



Uses of Amoxicillin Antibiotic in Poultry Industries: Benefits and Challenges



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Abstract

Antibiotic residue is one of the major public health concerns in the present world. The antibiotic residues above the maximum residue limit are considered harmful and hazard to human health. The indiscriminate use of antibiotics in poultry industries can lead to residues in poultry products & byproducts. The major public health significances of antibiotics residues on humans by directly causing diseases such as hypersensitivity reaction, carcinogenicity, mutagenicity, teratogenicity, bone marrow depression, and disruption of normal intestinal flora and indirect harm via antibiotic resistance. Several antibiotics are used in poultry industries of which amoxicillin is mostly used to prevent bacterial infection. Amoxicillin is a wide spectrum β -lactam antibiotic, used to treat bacterial infections caused by susceptible microorganisms. Because of its broad spectrum activity better absorption following oral administration it is most commonly used in poultry production. Our study indicated that amoxicillin antibiotic in poultry industry is safe if use judiciously; however, majority of poultry farmers in Bangladesh is illiterate or poorly literate without having judicious knowledge of antibiotic use. Licensed practitioners and Veterinary personnel can combat the unwanted problem that comes from the antibiotics residues and resistance to public health hazards. Regular surveillance study, monitoring, awareness campaign and legislation on antibiotic uses in poultry industry are essentially needed to overcome the rising and existing problem. From amoxicillin study in poultry we can conclude that judicious use of this important antibiotic in poultry production is urgently needed to avoid antibiotic residue and subsequent public health concern aroused from amoxicillin antibiotic residue. It is to be noted that short administration (2-4 weeks) of amoxicillin antibiotic did not influence the hematological parameter in our study.

Keywords: Amoxicillin; Antibiotic residue; Public health

The role of antibiotic (Amoxicillin) in poultry production

Antibiotic therapy has great importance in human and veterinary medicine [1] and widely used in poultry industry to improve growth rates, health, feed efficiency, egg production and for therapeutic reasons & prophylaxis measures to reduce the incidence of poultry diseases [2]. Amoxicillin is a broad-spectrum, pharmacologically active beta-lactam antibiotic used extensively for treatment bacterial infection in poultry industries [3]. Antibiotic also used as a growth promoter and increase growth and feed efficiency in poultry [4]. Growth promoters are antimicrobials which, when administered in low doses in animal feed, have a preventive effect against certain bacterial infections and modify the composition of the intestinal microbes, improving feed assimilation. The impact of these protective effects on animal production is to accelerate poultry production [5]. Indiscriminate

use of antibiotic in poultry farms is responsible for residual deposition in broiler's edible tissue that can possess health hazard including antibiotic resistance to human being by entering in food chain [6]. So, use of antibiotic in poultry production is not harmful except indiscriminate and irrational use.

People Knowledge and awareness to Antibiotic residue

Antibiotic residues are the parent compounds, their metabolites, and associated impurities of veterinary drugs in any edible portion of an animal product result in the public health hazard [7]. But, majority of the people in Bangladesh is still not fully aware about the health hazards of antibiotic residues. A few poultry farmers were found well educated about health hazards of antibiotic residues and aware about the judicious use of antibiotics before selling the poultry for human consumptions [8]. So, creating awareness among poultry farmers and producers

about the antibiotic residue and withdrawal is an important tool to mitigate antibiotic residue in poultry product and byproduct.

Amoxicillin and its Discriminate and Indiscriminate use

a) The most commonly used antibiotics in poultry industries are tetracycline, gentamicin, neomycin, tylosine, erythromycin, virginiamycin, ceftiofur, bacitracin, flouroquinolones and/or quinolone, sulfonamide, oxytetracycline, amoxicillin, amprolium, ciprofloxacin and sulfa drugs [9]. We used these antibiotics in differ research experiment either discriminately or indiscriminately or both and in this review we focused on amoxicillin because of its frequent used in poultry industries.

b) The body weight gain was significantly highest in indiscriminate use compared with control and discriminate use in every cases, which indicate growth promoting effect of amoxicillin antibiotic.

c) Thin Layer Chromatography (TLC) analysis indicated that indiscriminate uses of amoxicillin in poultry deposited antibiotic residues in different edible tissues. So, indiscriminate use is a matter of concern and should not be allowed for human consumption. On the other hand, TLC analyses in control and discriminate use indicated safe products due to decreased intensity of the amoxicillin residue.

d) There was no significant difference on blood parameter (hemoglobin (%), Packed cell volume, Total erythrocyte count) following discriminate and indiscriminate use and need long term exposure of antibiotic for significant change [10].

Conclusion

The amoxicillin residue in poultry edible tissue is really a matter of concern. Indiscriminate and irrational use of amoxicillin in poultry without following withdrawal period may result in unexpected residues in animal food and could cause serious health hazards to consumers. Hence, the withdrawal time of drugs should be strictly followed and meat and other animal products like liver and kidney should not be used for human consumption. Use of amoxicillin as growth promoter should be

strictly prohibited and whenever they are used for therapeutic purpose must be used in proper doses and for proper time. Thus, by observing proper scientific guidelines and precautions we can minimize the harmful effects of antibiotic residues. The policy makers and government authority should take proper legislation to stop this antibiotic residue that would eventually help the well-being of human through consumption of poultry meat.

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