SOCIO DEMOGRAPHY OF BROILER FARMERS, THEIR PERCEPTION AND INDISCRIMINATING USE OF ANTIBIOTIC AND ITS EFFECTS

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DECEMBER, 2020

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A Thesis
Submitted to the Faculty of Agriculture,
Sher-e-Bangla Agricultural University, Dhaka.
In partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE
IN
BIOCHEMISTRY

SEMESTER: JULY- DECEMBER, 2020

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This is to certify that the thesis entitled, **"SOCIO DEMOGRAPHY OF BROILER FARMERS, THEIR PERCEPTION AND INDISCRIMINATING USE OF ANTIBIOTIC AND ITS EFFECTS"** submitted to the Department of Biochemistry, Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE in BIOCHEMISTRY,** research work carried out by **NUSRAT JAHAN LINA** bearing Registration No. **18-09209** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma in any other institutes.

I further certify that such help or source of information, as has been availed of during the course of this investigation has duly been acknowledged.

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DEDICATED
TO MY
BELOVED PARENTS

Acknowledgements

*All praises and complements are due to the Supreme Regulator and Ruler of the Universe, "**Almighty Allah**" for the blessing upon the successful accomplishment of education, to complete the research work and theses leading to Master of Science (MS) in Biochemistry. The author likes to express her heartfelt respect, deep sense of gratitude and profound indebtedness to her reverend Supervisor, **Professor Dr. Kamal Uddin Ahmed**, Department of Biochemistry, Sher-e- Bangla Agricultural University, Dhaka for his scholastic guidance, valuable advice, important suggestions and supervision throughout this research work and in preparing this theses. The author also extends her sincere appreciation, profound regards and cordial thanks to her Co–Supervisor, **Professor Md. Nuruddin Miah,** Department of Biochemistry, Sher-e- Bangla Agricultural University, Dhaka for his kind help constructive advice , faithful criticism and encouragement during the compilation of this theses. The author feels to express her heartfelt thanks to the honorable chairman of Biochemistry **Professor Dr. Ashrafi Hossain** for her valuable suggestions, instructions, cordial help and encouragement during the period of the study. Profound thanks and indebtedness are also due to all the teachers of Biochemistry Department, Sher-e-Bangla Agricultural University, Dhaka for their valuable teaching, sympathetic co–operation and inspirations throughout the course of this study. The author pleased to all stuffs, workers of Department of Biochemistry, Sher-e- Bangla Agricultural University, Dhaka for their valuable and sincere help in carrying out the research work. Mere diction is not enough to express profound gratitude and deepest appreciation to my parents, sister, brother and husband for their ever ending prayer, encouragement, sacrifice and dedicated efforts to educate me to this level.*

December, 2020 ***The Author***

SOCIO DEMOGRAPHY OF BROILER FARMERS, THEIR PERCEPTION AND INDISCRIMINATING USE OF ANTIBIOTIC AND ITS EFFECTS

ABSTRACT

Residual result of antibiotics and its inefficacy to microorganisms has been recognized as a public health hazard worldwide. This study was conducted among 98 broiler farms of three selective districts of Bangladesh from August to December, 2019 to explore the antibiotic use pattern and perception of farmers on antibiotic. Semi-structured questionnaire was used to gather information. Farmers administered antibiotics mainly as therapeutics (84.69%). Over one third (33.67%) farmers used antibiotic as prophylaxis. Almost half (48.97%) bought antibiotics with registered vet doctor's advice. But 43.88% farmers took self-decision for antibiotics use. Ciprofloxacin (41.83%), Colistin sulphate (24.49%) and Enrofloxacin (17.35%) were found to be three main therapeutic drugs of choice. Nearly half (47.96%) of respondents thought that mal-absorption was the main residual effect of antibiotics. A vast majority (91.84%) of poultry growers had no idea about antibiotic resistance. Antibiotics were used ordinarily in broiler farm in the study area. Intervention should be taken to minimize the use of unethical and self-choosing antibiotics in the study area.

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LIST OF ABBREVIATIONS AND ACRONYMS

Full word	Abbreviation
And others	*et al.*
World Health Organization	WHO
Food and Agriculture Organization	FAO
Frequency	N
Percentage	%
Codex Alimentarius Commission	CAC
Statistical Package for Social Science	SPSS
Ministry of Agriculture, Food and Fisheries	MAFF
International Food Policy Research Institute	IFPRI

CHAPTER I

INTRODUCTION

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INTRODUCTION

Poultry is one of the world's fastest growing sources of protein (Apata D.F., 2009). Although hazards from poultry has health effect on human (CAC, 1999). Antibiotics have been successfully used in humans and veterinary medicine as therapeutics, propylaxis and growth promoting agents (Agada *et al*., 2014). Veterinary antibiotics affect consumer through residual hazard (Chanda *et al*., 2014). Also, enormous antibiotics use in veterinary field, develop resistant bacterial strains (Hassan *et al*., 2014). Emerging antimicrobial resistance has become a public health concern worldwide (Agada *et al*., 2014; Kaye *et al*., 2004).

Farmers used antibiotics as prophylactics, therapeutics and growth promoter (Wadoum *et al*., 2016). In developing countries, overprescribing and the excessive use of antimicrobials create antimicrobial resistance in human (Coyne *et al*., 2018). In addition, readily available antibiotics in local stores without prescription has led to the intense use and misuse of antibiotics (Islam *et al*., 2016). Study revealed that antimicrobial agents are readily available to people in local drug stores without prescription in Nigeria (Kwaga and Adesiyun, 1984).

In Bangladesh, massive magnitudes of antibiotics used annually (Sarker *et al*., 2016). Commercial poultry farmers in Bangladesh indiscriminately use antibiotics without any veterinary consultation (Stutz *et al*., 1984; Sirdar *et al*., 2012). Antibiotics are extensively used as growth promoters as like other developing countries in Bangladesh in poultry to control diseases and facilitated feed conversion and growth of birds (Sarker, 2016; Gelband *et al*., 2015). The ignorance of the local farmers, lack of proper veterinary service in rural/remote areas and the desire for high profits provoke the farmers to use antibiotics indiscriminately (Stutz *et al*., 1984; Sirdar *et al*., 2012). In developing countries like Southern Thailand, the picture is much worse. There is very little control of antibiotics use in food animals (WHO,2001). Therefore, antimicrobial

resistance is a global problem, and emerging antimicrobial resistance has become a public health fact worldwide (Kaye *et al*., 2004).

Proper veterinary antibiotic use notwithstanding their use has become particularly worrisome, especially for the fact of the potential to extend such drug into the human food chain. Also the possibility of reduced efficacy of such drugs which has been observed in some reports to be administered by non-qualified personnel (Boonmar *et al*., 1998;Thakur and Bajaj, 2006).

