disease Outbreak Condition

When farmers are reluctant to manage their farms, especially for supplying quality feed, timely vaccine administration, bio security management all this facts relate to escape for disease infestation so far. This happens lack of knowledge on good farming practices. The scenario of technical service provider in Joypurhat and Bogra Districts are shown in (Figure 5 and Fig. 6). After disease outbreak, 88% and 68% trained farmer of Joypurhat and Bogra received technical service from technical service provider i.e. 68; 14; 6% and 58; 6; 4% from scientific officer, Veterinary Surgeon (VS) and private veterinarian and non-trained framer of above mentioned locations, The scenario was quite opposite i.e. 52; 10; 10; 28% and 62; 12; 20; 6% from marketing officer, farmer itself, from private veterinarian and VS respectively. This result supported by Moritz, 2001 who stated there are users of antibiotics in 11 of the 18 countries that are familiar with withdrawal periods. They went to listed veterinarian, extension officers and product package inserts as the source of information relating to withdrawal times.

About 90% trained farmer of Joypurhat used drugs at proper dose during treatment period against 74% in Bogra. In case of additives use, 84% and 68% trained farmer followed the appropriate dose whereas 82% and 86% non-trained farmer involved in the improper use of additives of Joypurhat and Bogra respectively (Table 2). The reasons behind this difference between this two groups answered by the non-trained groups were i) long distance of livestock office, ii) fear of Avian Influenza diagnosis, iii) marketing officers iv) need not to pay money, v) credit facilities.

A total 90% trained farmers of Joypurhat were in practice of use of drug at proper dose during treatment period whereas 74% stood for proper practice in Bogra. The improper practice in case of dose was found mostly in non-trained farmers of Joypurhat and Bogra as 76% and 82% (Table 2).

Findings of this study relates the Moritz, 2001 statement that lack of resources that impact negatively on efforts to develop surveillance and monitoring programmes, education strategies, evaluation and licensing of antimicrobials and efforts to combat the distribution and use of illegal and counterfeit products.

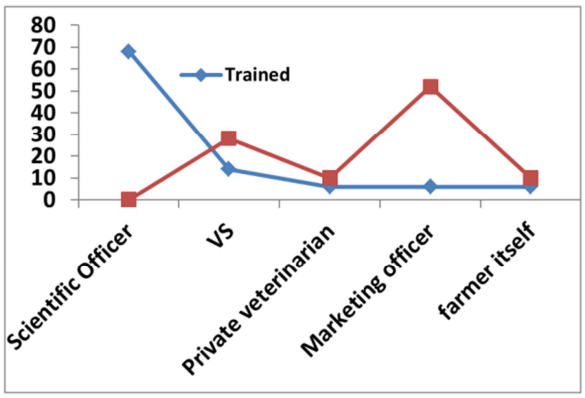


Figure 5. Scenario of technical service provider in Joypurhat.

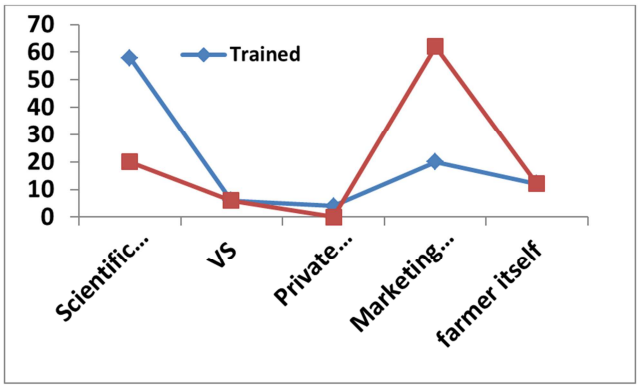


Figure 6. Scenario of technical service provider in Bogra.

Table 2. Drug and Additives use by farmers of two locations.

Parameter	Joypurhat		Bogra	
	Trained farmers (50)	Non-trained framers (50)	Trained farmers (50)	Non-trained framers (50)
1.0 After disease outbreak condition				
a) Followed appropriate drug dose (%) at drugs using time (%)	90	24	74	18
b) Followed withdrawal period at drug using time (%)	86	16	56	18
c) Followed appropriate additives dose at additives using time (%)	84	18	68	14
2.0 Before disease outbreak condition				
d) Drug used for preventive measure (No.):				
Sulfonamide group	88	2	79	2
Quinolone group	80	2	73	4
Ciprofloxacin	30	2	45	2
Enrofloxacin	22		11	
Microlide group	45		43	
Penicillin	21		2	
Tetracycline	36		29	
Norfloxacin	2		2	

3.3. Withdrawal Period

Farmers always think about their birds keep healthy and remain productive condition for long time. For this intentionally none of the farmers followed the drug withdrawal period, except 86% and 56% of the trained farmers found maintain the drug withdrawal period in Joypurhat and Bogra districts respectively. This was probably due to avoidance of preventive treatment and disease outbreak pattern among the trained farmers. The situation was quite different in case of non-trained farmers i.e. 84% and 82% in Joypurhat and Bogra districts (Table 2). Awareness can play a vital role following the principles of withdraw period of drugs, uses in poultry and poultry

products at consumers level. Awareness within 15 of 18 OIE member countries in Africa, users of antibiotics in 11 out of 18 countries that are familiar with withdrawal periods because they went on to listed veterinarians, extension officers and product package inserts as the source of information relating to withdrawal times (Moritz, 2001).

