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Level of biosecurity information among broiler farmers in Kashmir

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Abstract

Present study was aimed to investigate the level of biosecurity information among poultry farmers in Kashmir. Information related to housing, management practices and farm-level biosecurity was collected from 50 broiler farms in a pre-devised proforma through semi-structured interview and personal observations. Descriptive statistics (*per cent* value) was used for data presentation. Investigation into housing and management revealed ventilation management as critical and challenging task. Semi-structured interview and farm observations revealed that although standard farm practices were followed, the farm-level biosecurity information among the farmers was limited and any concrete plans to the effect were lacking. Even personal protection was not followed to the optimum. Self-medication, lack of disease certification concept and non-observance of antibiotic withdrawal period before disposal, were realized as a great concern.

Keywords: Biosecurity, broiler farming, Kashmir

Introduction

Poultry industry is an important and rapidly growing agro-economic sector with an evident contribution to GDP at all levels. It promises food security combating malnutrition at gross root besides employment generation and socio-economic upliftment. Poultry diseases pose a potential threat to the economics of poultry industry and at many occasions have caused severe financial losses to the farmers (Rahman and Samad, 2003) [12]. Continuous selection of birds for high juvenile body weights, intensivism with high stock density, improper biosecurity and compromised managerial practices seem to increase the susceptibility of poultry to various diseases. While zoonosis is an important human health concern, human-to-poultry host jump, adaptation and pandemic spread of pathogens under changing climatic conditions is an emerging challenge (Lowder *et al.*, 2009) [9]. Further spill over of the pathogens from and into wild bird species continues to be a potential threat to poultry industry as well as human health (Garcia-Martinez *et al.*, 2013) [4]. In Kashmir valley, poultry sector is faced with inherent challenges. Chicks, feed ingredients and vaccines are imported from other states. Also, a large chunk of table birds including culled layers are imported. The temperate climatic conditions require closed housing. The migratory birds constitute an additional risk factor. So far there has been no assessment of farm-level biosecurity information among the farmers of the valley. Most of the poultry farms being of small scale, it may be opined that their knowledge regarding preventive measures is limited to vaccination and preliminary cleaning of sheds. This is further accentuated by lack of policy regarding preventive biosecurity. There is no control on introduction of new vaccines in the region. As a matter of fact, biosecurity is a weakest link public good, where the total amount of protection approximately equals the level of the weakest provider (Siekkinen *et al.*, 2012) [13]. Hence the sector is perhaps one of the most vulnerable to a natural and/or introduction of a foreign, emerging, remerging and/or zoonotic diseases which not only pose threat to animal health and production system, but also, a great human health concern. Hence present study was aimed to investigate the level of biosecurity information among poultry farmers in Kashmir.

Materials and Methods

Broiler farm epidemiology proforma devised by the authors (Table 1) was utilized for the

study. Information related to housing, management practices and farm-level biosecurity was collected from 50 broiler farms through semi-structured interview and personal

observations. Descriptive statistics (percent value) was used for data presentation.

Table 1: Broiler farming: epidemiology-cum-performance evaluation: proforma partly used for present study.

Farm ID:			
Proforma For Poultry Farms (Page 1)			
Farm Name & Address			
Owner's Name & Address			
Positioning (GPS)	Latitude:	Longitude	Ht. MSL
Phone:		Farm Vet: Dr.	
Details of Housing			
No. of sheds		Distance b/w sheds	
No. stories		No of rooms/ shed	
Dimensions		Orientation of sheds	
Floor area		Capacity:	
Ventilation	Ridge/ Cross/ Lateral	Fans/Exhaust	
Windows	Size:	Height from floor	No.:
Window protection		Foot dip at door	
Ventilation management			
Nature of construction			
Roofing insulation			
Location	Residential/Agricultural/Industrial/		
Management System			
Deep Litter / cage	All in all out / Multiple age groups		
Gap between batches		No. of batches/yr	
Litter material		Litter thickness	
Light source	Natural/Incandescent/Fluorescent		
Duration		Wattage	
Heating Devices Used			
Temp schedule			
Feed storage			
Feed used with source			
Pre starter to	Starter to	Developer to	Finisher to
Mash/ Pellet/ Crumbs		Others	
Feeder Type	Round/ linear/ hanging	Metallic / Plastic	
Automatic/ Manual	F. No.	F. Capacity	
Feeding Frequency		Feeding space/chick	
Feed additives used			
Water Source	Tap / Open well / Stream /Tube well/		
Waterer Type	Fountain/Bell/Channel/Basin/		
Metallic/Plastic	W. No.	Drinking Space	
Watering Frequency		Farm records	Y/No
Biosecurity/Sanitation (Page 2)			
Method of shed cleaning			
Disinfectants for Shed			
Disinfectants for utensils			
Disinfectants for foot dip			
Disposal of used litter			
Reuse of litter	Yes/No		
Disposal of dead carcasses			
Water sanitizers			
Other biosecurity measures			
Approx. distance from nearby farm			
Personal movement between farms	Yes/No		
Movement of vehicles	Yes/No		
Predator problem	Yes/No		
Nature of predator	Rodents / Snakes / Wild birds/		
Control measures			
Health Management			
Vaccination Schedule	ND	/IBD	/
Coccidiostats used			
Routine medication (medicine & route)			
Diseases Encountered (age wise)			
Weeks	Disease/ condition	Mortality	Medication
1 st			
2 nd			