But the situation in the developing countries like Bangladesh is however different, where people can be easily bought antimicrobial agents from the local drug stores without prescription and use irrationally. Therefore, that practice has led to indiscriminate use of antibiotics and all consequences cause serious health hazards with emergence of antibiotic resistance (Hassan *et al*., 2014).

A related survey was performed in selected Broiler Farms of Bangladesh on antibiotic usage patterns. In which common usage of antibiotics were for therapy (43.8%), and prophylaxis (31.5%). Twenty eight different patterns of antibiotic usage were observed. Most of the farmers used antibiotics without any prescription. Fluroquinolones (68.4%) were the most commonly detected antibiotics (Islam *et al*., 2016).

Hence, investigating the farmer's perception about antibiotic use is essential for the safety of poultry and consumers. No comprehensive work has been documented till date on the perception of farmer's about use of antibiotics in Bangladesh. Therefore, we need clear understanding of current antimicrobial use pattern and perception of farmers on antibiotic use.

Objectives of the study were

- To collect the baseline information on therapeutic antibiotic use in broiler.
- To know farmer's perception regarding the use of antibiotics in broiler farm.

CHAPTER II

REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

This study explore the indiscriminating use of antibiotics in poultry and resulting residual effects on consumer through animal food origin. Antibiotic resistance in pathogenic organisms has been recognized as a severe human health hazard worldwide. The major antibiotics used for humans are usually the same as those used in veterinary medicine. It was found that the usage patterns of veterinary drugs have significant impact on human health. Therefore, the study was conducted to assess the antibiotic usage patterns in broiler industry and the antibiotic residues in broiler meat in the country. The previous literature were reviewed and maintained in the following section.

Fouepe *et al***.** (2017) shown that in Dschang and its surroundings, 57.8% of the men and 46.2% of the women surveyed raised broilers. These breeders had an average age of 42 years with a minimum of 18 years and a maximum of 75 years. In Chad, the poultry farmers in the six savanna territories are mainly men (90%), with an average age of 36 years, with households having an average of 7 individuals with 4 of them were active. It was mainly farmers (89%) who had been engaged in poultry farming for an average of 11 years (Thakur YR and Bajaj BK; 2006). In Bangui, in terms of education, all the breeders surveyed have been to school. Breeders with secondary education respectively account for 50 and 57.1% for broiler and laying hen breeders. Moreover, most of them (73%) are under 50 years of age. In Chad, 67% of poultry farmers had been to school, with 47% having completed primary school and only 17% had been to secondary school (Maho *et al*., 2004). The surveyed breeders have an average of 7 years of professional experience and 46% have less than 5 years' experience.

Islam (2003) reported that the poultry sub-sector is crucially important in the context of agricultural growth and improvement of diets of people in Bangladesh. The sub-sector is particularly important because of its significant source for the supply of protein and nutrition in a household's nutritional

intake. It is an attractive economic activity as well, especially to women and poor people. So, nowadays poultry farming is recognized profitable business in Bangladesh and getting popularity as an employment opportunities.

Abdu (2007) noted that, for excluding or reducing the potential for the transmission and spread of diseases to animals, humans or an area initially free from the disease-causing agents, biosecurity is very much important. Strict biosecurity measures, in addition to vaccinations, are strategic prevention and control policies adopted to control some contagious poultry diseases. Good husbandry practices such as adequate feeding, housing and stocking to avoid overcrowding, good ventilation, proper disposal of wastes, cleaning and disinfection of poultry premises help to keep out infections and their spread (Jordan, 1990; Ameji *et al*., 2012).

Eze *et al*., (2017) reported that poor environmental sanitation and practices, leading to increased exposure to bacterial pathogens with resultant immune-suppression may have contributed to the observe dependency of poultry farms on antibiotics. Poor or absence of biosecurity practices in farms results in high levels of baseline mortality or infectious diseases (Sonaiya and Swan, 2004; Badubi *et al.* 2004; Abdelqader *et al.,* 2007; Biswas *et al.,* 2008; Bell, 2009; Ison *et al.,* 2012). Poultry farmers provided foot dip with disinfectant which is contrary to the finding of Ameji *et al.* (2012) in Kogi State, Nigeria and Ambarawati *et al*. (2010) in Bali, Melbourne, Australia where poultry farmers had poor sanitation with the majority of farmers not having footbath.

According to Mccrea and Bradley (2008) sanitation is crucial in poultry houses in other to eliminate disease agents. Disinfectant footbaths may help to decrease the dose of organisms on boots. Shane (1995) noted that effective cleaning and disinfecting methods can substantially decrease disease transmission by reducing pathogens in the environment below infection level. Similarly, Sharma (2010) stated that clean poultry farm will reduce disease spread.

Financial difficulty is the most serious problem for poultry marketing and finance. Lack of financial assistance as an important economic problem faced by the farmer in poultry business. Inadequate capital as a problem encountered by farmer in commercial poultry farming. Lack of awareness about government sources of financial help might have made it difficult for the farmer to solve their financial problems. In accordance with the findings of Oyeyinka *et al*. (2011) in Oyo state, Nigeria, inadequate capital (83.2%), high cost of feeds (86.8%) and marketing problems (81.9%) were the most severe constraints of poultry industry problem.

Oyeyinka *et al*. (2011) also reported that, inadequate labour supply (74.7%) and lack of veterinary knowledge (86.8%) were the constraints for the poultry enterprises. Also, in Pakistan, previous survey in the poultry industry shows that the respondents had lack of financial credit, inadequate modern poultry equipment, lack of adequate poultry rearing knowledge and absence of government help and guidance etc. (Jamali *et al*., 2011).

Oladeji (2011) reported that sources of information for the farmers were recommended such as veterinary officers, television, poultry association, agricultural extension officers, workshops/seminars and journals etc. Also, 88.7% of radio users as information source, made use of information obtained at Gujarat in India. There was a significant relationship among age, educational qualification, scale of operation and source of information (Oladeji, 2011). Poultry farmers in Enugu State, Nigeria obtained information from multiple sources. However, the principal sources of information were co-poultry farmers (87.7%), veterinary officers (81.4%), textbooks (75.9%) and Internet (70.9%) (Eze *et al*., 2017). farmers were of the opinion that Radio (92.7%) and Television (90.3%) were the main sources of farmers awareness on poultry production techniques in Oyo state, Nigeria, (Oyeyinka *et al*., 2011).

