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A survey on the risk of zoonotic diseases, antibiotic usage and management of poultry farms of Udaipur district

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Abstract
The emergence and spread of zoonotic disease in poultry farms have a potential implication for public health. To control these zoonotic diseases, it is important to adopt proper vaccination schedule, follow isolation and quarantine practices and apply the necessary biosecurity measures. Further the practice of regular deworming and minimizing the contact with other animals can also prove to be beneficial in reducing the risk of zoonotic diseases. A total of 21 poultry farmers were interviewed in the study area. A set of questions were asked from the poultry farm personnel which included the risk of zoonotic diseases at their farm, their antibiotic usage practices, and their disease management.

Keywords: Poultry, zoonotic disease, antibiotic usage, and disease management

Introduction
Monitoring *Salmonella* contamination on poultry farms is a challenging issue and relies primarily on the implementation of biosecurity measures in the farm setting and the use of antibacterial agents (Donado-Godoy *et al*., 2012) [3]. Nevertheless, the excessive use of antibacterial medicines in the poultry industry, either as growth promoters or for treating disease, may lead to the emergence of antimicrobial resistance (AMR) among *Salmonella* isolates with potential health hazards (Prestinaci *et al*., 2015) [5]. The total poultry production in India was 729.21 million (Livestock census 2012) [7] and in 2019, the production is 851.81 million (Livestock Census, Directorate of Economics and Statistics and Animal Husbandry Statistics Division, Department of Animal Husbandry, Dairying & Fisheries, M/O Agriculture). According to this the growth rate in poultry production was 16.81%. Over 45.78% increase in backyard poultry and total backyard poultry is 317.07 million in 2019.The commercial poultry has increased by 4.5% and the total commercial poultry is 534.74 million.
Poultry is a proven undertaking for livelihood. It can be reared by the underprivileged of the society to the wealthy people of the society. Both commercial and backyard poultry are popular in the country due its economic and nutritional status. Poultry is a survival tool for the rural society during financial crisis. Foodborne diseases hinder socioeconomic development by damaging health care systems, and harming national economies, tourism and trade. Food supply chains are now crossing multiple national borders (WHO, 2019) [8].

Materials and Methods
Poultry farming involve the activities of livelihood at one end to the commercial operation at the other end. Data from the poultry farmers were collected by conducting a questionnaire-based survey in the form of interviews. Thus, a total of 21 poultry farmers were interviewed in the study area.

Result and Discussion
A set of questions were asked from the poultry farm personnel which included the following details.
1. The risk of zoonotic diseases
2. Antibiotic usage practices

3. Disease management support

The risk of zoonotic diseases

On surveying the poultry farmers, it was revealed that 61.90% of the farmers had basic knowledge about the zoonotic diseases (Table 1). Similarly, 95.24% and 90.48% of the farmers regularly vaccinated the flock and maintained the proper records, respectively. Similar findings were revealed by Al-Mustapha *et al*., 2020[1] who reported that 95.2% of the poultry farmers used to follow complete vaccination schedule as opposed to 4.8% of poultry farmers who did not follow the complete vaccination schedule. While, contrasting findings were revealed by Sankhyan *et al*., 2013 [6] and Kumaresan *et al*., 2008 [4], who reported 100% and 61% of the poutry farmers as not following the proper vaccination schedule of the poultry flock, respectively. Around 76.19% of the poultry farmers revealed that the poultry birds did not have contact with other animals. While, 23.81% farmers disclosed that the birds encountered other livestock species. The contact of poultry birds with street and wild animals was not revealed by any of the farmers. The practice of isolation and quarantine was followed by 61.90% farmers. On the other hand, regularly deworming was done in only 7 out of the 21 poulter farms surveyed.

The emergence and spread of zoonotic disease in poultry farms have a potential implication for public health. To control these zoonotic diseases, it is important to adopt proper vaccination schedule, follow isolation and quarantine practices and apply the necessary biosecurity measures. Further the practice of regular deworming and minimizing the contact with other animals can also prove to be beneficial in reducing the risk of zoonotic diseases. In the present study, it was revealed that majority of the poultry farmers were aware about the risk of zoonotic disease. Thus, with proper knowledge and adoption of biosecurity and public health practices, the risk for acquiring zoonotic disease can be minimized.