3 rd							
4 th							
5 th							
FLOCK RECORD (Page 3&4)							
Farm ID							
Date of Hatch			Hatchery				
Type of Chick				Flock strength			
Transient mortality				Feed			
Sanitizers used							
Vaccination details							
Day	Mortality	Disease	Temp		Remarks (avg. wt., etc)		
			Min	Max			
1.							
2.							
3.							
4.							
Avg. B.Wt				Total Weight			
No. of Birds				Total feed used			
FCR		FE		Mortality			
Production Cost		Chick		Medication			
Feed		Labour		Litter/saw dust			
Other costs			Farm gate Price				
Any taxes			Any deductions				
Disposal Date:			Rate				
Total Returns							
Sale Procedure							
Wholesaler			Retailer				
Consumer			Processing plant				
Sale Proceeds Received							
Immediately			Afterwards				
Any rate fixing mechanism							
Labour Management							
Type of Labour			No. /1000 birds				
Labour Training		Yes/No					
Check List Of Diseases (page 5)							
Disease/ Condition			Rearing period (weeks)				
			1 st	2 nd	3 rd	4 th	5 th
Sudden death							
Omphallitis							
Colibacillosis							
Salmonellosis							
Infectious bronchitis							
ILT							
Infectious coryza							
Fowl cholera/pasteurellosis							
ND							
IBD							
CRD							
Leechi/hydropericardium syndrome							
Coccidiosis							
Ascites							
Visceral Gout							
Articular gout							
Aspergillosis							
Necrotic enteritis							
Nonspecific respiratory affection							
Nephrosis							
Deficiency disorders							
IBD + ND							
IBD + Coccidiosis							
IBD + ND + Coccidiosis							
IBD + Ascites							
Ascites + Colibacillosis							
IBD + Ascites + Colibacillosis							
Salmonella + E. coli							
Biosecurity Information (Page 6)							

S. No.		Response	
		Y	N
1.	Have a written biosecurity plan	Y	N
2.	Consulting biosecurity advisor	Y	N
3.	Biosecurity considerations at time of construction	Y	N
4.	Pest control concerns	Y	N
5.	Ventilation safety nets installed	Y	N
6.	Insect & rodent control	Y	N
7.	Use of protective clothing	Y	N
		Y	N
		Y	N
8.	Restricted personal movement	Y	N
9.	Restricted vehicle movement	Y	N
10.	Change of attire from shed to shed	Y	N
11.	Personal sanitation (shed to shed)	Y	N
12.	Regular expert inspection of farm	Y	N
13.	Concept of quarantine	Y	N
14.	Sterilization and sanitation concepts	Y	N
15.	Knowledge of preventive medication	Y	N
16.	Disease certification before disposal	Y	N
17.	Antibiotic withdrawal period observed	Y	N
18.	Medication without consultation	Y	N
19.	Use of water sanitizers	Y	N
20.	Feed quality evaluation done	Y	N
21.	Knowledge of zoonotic diseases	Y	N
22.	Knowledge of contagious diseases	Y	N
23.	Training regarding disease control	Y	N
24.	Updating knowledge regularly	Y	N
25.	Measures for insect & rodent control (pesticides/traps/etc.)		
26.	Special sanitation measures between batches		
27.	Special carcass disposal measures		
28.	Special Litter disposal measures		

Results

Examination of 50 broiler farms revealed that 100% farms had concrete construction with 80% houses having plastered (cemented) walls whereas 20% had mud plastered walls. 72% of the houses were single storied with multiple rooms and 28% double storied. Windows were placed at 5ft high in 84% houses and larger windows at 3ft high were present in 16% houses. None of the houses had exhaust fans installed. Placement of windows on opposite walls was seen in 86% houses, where as in 10% it was lateral and in 6% house it was on all four walls. The farmers reported ventilation management as the most tedious task especially in winters. Closing of glass windows caused building up of ammonia whereas opening lead to drop of house temperature. Farmers usually covered windows fully or partially with guinea bags. All farms (100%) reared chicks on deep litter using saw dust as litter, and followed all-in-all-out system. Cleaning of she sheds and equipments using detergents and sanitizers, after each hatch was followed by all farmers.