The use of probiotics in animal feeds do not leave residues in animal products and promote animal performance and health (Fuller, 1989; Jin, 1997; Patterson and Burkholder, 2003; Zulkifli *et al*., 2000), because they improve diet

digestibility (Apata, 2008), resulting in better nutrient utilization and consequently, higher productivity (Kabir *et al*., 2004, Mountzouris *et al*., 2007; 2010). Zulkifli *et al.* (2000), observed higher weight gain in poultry when a group of poultry was treated with probiotics.

Gold and Mollering, (1996) noted that antimicrobial drugs have been proved remarkably effective for the control of bacterial infections and success in controlling infectious pathologies and increasing feed efficiencies (Engberg *et al*., 2000) Antibiotics, either of natural or synthetic origin are used to both prevent proliferation and destroy bacteria (Naliaka, 2005). Antimicrobials are used in food animals to treat or prevent disease and also to promote growth. Antibiotic use in commercial poultry can be divided into two categories: therapeutic antibiotics and growth-promotant antibiotics (Anonymous, 2003). Majority of the antibiotics used in poultry is for treatment of infections (Oyekunle *et al*., 2003; Apata, 2009). Therapeutic dose of antibiotics are used for treatment of bacterial infections (Oluwasile *et al*., 2014). Antibiotic growth promoters are used to inhibit or destroy bacterial growth and are administered as a low sub-therapeutic dose (Hughes and Heritage, 2004; Oluwasile *et al*., 2014). Several classes of antibiotics, including glycolipids (bambermycin), polypeptides (bacitracin), ionophores (salinomycin) and lactams (penicillin), are used in broiler chicken production for growth promotion and prevention of infectious diseases (Butaye *et al*. 2003; Singer *et al*. 2006).

Apata (2009) reported that the antibiotics are now particularly used in poultry farming for therapeutic purposes and are added in feed and water in sub-therapeutic doses for prophylaxis and growth promotion. Food animals poses a major risk for humans due to antibiotic resistance. Such of these antibiotics were used the world as follows- Virginiamycin, Avilamycin, Synercid, Aminoglycosides, Macrolides, Fluoroquinolones, Sulphonamides, Flavomycin, Avoparcin, Spiramycin, Bacitracin, Nitrofurans, Tetracycline, Colistin sulphate, Trimethoprine and Bioprine (coccidiostats) were commonly used in Kenya on poultry species (Wegener *et al*. 1999).

But by the 1970s, the excessive use of antibiotics started contributing to a surge in drug resistant germs or superbugs. Since then, antibiotic resistance has been recognized as a serious problem for public health worldwide (Nisha, 2008). By the course of time it has now been recognized by the major world health organizations as one of the top health challenges for this modern era due to its overuse and inappropriate uses in clinical arena (Donoghue, 2003). Both vet and human medicine contribute directly or indirectly to antibiotic resistance. The antibiotic also, an inevitable side effect of the use of antimicrobials is the emergence and dissemination of resistant bacteria (Van den Bogaard and Stobberingh, 2000). Several recent reviews survey antimicrobial resistance across many animal species. In animals, antimicrobial resistance in zoonotic enteropathogens (e.g., *Salmonella*) and commensals is of special concern to human health because those bacteria are most likely to be transferred through the food chain to humans, or resistance genes in commensal bacteria may be transferred to the zoonotic enteropathogens. There is considerable evidence that antimicrobial use in animals selects for resistance in commensals and in zoonotic enteropathogens (Oluwasile *et al*., 2014).

As the veterinary drug residues in poultry products can potentially be transmitted to humans via consumption of contaminated edible tissues and may lead to several pathological implications that are considered as major health issues. Chicken meat contaminated with drug residues may pose serious public health hazards in the form of antibiotic resistant bacterial formation, allergic manifestations or alteration of useful micro flora of digestive tract to no micro flora and/or harmful or non-healthy micro flora (Mund *et al*., 2016). Attention to possible adverse effects of using antibiotics to human health was first received worldwide coverage with the release of a report by Swann (1969). It was concluded that the probable hazard to human health was from feeding sub-therapeutic levels of antibiotics to food producing animals (as is the case with growth promoters). Link between antibiotic use in animals and the development of resistance in human pathogens is described in several reports (WHO, 1998; MAFF, 1998). The majority of human antibiotic resistance

problems have connection with use of antibiotics in animals with problems occurring in both hospital and community settings (Gold and Moellering, 1996). Serious and widespread community resistance problems which have developed because of over-use and misuse of antibiotics in people. (Chowdhury *et al*., 2009). According to the WHO, the emergence and spread of antimicrobial resistance in human pathogens is considered a global problem which increasingly affects the successful treatment of infectious diseases in humans (Acar *and Rostel,* 2001).

The human health concern is the risk of direct transfer of resistant human pathogens or transfer via the food chain. Antibiotic resistance genes may be transferred from animal pathogens or commensals to human pathogens (Van den Bogaard and Stobberingh, 1999 and 2000). There are many reports of resistant bacteria in animals and of human isolates of the same organism with similar resistance patterns (Van den Bogaard *et al*., 1997; Fey *et al*. 2000). There is ample evidence for transfer of this organism via the food chain (Threlfall *et al*., 2000) or by direct contact (Fone and Barker, 1994). Thus, antibiotic residues in foods of animal origin are one of the sources of concern among the public and medical health professionals (Nisha, 2008).

Presence of the antibiotics residues in food above the maximum level is recognized worldwide by various public health authorities as being illegal and their consumption could result in public health hazards including: development of resistant strains of microorganisms, hypersensitive reaction in sensitized individuals and distortion of intestinal micro flora (FAO, 1997).

Mund *et al*. (2016) reported that, penicillin residues in poultry can lead to severe anaphylactic reactions while eggs containing residues of sulfonamides in higher concentrations cause skin allergies upon consumption. The residues of animal drugs in human food threaten human health by being acutely or cumulatively allergenic, organotoxic, mutagenic, teratogenic or carcinogenic (Doyle, 2006). For example, violative residues of penicillin are the most frequently cited causes of allergic reaction in persons that consume animal

products containing residues. Many other drugs including tetracyclines, sulphonamides and aminoglycosides can also cause allergic reaction (Tollefson and Miller, 2000).

According to Dewdney *et al*. (1991) in human medicine drug allergy is a well-established side effect of the therapeutic use of antibiotics. Side effects caused by macrolides are uncommon and only a very few of these seem to be caused by allergic mechanisms. Clinically, drug allergy is characterized by a spectrum of reactions ranging from mild skin rashes to angioedema or life-threatening anaphylaxis. Antibiotic residues in meat and other foods might be responsible for similar hypersensitivity reactions in a small number of iundividuals.

