

Natural antibiotic effect of turmeric in poultry management

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Abstract

Maintaining poultry without antibiotics increases the rate of mortality in poultry. It has been stated that the supplementation of antibiotics in regular diet reduces the morbidity and mortality, as well as overall growth of broiler chickens. Using these commercially available antibiotics may show it adverse effect on the public health by developing the antibiotic resistant micro flora. Considering this harmful effect, many developed countries have made it legally not to use in-feed antibiotics. Poultry industry needs to develop an alternative method to provide antibiotic potential to the chickens, in order to enhance the rate of production. It is reported recently that turmeric falls in such class of medicinal plant that provides an alternative method of natural antibiotic to feed poultry farm. Turmeric supplementation could effectively acts on growth, egg production and health status of chickens.

Keywords: Turmeric; Poultry; Antibiotics; Anti-inflammation;

Introduction

Over the decade the commercially available antibiotics have been used in poultry feed to provide supplementary support to fight against harmful exogenous pathogens [1]. These antibiotics helps to overcome with the morbidity and mortality issues with poultry farming, however can affect the public health by developing drug resistant micro flora [2]. It is reported that the use of antibiotics in poultry diet was completely banned in European countries since January 2006 [2]. In order to avoid the use of antibiotics, it is necessary for industries to find required alternatives to supply the feed for poultry [3]. Various bioactive products are tested in the diets without antibiotics in order to maximize the health quality of poultry [1, 3]. Turmeric (*Curcuma longa*), a domestic spice has the various applications in the medicinal biology [4]. Turmeric produces a specific bioactive compound called curcumin, a polyphenolic phytochemical with anti-microbial, anti-inflammatory, anti-cancerous and anti-oxidant properties [4, 5]. The recent reports have been suggested that the efficacy of turmeric in poultry feed in order to replace antibiotics use [1]. It has been found that the feeding of turmeric rhizome powder in the poultry diet helped to improve the morbidity and mortality of broiler chickens [6]. It is also proven that the use of turmeric in poultry feed is helpful for the public health with no side effects [1].

Importance of turmeric use in poultry feed

The rhizome of turmeric is the rich source of bioactive compounds used non-medicinally as a spice and medicinally as human remedies [7]. When compared with the commercially available antibiotics, turmeric is of natural, non-toxic and an ideal food additive usually used in the regular diet [7, 8]. Turmeric is consisting of 69.4% carbohydrates, 6.3% protein, 5.1% fat, 3.5% minerals and 13.1% moisture [9]. It is also a rich source of phenolic compounds, such as curcumin, demethoxycurcumin, and bisdemethoxy curcumin and tetrahydrocurcumin metabolites [10, 11]. This polyphenilic compound has the wide range of biological properties such as antioxidant, antibacterial, antiviral, antifungal, antihypertensive, anti-inflammatory, and anti-carcinogenic activities [12, 13]. It is reported that the supplementation of turmeric meal effectively enhanced the growth rate and weight of broiler chickens [14]. Turmeric supplementation stimulates the digestive system by promoting the intestinal lipase, maltase, and sucrose activities as well as the secretion of pancreatic amylase, lipase, chemo trypsin and trypsin [15, 16]. Turmeric also has its positive approach on egg production; there are evidences to prove effect of turmeric meal in the stimulation of egg production in hens [17]. Dietary supplementation of turmeric was involved in the increased production of eggs and increased yolk weight and yolk index as well [17].

Effect of turmeric on the health status of broiler chickens

Supplementation of turmeric could effectively control the hematological parameters in broiler chickens [18]. Literatures on fat metabolism using male chickens have shown that the consistency in the stimulated activity of hormone sensitive lipase (HSL) and involved in the increase of high density lipoprotein (HDL) in the serum [19]. Turmeric is also involved in the regulation of total cholesterol, total triglycerides and very low-density lipoprotein (VLDL) levels in the blood serum [19]. It is also reported that the involvement of turmeric in the regulation of serum lipid profile [9]. Turmeric is an efficient dietary supplement attributes in the stimulation of bile secretion and bile flow, which used to maintain the liver health [19]. Turmeric is also involved in the regulation of alkaline phosphatase (ALP) and lactate dehydrogenase (LDH) in the broiler chickens blood [19].