The biosecurity level information with farmers is presented in Table 2. 100% farmers reported having pest control concerns;

restricted personal movement; restricted vehicle movement; sterilization and sanitation concepts; knowledge of preventive medication; used water sanitizers; adopted measures like pesticides, traps, etc. for insect and rodent control; and followed special sanitation measures between batches. However, none of the farms had a written biosecurity plant. The concept of disease certification and observing antibiotic withdrawal period before disposal was non-existent. Use goggles for eye protection; change of attire from shed to shed, regular feed quality evaluation, and updating knowledge regularly was not reported by more than 80% farmer. Further 50 to 80% farmers reported negative for use of face masks; personal sanitation (shed to shed); regular expert inspection of farm; concept of quarantine; knowledge of zoonotic diseases; and training regarding disease control; whereas positive reports were recorded for biosecurity considerations at time of construction from 86% farmers; and for Consulting biosecurity advisor, installation of ventilation safety nets; use of overalls, medication without consultation, knowledge of contagious diseases and special carcass disposal measures from 50 to 80% farmers.

Table 2: Farm-level biosecurity information among poultry farmers

S. No.	Measures of Biosecurity		Response (N=50)			
			Yes		No	
			No	%	No	%
1	Have a written biosecurity plan		0	0	50	100.00
2	Consulting biosecurity advisor		38	76.00	12	24.00
3	Biosecurity considerations at time of construction		43	86.00	7	14.00
4	Pest control concerns		50	100.00	0	0.00
5	Ventilation safety nets installed		37	74.00	13	26.00
6	Use of protective clothing	Masks	21	42.00	29	58.00
		Goggle	7	14.00	43	86.00
		Overalls	34	68.00	16	32.00

7	Restricted personal movement	50	100.00	0	0.00
8	Restricted vehicle movement	50	100.00	0	0.00
9	Change of attire from shed to shed	5	10.00	45	90.00
10	Personal sanitation (shed to shed)	17	34.00	33	66.00
11	Regular expert inspection of farm	23	46.00	27	54.00
12	Concept of quarantine	24	48.00	26	52.00
13	Sterilization and sanitation concepts	50	100.00	0	0.00
14	Knowledge of preventive medication	50	100.00	0	0.00
15	Disease certification before disposal	0	0.00	50	100.00
16	Antibiotic withdrawal period observed	0	0.00	50	100.00
17	Medication without consultation	38	76.00	12	24.00
18	Use of water sanitizers	50	100.00	0	0.00
19	Feed quality evaluation done	5	10.00	45	90.00
20	Knowledge of zoonotic diseases	19	38.00	31	62.00
21	Knowledge of contagious diseases	39	78.00	11	22.00
22	Training regarding disease control	13	26.00	37	74.00
23	Updating knowledge regularly	9	18.00	41	82.00
24	Measures for insect & rodent control (pesticides/traps/etc.)	50	100.00	0	0.00
25	Special sanitation measures between batches	50	100.00	0	0.00
26	Special carcass disposal measures	27	54.00	23	46.00
27	Special Litter disposal measures	10	20.00	40	80.00

Discussion

Investigation into housing and management revealed ventilation management as critical and challenging task. Besides other factors unsatisfactory ventilation has been incriminated as an important factor in respiratory diseases and PHS (Guo *et al.*, 2007; Baghbanzadeh and Decuypere, 2008; Hassanzadeh *et al.*, 2009) [5, 1, 6, 7]. Unsuitable ventilation has been found to cause higher incidence of PHS/ascites in broiler chicken (Movassagh Ghazani *et al.*, 2009). Poor ventilation associated with higher oxygen demands during second half of the rearing period make the fast growing broiler strains susceptible to PHS (Hassanzadeh, 2009; Beheshti *et al.*, 2011) [6, 7, 2]. Hypoxia has been considered as a key factor in pathogenesis of ascites (Julian, 2000) [8].

Semi-structured interview and farm observations revealed that although standard farm practices were followed, the farm-level biosecurity information among the farmers was limited and any concrete plans to the effect were lacking. Even personal protection was not followed to the optimum. Self-medication, lack of disease certification concept and non-observance of antibiotic withdrawal period before disposal, were realized as a great concern. Farm level biosecurity is of pivotal importance in prevention of infectious, contagious and zoonotic diseases (Boklund *et al.*, 2004; Niemi *et al.*, 2009; Steenwinkel *et al.*, 2011) [3, 11, 14]. Continuous selection of birds for high juvenile body weights, intensivism with high stock density, improper biosecurity and compromised managerial practices have been incriminated for increased susceptibility of poultry to various diseases. The importance of biosecurity warrants emphasis especially as even a single window in the value chain may outweigh all other measures and prove detrimental the farm. The total amount of protection equals the level of the weakest point or provider (Siekkinen *et al.*, 2012) [13].

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