Oluwasile *et al*. (2014) noted that antimicrobials in poultry production due to its possibility of forming residue in food and carcinogenic effect on human, most poultry farms still employs the use, as many claimed it to be effective against certain diseases especially salmonellosis, this is of serious public health concerns.

Various types of antimicrobial drugs are available in the market. The farmers are occasionally get confused by the advertisement of the different pharmaceutical companies claiming their products as the best and there is indiscriminate use without experimental support. In Bangladesh, only a few companies mention the withdrawal period of their product in packet. Our farmers are not so much literate that they can think about the residual effect of antibiotics which have been developed due to continuous use of these antimicrobial drugs. Animal producers in all parts of the world will increasingly face legislative and consumer pressures to reduce the use of antimicrobial drugs which are chemically related to antibiotics used to treat human disease (Chowdhury *et al*., 2009). Alo and Ojo (2007) reported a high usage of quinolones, gentamycin, neomycin, tetracycline, streptomycin and tylosin among poultry farms in Ekiti State, Nigeria. Similarly Ogunleye *et al.* (2008) reported the use of enrofloxacin, tetracycline, gentamycin streptomycin, furatadone, Tylosin norfloxacin among poultry farms in Abeokuta, Nigeria,

while Sirdar *et al.* (2012) also reported the use of oxytetracycline, colistin, tylosin and enrofloxacin among poultry farms in Khartoun, Sudan.

Okoli *et al.* (2002) and Okoli *et al.* (2005) reported that non-qualified personnel such as hawkers, small traders and illiterate market women are known to be involved in the retailing of veterinary drugs especially poultry medicines in south eastern, Nigeria. Antibiotic prescription pattern is that about half of the poultry farms practices self-medication, this has also been reported by Kwaga and Adesiyu (1984) that antimicrobial agents are readily available to people without prescription. Okoli *et al.* (2002) and Okoli *et al.* (2005) also reported that self-medication is rampant among poultry farmers largely due to claim of good experience by farmers, unavailability of veterinary services and the extra cost of veterinary services.

Reduction in antibiotic resistance problems in people could be assisted by improved on-farm management and farm disease control. Improvements in food production and food hygiene would reduce contamination of meat. However, there will be no specific reduction in antibiotic resistance in people until there is a concerted effort in hospitals, medical practices and the community to control the misuse and overuse of antibiotic in human medicine (Demir *et al*. 2008). Agricultural use of antibiotics causes the development of antibiotic resistance in both human and livestock pathogens. Data has shown that more bacteria are becoming resistant to one or sometimes several antibiotics. For example, the prevalence of resistance to five antibiotics among a particular strain of bacteria (like as *salmonella*) has increased from 0.6% in 1979 to 34% in 1996 (Gustafson and Bowen, 1997).

CHAPTER III

MATERIALS AND METHODS

CHAPTER III

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3.1. Location

This study was conducted at Wazirpur Upazilla of Barishal , Savar Upazilla of Dhaka, and Kaliakoir Upazilla of Gazipur district during August, 2019 to December, 2019.

3.2. Design

A cross-sectional study was conducted among broiler farmers to collect data. A total of 98 participants in three districts were selected using convenient sampling method. Data were collected using a pre-designed and semi-structured questionnaire. Face to face interview was conducted to collect information. Both the close and open type questions were asked to the respondents. Objectives and goals of the study were discussed indetails with the participants before data collection. Only interested farmers were included in this study. Those who were not interested to give their opinion and those who were absent during survey were excluded.

3.3. Study variables

The questionnaire consisted of some main subdivisions. Socio-demographic characteristics of farmers were age, sex, educational qualification, family income and farming experience. Basic information on farming system, biosecurity, causes of poultry industry problem and sources of awareness were recorded. Information on antibiotic use were its types, generation, manufacturer name, qualification of prescriptioners, route and purpose of antibiotic use and farmer knowledge and conception about antibiotic. Main problems of broiler farms and sources of preventive information were also asked from every farmers.

3.4. Statistical analysis

Frequency distributions and descriptive statistics (frequency, mean and median) for major demographic variables were calculated. Statistical Package for Social Sciences (SPSS) software was used for descriptive statistical analysis.

CHAPTER IV

RESULTS AND DISCUSSIONS

CHAPTER IV

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A total of 98 respondents were collected from Wazirpur Upazilla of Barishal, Savar Upazilla of Dhaka and Kaliakoir Upazilla of Gazipur district. Table 1 showed that Male and female participants were 90 (91.84%) and 8 (8.16%) respectively. Most of the farmers 78 (79.59%) lived in rural area. Majority 38 (38.77%) have completed primary education. More than half 60 (61.22%) lived depend on only farm income. Over half 53(54.08%) had more than 5 years farming experience. Maximum 70 (71.43%) family comprised of more than 4 members. About sixty 57 (58.16%) earned 10,000 BD/TK monthly.

Table 1: Demographic characteristics of farmers in three districts of Bangladesh

Parameters	Categories	Frequency (N)	Percentages (%)
Gender	Male	90	91.84
	Female	8	8.16
Living place	Rural	78	79.59
	Semi Urban	20	20.4
Religion	Muslim	82	83.67
	Hindu	16	16.33
Education	Illiterate	12	12.24
	Primary	38	38.77
	Secondary	33	33.67
	Higher secondary and above	15	15.31
Occupation	Only Farmer	60	61.22
	Farmer and others	38	38.77
Experience	≤ 5	45	45.91
	>5	53	54.08
Family member	≤ 4	28	28.57
	>4	70	71.43
Family income	5500-8000(Tk)	11	11.22
	8000-10000(Tk)	25	25.51
	10000-15000(Tk)	39	39.79
	16000-20000(Tk)	17	17.35
	21000(Tk)-Above	6	6.12

Table 2 shows that almost 82 (83.67%) farms were closed type. More than three fifth 63 (64.28%) farmers used rice husk as litter. Maximum 67 (68.37%) farms contained 500-1000 no. of birds. About 40 (40.82%) mortality of birds were more than twenty days. A great majority 91 (92.86%) respondents used the protective tools against germs. Mostly 40 (40.82%) farmers used disinfectants as safety tool.

Table 2: Farming system and hygienic status of farm

Parameters	Categories	Frequency (N)	Percentages (%)
Farms types	Close	82	83.67
	Intensive	16	16.33
Litter types	Sawdust	34	34.69
	Rice husk	63	64.28
	Sand	1	1.02
No. of birds	500-1000	67	68.37
	1500-2000	21	21.43
	2000-5000	7	7.14
	5000-Above	3	3.06
Mortality	Less than ten	35	35.71
	More than ten	23	23.47
	More than twenty	40	40.82
Use of protective tools	Yes	91	92.86
	No	7	7.14
Safety tools	Disinfectants	40	40.82
	Water Purifier	27	27.55
	Hand gloves	8	8.16
	Farm cloths	9	9.18
	Farm shoes	14	14.28

Figure 1 showed that almost half 47 (47.96%) farmers had lack of knowledge and they thought it as the main problem of farming. Lack of government awareness and corrupted syndicate believed to be the main cause by 25.51% and 15.31% farmers, respectively. Over half 53 (54.08%) of them perceived television as the main sources of getting information regarding to solve the problem in poultry industry.