Table 1: The risk of zoonotic diseases

S. No.	Variable	Category	Overall respondents (N= 21)	
			F	%
1.	General awareness about zoonotic diseases	Yes	13	61.90
		No	8	38.10
2.	Vaccination of poultry birds	Done	20	95.24
		Not done	1	4.76
3.	Contact with other animals	Livestock	5	23.81
		Street Animal	0	0.00
		Wild Animal	0	0.00
		No Contact	16	76.19
4.	Isolation and Quarantine	Done	13	61.90
		Not done	8	38.10
5.	Regular deworming	Done	7	33.33
		Not done	14	66.67
6.	Maintenance of vaccination record	Yes	19	90.48
		No	2	9.52

Antibiotic usage practices

The awareness about the antibiotic resistance as revealed by the poultry farmers in the present study indicated that majority (80.95%) of the farmers were not having the basic knowledge about the antibiotic resistance (Table 2). Antibiotic resistance is a global threat which causes deaths among human and animal populations and also leads to financial losses. Out of the 21 farmers surveyed only 8(38.1%) farmers revealed the proper follow up of withdrawal period. While, 61.9% of the farmers were not following the proper withdrawal period. Awogbemi *et al*., 2018 [2] and Sirdar *et al*., 2012 [7] reported dissimilar finding in which, it was revealed that 15% and 25% of the farmers did not follow the withdrawal period, respectively. The majority (61.9%) of the farmers in the study area used the antibiotics in the poultry farms for treatment purposes only. While, only 19.05% of the farmers used antibiotics for treatment and prophylaxis. Similar finding was reported by Sirdar *et al*., 2012 [7] in which it was mentioned that 61% of the poultry farmers used the antibiotics for therapeutic purposes. While, contrasting findings were reported by Awogbemi *et al*., 2018 [2], in which it was revealed that only 3.3% of the poultry farmers used antibiotics for the treatment purposes.

Table 2: Antibiotic usage practices

S. No.	Variable	Category	Overall respondents (N= 21)	
			F	%
1.	Awareness about antibiotic resistance	Yes	4	19.05
		No	17	80.95
2.	Withdrawal period followed	Yes	8	38.10
		No	13	61.90
3.	Usage of antibiotics	Treatment	13	61.90
		Treatment + Prophylaxis	4	19.05
		Treatment + Prophylaxis + Growth Promotion	4	19.05

Table 3: Commonly used antibiotics at the poultry farms

S. No.	Variable	Category	No. of farms	Percentage of antibiotic usage
1.	Commonly used antibiotics at the poultry farms	Oxytetracycline	5	23.81
		Erythromycin	2	9.52
		Co-trimoxazole	2	9.52
		Enrofloxacin	11	52.38
		Levofloxacin	6	28.57
		Azithromycin	1	4.76
		Ceftriaxone	3	14.29
		Sulpha drugs	3	14.29
		Ciprofloxacin	1	4.76
		Tylosin	1	4.76

Among the various antibiotics used in 21 poultry farmers (Table 3), the most common antibiotics administered to the poultry were enrofloxacin (11 farms), levofloxacin (6 farms), oxytetracycline (5 farms) followed by ceftriaxone, sulpha drugs, erythromycin, co-trimoxazole, etc. Antibiotics are used for treatment, prophylaxis, and growth promotion. Poor awareness and indiscriminate use of antibiotics by the poultry farmers leads to the development of antimicrobial resistance. Thus, improving the public awareness and knowledge about the judicious use of antibiotics will help in reducing the illegal use of antibiotics. It will also prevent the spread of antibiotic resistant organism from the poultry farms to the general population through the food chain.

Disease management support: According to the survey it was revealed that 57.14% of the farmers used the veterinary services rendered by a qualified veterinary doctor (Table 4). While, the remaining 42.86% farmers consultanted the veterinary field assistants for therapeutic support. Regarding the purchase of medicines, it was found that majority (90.48%) of the farmers used to purchase the medicines from the chemist. Among the different types of medical practices, the most commonly used medicine was allopathic, followed by homeopathic medicines. Apart from these two practices home remedies were also utilize for the treatment of diseases in the poultry farm. It was also found that the poultry farm management was mainly self-managed (71.43%), followed by the NGOs (19.05%) and Govt. support (9.52%).

Table 4: Disease management support

S. No.	Variable	Category	Overall respondents (N= 21)	
			F	%
1.	Veterinary services	Veterinarian	12	57.14
		Veterinary field assistants	9	42.86
		Non-technical	0	0.00
2.	Medicine procurement	Government	0	0.00
		Chemist	19	90.48
		Veterinary field assistants	2	9.52
3.	System of medical practice	Allopathic	11	52.38
		Allopathic + Homeopathic	3	14.29
		Allopathic + Homeopathic + Home remedies	4	19.05
		Allopathic + Home remedies	3	14.29
4.	Schemes/ programme supporting the poultry farm management	Government	2	9.52
		NGO	4	19.05
		Self-managed	15	71.43

The prevalence of various diseases on the poultry farm along with poor supply of vaccines and medicines are a major constraint in poultry production. The support provided by the government agencies and NGOs can help in increasing the productivity of poultry farms and reducing the incidence of diseases.

Conclusion

To control these zoonotic diseases, it is important to adopt proper vaccination schedule, follow isolation and quarantine practices and apply the necessary biosecurity measures. The medicines should be used judiciously only after the prescription by a qualified veterinarian. Thus, good management practices, enhanced awareness about the biosecurity measures and prevention of diseases on the poultry farms should be followed for improving and enhancing the poultry rearing and production.

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