3.4. Use of Additives

Additives are important issues for sustaining profitable production. The feature of additives used in Joypurhat and Bogra districts are shown in Table 2. In case of 84% trained farmers of Joypurhat followed the appropriate dose whereas the percentage was 68 in Bogra. 82% non-trained farmers of Joypurhat involved in the improper use of additives and the percentage was 86 for the farmer of Bogra Districts.

3.5. Profitability

Running profitable business need to minimize the variable cost without disturbing poultry. Vaccination and additive is regarded as vital factors to incur production cost as well as production enhancer. When surveyed the studied area found average vaccination, additives and medicine price per bird mostly varies between Tk 2-5. In the year 2009, per unit average cost for vaccine, additives and medicine was around Tk 11, which was reduced to Tk 3 and 6 during disease free condition and diseased condition in case of trained farmers of Joypurhat Districts in 2011. The reduced rate for trained farmers of Mokamtola District was Tk 4.5 and 9 in 2010. The deviated amount obtained from increased profit per chicken (Figure 7). Per unit average cost for vaccine, additives and medicine was significantly higher ($P<0.01$) than the standard in 2009 and 2010 (disease free condition and diseased condition) in Joypurhat.

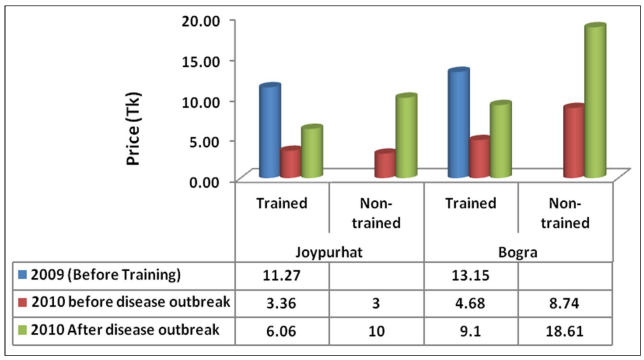


Figure 7. Cost of vaccine, additive medicine per chick at two locations.

The scenario was same i.e significantly higher ($P<0.01$) than in 2009 and 2010 considering the above mention situation in Mokamtola (Bogra). The cost of disease prevention and control implies that most investment should be emphasized for training and education purposes that make yourself and your employees about risk reduction behaviour and changing procedure at farm level for getting better profit (Singh et al. 2003) reported that training, vaccination camp and regular medication generated faith in the farmers to rear the chicken in a profitable way. The lack of rules and regulations with regards to antimicrobial residue in food in Bangladesh is far behind compare to developed countries. To strengthening this sector need to be updated rules and regulation and strict monitored for execution at farm level. To do this needs urgent extension and education programmee though training covering the use and misuse of antibiotics in poultry and public health residues impact at public sectors, including farmers, manufacturers, distributors, importers and other stake holders. Consumers must be informed that they can reject any products which caused harm their health. A campaign must be initiated to educate the farmers about the withdrawal period of drugs as well as the ill-effects of drug residues on human health. Lessoned from the human sector like recognition of problems through surveillance, education, regarding the consequence of inappropriate use, greater control of antibiotic of antimicrobial use guideline for best practices could be applied to the animal/poultry field.

4. Conclusion

Unethical use of the drug is regarded as the major source of drug residues in poultry and poultry products before disease outbreak in poultry farms. From the survey findings, it revealed that 90-100% of the non trained farmers and 8-24% of the trained farmers involved in malpractice drug use of the respective locations. The cost involved, especially for feed additives and medicine per unit was found significantly higher ($P<0.01$) than the standard in 2009 and 2010 (disease free condition and diseased condition) in Joypurhat. For the drug withdrawal period following cases, i.e. 86% and 56% of the total trained farmers found in Joypurhat and Bogra districts. The situation was quite different in case of non-trained farmers in Joypurhat about 84%and 82% in Bogra districts, respectively. The lack of awareness may be one of the important factors for minimizing misuse of drug in farm condition so far. So training and awareness campaign approach may play a vital role in changing the existing pattern of unethical use of antibiotics in chicken that enforce towards safe poultry products production, reduce cost of poultry production and finally increase the profitability of trained small- scale poultry farmers.

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