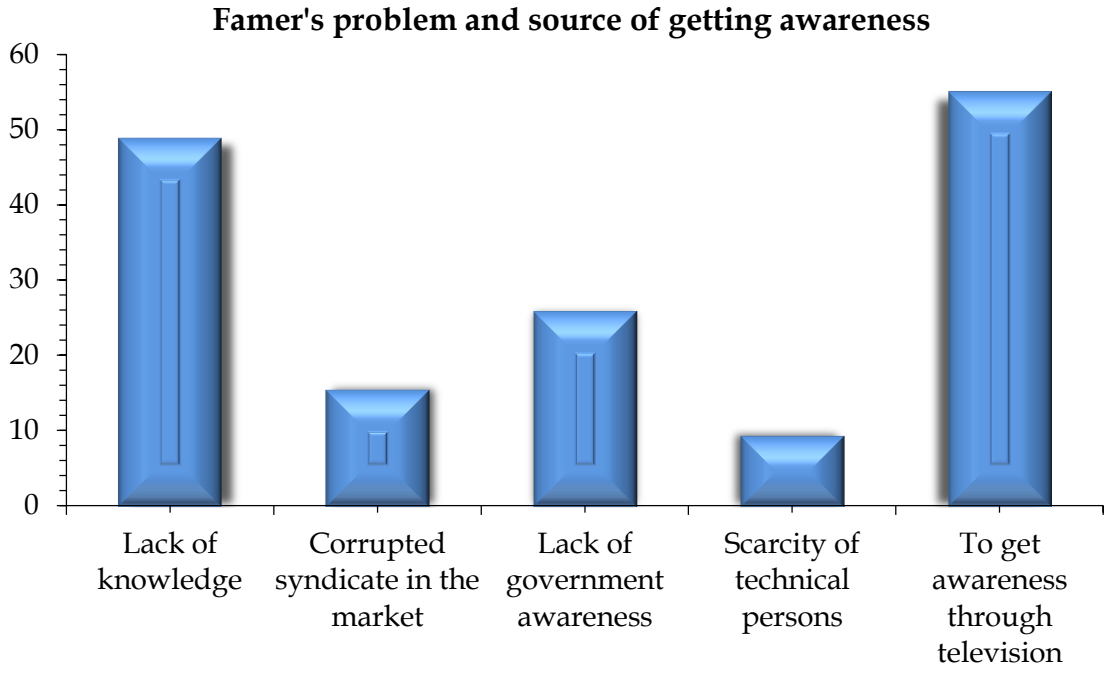

Figure 1: Farmers belief of problem and sources of awareness to solve the problem

According to this study figure 2 showed that more than one third 47 (47.96%) mal-absorption and 19.39% self-immune status of the body were effused on their health by consuming poultry meat.

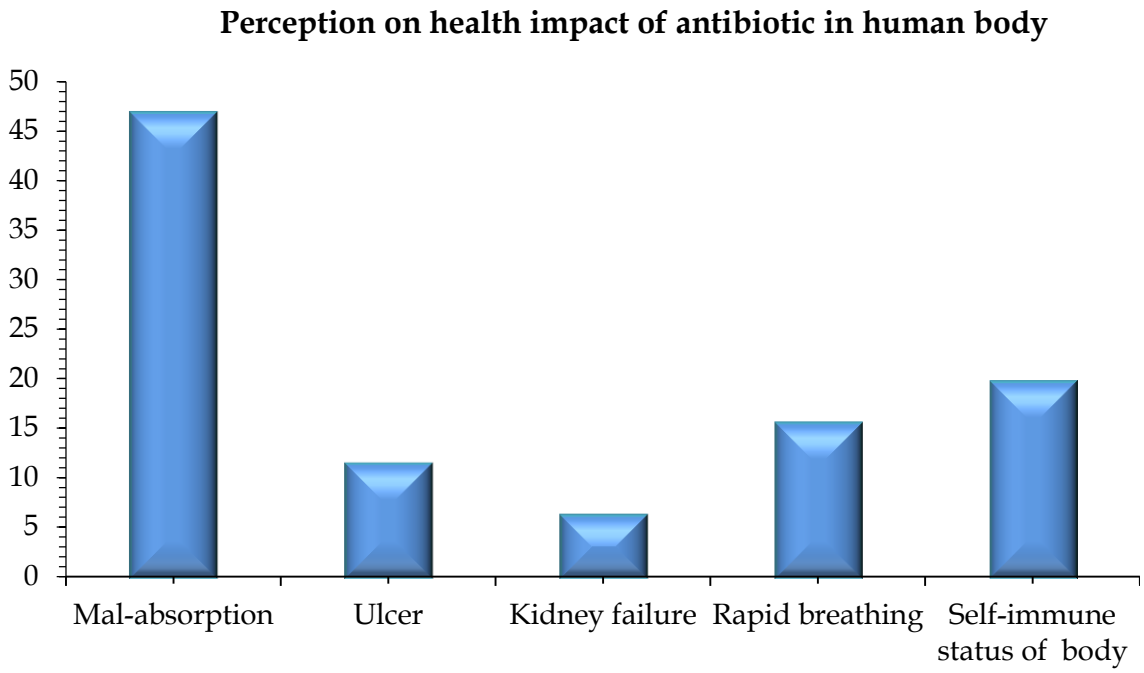

Figure 2: Health impact of antibiotic

Table 3: Antibiotics and other important issues related information

Parameters	Categories	Frequency (N)	Percentages (%)
Knowledge about antibiotics	Yes	55	56.12
	No	43	43.88
Adding of chemicals, heavy metals, stones to poultry feed	Yes	73	74.49
	No	25	25.51
Injurious effect of antibiotics to poultry health	Yes	34	34.69
	No	64	65.31
Antibiotics used as preventive dose	Yes	34	34.69
	No	64	65.31
Antibiotics used as therapeutic dose	Yes	83	84.69
	No	15	15.31
Antibiotics used in ready feed	Yes	31	31.63
	No	67	68.38
Antibiotics used in drinking water	Yes	68	69.39
	No	30	33.61
Used antibiotic to cure the disease	Yes	86	87.75
	No	12	12.24

From this survey, table 3 showed that 55 (56.12%) respondents had known about antibiotics. Majority 73 (74.49%) farmer's said that they bought poultry feed in which different type of chemicals, heavy metals, stones etc. were added. Over one third 34 (34.69%) respondents thought that antibiotics added feed had injurious effect to poultry health. Here, 34 (34.69%) farmers were used antibiotic as preventive dose. A great majority 83 (84.69%) farmers were used antibiotic as therapeutic dose. About seventy 68 (69.39%) farmers were used antibiotics in drinking water. Almost 86 (87.75%) farmers believed that used antibiotics cure the disease.