The immunomodulatory effects of turmeric extensively boost the ability of immune system, which provides instant natural antibiotic capability against invading pathogens [20]. Turmeric can specifically regulate the inflammation, which is very important to prevent the progression of inflammation induced pathology in poultry [4, 20]. It also known for its cellular repair mechanism, the administration of turmeric involved in the repair of lymphocytes

in the lymphoid organs [21]. Turmeric is already well known for its safe and natural phyto-biotics action [8]. The world Health Organization (WHO) has declared turmeric as a safest dietary element to be used in human diet as well as in animal feed [22]. It is also very important to notice that there are no publications yet that is reporting the adverse effects of turmeric meal on poultry diet when used at moderate concentrations [1].

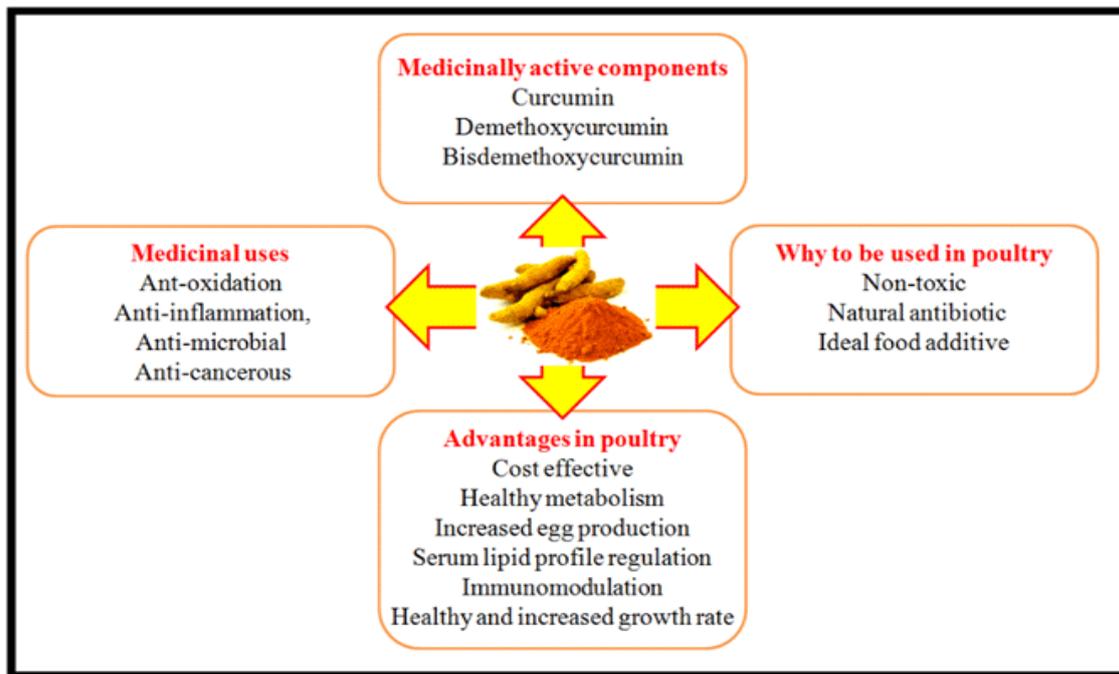


Figure 1: Advantages of turmeric in poultry. Turmeric is a naturally available potent medicinally important phyto-product mainly used in regular diet and traditional medicines. Updated knowledge about the active components of turmeric and its advantages in the poultry is represented graphically.

Conclusion

The literatures suggest that turmeric could be a useful alternative for antibiotics in poultry farm due to its wide range of biochemical activities. The scientific action of turmeric meal promotes the growth performance and weight gaining in poultry. This action may attribute with the overall health status, metabolic system, immunomodulation and antimicrobial action. Though, there only few literatures are available to suggest the mode of action of turmeric in poultry, more research should be undertaken in future to focus on mechanism of action of curcumin to provide strong support to use turmeric in poultry industry.

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