Table 4 represents that majority 86 (87.75%) of subjects were used broad-spectrum antibiotics and 90 (91.83%) subjects were used narrow-spectrum antibiotics. Among all antibiotics, almost 41 (41.83%) farmers used Ciprofloxacin, mostly 24 (24.49%) had used Colistin sulphate, 17 (17.35%) used Enrofloxacin. In my study I found that, 2nd generation antibiotics were used by over half 54 (55.10%) farmers. Prior 1st week complete, maximum (62.24%) farmers used antibiotics in broiler.

Table 4: Antibiotics uses history

Parameter	Categories	Frequency (N)	Percentages (%)
Broad-spectrum antibiotic Use	Yes	86	87.75
	No	12	12.24
Narrow-spectrum antibiotic Use	Yes	90	91.83
	No	8	8.16
Repeatedly used antibiotics	Ciprofloxacin	41	41.83
	Enrofloxacin	17	17.35
	Colistin suphate	24	24.49
	Doxycycline	16	16.33
Types of antibiotic generation	1st generation	15	15.31
	2nd generation	54	55.10
	3rd generation	24	24.49
	4th generation	5	5.10
Age of antibiotics used	Prior 1st week complete	61	62.24
	After 2nd weeks more	20	20.41
	At 3rd weeks more	17	17.35

According to this survey figure 3 shows that farmers used antibiotics due to registered vet doctor's prescription were more than one third 48 (48.97%). Majority 70 (71.43%) from non-registered vet doctor's prescription, Farmers used about seventy 70 (71.43%) antibiotics due to suggestion by representatives of any feed company and mostly 43 (43.88%) respondents were used antibiotics by their own decision.

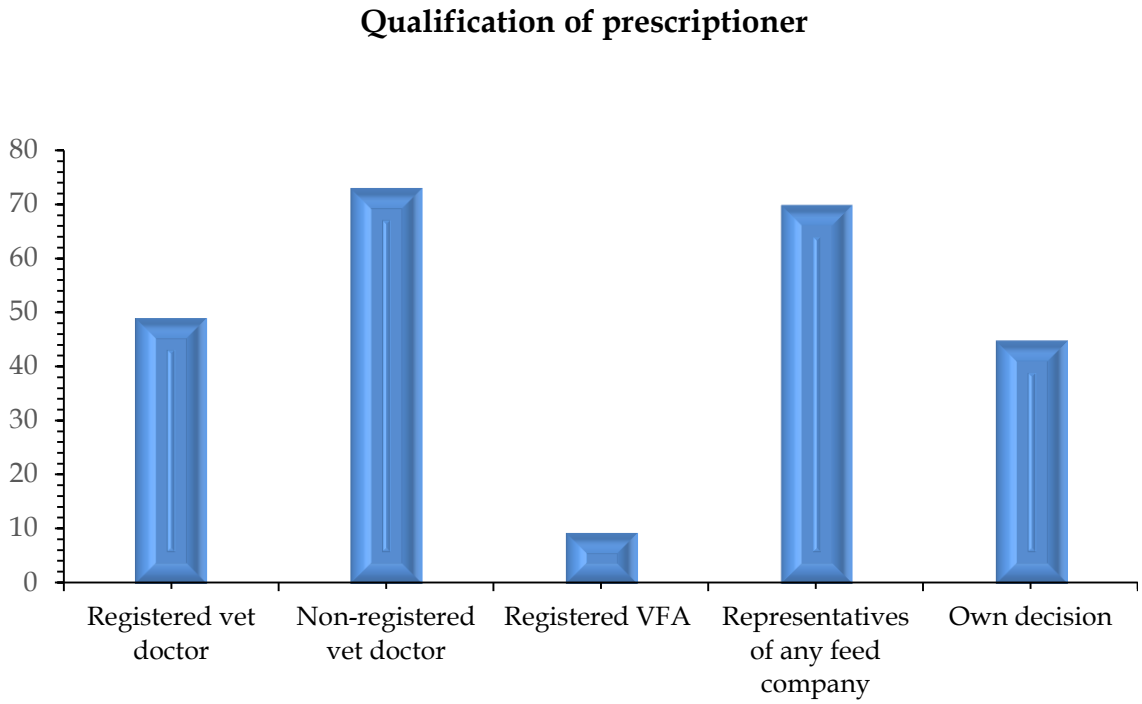

Figure 3: Prescriptioner's information

Here, table 5 shows that only 9 (9.18%) respondents had known about the withdrawal period of antibiotic. Almost 87 (88.77%) of subjects had no idea about residual effect. Few number of 11 (11.22%) farmers had knowledge about the side effect of antibiotics. A great majority 87 (88.77%) had no idea about normal dose of antibiotics. More than three fifth 61 (62.24%) respondents said that human health hazard could be occurred due to consume poultry products that have prolonged use of antibiotics. Only 8 (8.16%) respondents had idea about antibiotic resistance. Maximum 76 (77.55%) farmers thought that most of the time antibiotics were needed.

Table 5: Farmer perception about antibiotics

Parameter	Categories	Frequency(N)	Percentage(%)
Knowledge about withdrawal period	Yes	9	9.18
	No	89	90.82
Idea about residual effect	Yes	11	11.22
	No	87	88.77
Knowledge about side effect	Yes	11	11.22
	No	87	88.77
Idea about normal dose	Yes	11	11.22
	No	87	88.77
Health hazard due to consume poultry products	Yes	61	62,24
	No	37	37.75
Idea about antibiotic resistance	Yes	8	8.16
	No	90	91.84
Farmer's conception on antibiotics need	Always	3	3.06
	Mostly	76	77.55
	Sometimes	12	12.24
	Never	7	7.14

This study explores use pattern and awareness on antibiotics among the broiler farmers. It is found 89.00% of farmers used antibiotics within last 3 months. Majority (55.10%) of them used 2nd generation antibiotics. More than half 55 (56.12%) respondents were known about antibiotics. Majority 64 (65.31%) farmer's had no knowledge about harmful effect. Maximum (62.24%) farmers used antibiotics in broiler when age of birds were prior 1st week complete. More than one-third 49 (49%) used antibiotics according to the registered vet doctor's prescription. Forty three farmers took self-decision for antibiotics use (43.88%). Majority 47 (47.96%) thought that mal-absorption was the main side effect of antibiotics residue. Most of the (41.83%) participants used Ciprofloxacin, 17.35% used Enrofloxacin, 24.49% used Colistin sulphate and only 16.33% used Doxycycline in last 3 months.

Extensive antibiotics use has led to develop bacterial antibiotic resistance over the years (Apata, 2009). This study showed more than four of five farmers used antibiotics within last 3 months in the farm. It was all (100%) in Ogun State, Nigeria (Oluwasile *et al*.,2014) and Songkhla province, Thailand (Lampang *et al*.,2007). Widespread use of antibiotics could have negative implications for human and animal health and the environment (Hasan *et al*., 2014).

In the research majority 83 (84.69%) of farmers used antibiotics within last 3 months for therapeutic purpose and (34.69%) farmers used antibiotics for preventive purpose. It was much lower at 21 (36.2%) for treatment and only 17 (29.3%) prophylactic purpose was in Ogun State, Nigeria (Oluwasile *et al*., 2014).

In the research findings, it was found that majority 54 (55.10%) of farmers used 2nd generation antibiotics, similar result were found in Pakistan where 2nd generation antibiotics such as norfloxacin and enrofloxacin were extensively used (Anjum and Rizvi, 1998).

In this study, more than one-third 49 (49.0%) used antibiotics according to registered vet doctor's prescription. Farmers took self-decision for antibiotics use was 43 (43.88%). Previous study in Ogun state were noted that 29 (50%)

poultry farmers took antibiotics according to the prescription of veterinary doctors 25 (43.1%) farmers took self-decision for antibiotics use in their farm (Oluwasile *et al*., 2014). Okoli *et al.,* (2002) and Okoli *et al.,* (2005) who reported that about half of the poultry farms practices self-medication in south eastern, Nigeria and this were also reported by Kwaga and Adesiyu, (1984) that antimicrobial agents are readily available for the people without prescription. Access to antibiotics was not restricted as farmers could purchase any drug from retailers without prescription. Incorrectly prescribed antibiotics also contribute to the promotion of resistant bacteria. Study results indicated that 30% to 60% of prescribed antibiotics are unnecessary, inappropriate, or suboptimal (Bergmans *et al*., 1997; Kollef and Frasen 2001). Overprescribing and misprescribing antibiotics are undoubtedly contributing to the growing challenges posed by antibiotic-resistant bacteria, and epidemiological studies were clearly demonstrated direct relationships between antibiotics consumption and the emergence and dissemination of resistant strains (Kollef and Frasen, 2001).

Antibiotics residue in poultry production can actually have adverse impact on human health (Mehdi *et al*., 2018). In this study, majority 45 (46.9%) thought that mal-absorption was the main side effect of antibiotics residue while 19.8% farmers said that another side effect of antibiotics residue was poor self-immune status of the body. In the poultry farm of Pakistan, it was reported that about half of gastro-intestinal symptoms were caused through intake of antibiotics. Also cutaneous eruptions, dermatitis and anaphylaxis in humans are the residual effect of ingestion of antibiotics containing poultry products. Moreover, penicillin residues in poultry can lead to severe anaphylactic reactions while eggs containing residues of antibiotics cause skin allergies upon consumption (Mund *et al*., 2016).

In the survey work, different types of antibiotic usage were observed among the poultry farms. Mostly (41.83%) participants used Ciprofloxacin, 17.35% Enrofloxacin, 24.49% Colistin suphate and only (16.33%) used Doxycycline in

last three months. In Bangladesh it was found that, Colistin Sulfate (30.14%) was main drug choice followed by Doxycycline (20.6%), Ciprofloxacin (19.2%), and Enrofloxacin (19.2%) (Islam *et al*., 2016). In Ogun state, Colistin sulphate (36.2%), Enrofloxacin (27.6%) and Furazolidone (20.7%) were the commonest antibiotics used in the study area. (BB Oluwasile *et al*., 2014). Another study shown that in a broiler farms of Songkhla province, Southern Thailandthe, most frequently used being the combination of amoxicillin-enrofloxacin (21.18%) (Lampang *et al*., 2007).

The socio-economic characteristics of the respondents (farmers) showed that 91.84% of the farmers were males. Also, the average age distribution of the farmers were 35 years and they also had previous farming experience, 54.08% had less than equal 5 years of experience. Because of the average age of farmers was 35 years, implying that the majority of the farmers in the areas were youth. This indicates that the respondents were in physically active stage that could drive agricultural productivity in the field if supported. From their previous farming experience they can improve their farming system. In West Cameroon, men (90%) with average 36 years involved in breeder's farm and 46% had less than 5 years of experience (Fouepe *et al*., 2017). It was found that majority 38 (38.77%) were primary educated. In Nigeria, it was almost similar (33.75%) according to Ajewole *et al*., (2014). In Oyo state, Nigeria, a higher percentage (92.7%) of the poultry farmers became aware of the recommended practices through Radio and (90.3%) from Television while a very few (18.9%) were aware of the practices through veterinary doctor and feed millers (Oyeyinka *et al*., 2011). But in this study it was found that to develop the public awareness message would be provided from the source of electronic and printing media, daily newspaper, facebook. Also television (54.08%) and radio (22.45%) play very important roles for the source of information that found by our study. In this survey it was found that biosecurity measures were very crucial in the poultry farms. Of the various types of safety tools enlisted, about 40 (40.82%) of the farmers were used only disinfectants and (27.55%) had used water purifier. However, only (8.16%) farmers wear hand gloves and (9.18%) wear farm cloths

as safety tools against germs. Poultry farms were in and around Debre markos, amhara region and Ethiopia, more than three fifth (63.3%) of the producers dressed on protective cloth and only (8.2%) of the producers wear hand gloves. About 77.6% of the producers used the foot path in front of their farm entrance (Yitbarek *et al*., 2016).

Lastly antibiotics were widely used on all farms participating in this study and all interviews and observations indicated that antibiotic practices were uncontrolled. It was reported that contributed to antibiotics use and concerns that were raised by participants about antibiotics use in food animals.

This study was not free of limitations. Only interested farmers within the fixed selected areas were interviewed. This may narrows its generalization. Lack of knowledge on asking question of participants provide some information bias in this study. Although question were discussed clearly with the farmers increase the reliability of the results.

CHAPTER V

SUMMARY AND CONCLUTION

CHAPTER V

SUMMARY AND CONCLUSION

This study provided information on use of therapeutic antibiotics in broiler. Antibiotics were mainly used in therapeutics purpose by the broiler farmers. The main choice of therapeutic drugs by the farmers were Ciprofloxacin, Colistin Sulphate and Enrofloxacin. Most of the farmers choose 2nd generation antibiotics. Almost half of the farmer bought as per antibiotics with registered vet doctor's advice but more than one third of the farmers took self-decision for antibiotics use. Majority of farmer's had no knowledge about residual effect and resistance of antibiotics. A vast majority of poultry growers had no idea about antibiotic resistance. It was found that the main problem of poultry industry is a lack of knowledge of farmers. Biosecurity measures were very much unsatisfactory level in the poultry farms. Education for prudent use of antibiotics in food animals and regulations are urgently needed. Findings of this study will contribute to the development of strategies for prudent use of antibiotics in the broiler industry of Bangladesh.

CHAPTER VI

REFERENCES

CHAPTER VII

REFERENCES

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APPENDICES

APPENDICES

Appendix 1: Demographic characteristics of farmers in three district of Bangladesh

Parameters	Categories	Frequency (N)	Percentages (%)
Gender	Male	90	91.84
	Female	8	8.16
Living place	Rural	78	79.59
	Semi Urban	20	20.4
Religion	Muslim	82	83.67
	Hindu	16	16.33
Education	Illiterate	12	12.24
	Primary	38	38.77
	Secondary	33	33.67
	Higher secondary and above	15	15.31
Occupation	Only Farmer	60	61.22
	Farmer and others	38	38.77
Experience	≤ 5	45	45.91
	>5	53	54.08
Family member	≤ 4	28	28.57
	>4	70	71.43
Family income	5500-8000	11	11.22
	8000-10000	25	25.51
	10000-15000	39	39.79
	16000-20000	17	17.35
	21000-Above	6	6.12

Appendix 2: Farming system and hygienic status of farm

Parameters	Categories	Frequency (N)	Percentages (%)
Farms type	Close	82	83.67
	Intensive	16	16.33
Litter types	Sawdust	34	34.69
	Rice husk	63	64.28
	Sand	1	1.02
No. Of Birds	500-1000	67	68.37
	1500-2000	21	21.43
	2000-5000	7	7.14
	5000-Above	3	3.06
Mortality	Less than ten	35	35.71
	More than ten	23	23.47
	More than twenty	40	40.82
Use of protective tools	Yes	91	92.86
	No	7	7.14
Safety tools	Disinfectants	40	40.82
	Water Purifier	27	27.55
	Hand gloves	8	8.16
	Farm cloths	9	9.18
	Farm shoes	14	14.28

Appendix 3: Farmers belief of problem and sources of awareness to solve the problem

Parameters	Categories	Frequency (N)	Percentage(%)
Lack of knowledge	Yes	47	47.96
	No	51	52.04
Corrupted syndicate in the market	Yes	15	15.31
	No	83	84.69
Lack of government awareness	Yes	25	25.51
	No	73	74.49
Scarcity of technical persons	Yes	9	9.18
	No	89	90.82
Best way to get awareness	Television	53	54.08
	Radio	22	22.45
	Newspaper	10	10.2
	Facebook	13	13.26

Appendix 4: Health impacts of antibiotic

Parameters	Categories	Frequency(N)	Percentage(%)
Knowledge about harmful effect of antibiotic on poultry	Yes	34	34.69
	No	64	65.31
Human Health impact	Mal-absorption	47	47.96
	Ulcer	11	11.22
	Kidney failure	6	6.12
	Rapid breathing	15	15.31
	Self-immune status of body	19	19.39

Appendix 5: Antibiotics and other important issues related information

Parameter	Categories	Frequency (N)	Percentages(%)
Knowledge about antibiotics	Yes	55	56.12
	No	43	43.88
Adding of different chemicals, heavy metals, stones etc.	Yes	73	74.49
	No	25	25.51
Injurious effect of antibiotics to poultry health	Yes	34	34.69
	No	64	65.31
Antibiotics used as preventive dose	Yes	34	34.69
	No	64	65.31
Antibiotics used as therapeutic dose	Yes	83	84.69
	No	15	15.31
Antibiotics used in ready feed	Yes	31	31.63
	No	67	68.38
Antibiotics used in drinking water	Yes	68	69.39
	No	30	30.61
Used antibiotic cure the disease	Yes	86	87.75
	No	12	12.24

Appendix 6: Antibiotics uses history

Parameter	Categories	Frequency(N)	Percentage(%)
Broad-spectrum antibiotic Use	Yes	86	87.75
	No	12	12.24
Narrow-spectrum antibiotic Use	Yes	90	91.83
	No	8	8.16
Repeatedly used antibiotics	Ciprofloxacin	41	41.83
	Enrofloxacin,	17	17.35
	Colistin suphate	24	24.49
	Doxycycline	16	16.33
Types of antibiotic generation	1st generation	15	15.31
	2nd generation	54	55.10
	3rd generation	24	24.49
	4th generation	5	5.10
Age of antibiotics used	Prior 1st week complete	61	62.24
	After 2nd weeks more	20	20.41
	At 3rd weeks more	17	17.35

Appendix 7: Prescriptioner Information

Parameter	Categories	Frequency (N)	Percentages (%)
Antibiotics used due to registered vet doctor's prescription	Yes	48	48.97
	No	50	51.02
Antibiotics used due to govt. registered vet doctor's prescription	Yes	63	64.28
	No	35	35.71
Antibiotics used due to non-registered vet doctor's prescription	Yes	70	71.43
	No	28	28.57
Antibiotics used due to registered VFA vet practitioner suggestion	Yes	10	10.20
	No	88	89.79
Antibiotics used due to suggestion by experienced quack practitioner	Yes	19	19.39
	No	77	78.57
Antibiotics used by dealer of feed company	Yes	71	72.45
	No	27	27.55
Antibiotics used due to suggestion by representatives of any feed company	Yes	70	71.43
	No	28	28.57
Antibiotics used due to own decision	Yes	43	43.88
	No	55	56.12

Appendix 8: Farmer perception about antibiotics

Parameter	Categories	Frequency(N)	Percentage(%)
Knowledge about withdrawal period	Yes	9	9.18
	No	89	90.82
Idea about residual effect	Yes	11	11.22
	No	87	88.77
Knowledge about side effect	Yes	11	11.22
	No	87	88.77
Idea about normal dose	Yes	11	11.22
	No	87	88.77
Health hazard due to consume poultry products	Yes	61	62.24
	No	37	37.75
Idea about antibiotic resistance	Yes	8	8.16
	No	90	91.84
Farmer's conception on antibiotics need	Always	3	3.06
	Mostly	76	77.55
	Sometimes	12	12.24
	Never	7	7.14