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A review on the effects of neem (*Azadirachta indica*) as feed additive in poultry production

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Abstract

The use of herbs and medicinal plants to feed poultry has recently been used as a safe and natural material to stimulate the immune system, treating diseases or using them as catalysts of growth and thus positive impact on the productive performance of poultry. Recent reports have indicated that the use of antibiotics is prohibited many countries due to adverse effects on the health of the consumer as a result of the survival of the residues of these antibiotics in the tissues of the bird's body.

The active compounds found in the Neem plant have a wide and varied effects on human health as it is considered anti-bacterial, viruses, malaria, infections and antioxidants.

The main objective of this study is to review the research currently under way on the Neem plant, which is one of the most important medicinal and herbal plants.

Keywords: Additive, Neem, poultry, performance

1. Introduction

1.1 Neem tree (*Azadirachta indica*)

Neem is a perennial tree, neem is a native of India but it is also found in a number of countries in south east India. It has a smell of garlic and bitter taste. The neem tree is known to the Indians as the village pharmacy because of their vulnerability in the healing of wounds and used in ancient Indian medicine for more than 4000 years because of their natural useful old, thanks to the natural characteristics ^[1-3]. Neem tree is an evergreen Tropical tree, its scientific name is *Azadirachta indica*.

It is considered one of the most important dry areas trees that could grow in dry lands and poor areas with nutrients elements they are also fast-growing evergreen trees and growing densely ^[4]. The height is up to 16 m and sometimes reaches 25 m, and the diameter of a total vegetative to 10 m which is a tree that is characterized by the large size of its roots as the roots extend to large area incidentally Therefore, when planting trees neem must leave spaces between each tree and another not less than 3 m ^[5], the neem tree is character a solid hard trunk, dark brown with a cracked brown crust of between 75 and 150 cm the leaves are gathered at the ends of the branches. The length of the leaf is 30 cm, the leaves are composed of an of opposite leaflets of up to 17 Leaflet, The side flora are numerous flowers up to 20 cm long. The flower aromatic and white, and the fruit is as long as one centimeter. It is green and turns to yellow when it ripens and with one seed bitter taste ^[6, 7].

1.2 Chemical composition of neem

Neem leaves are chemically composed of proteins, fibers, ether, ash and other compounds, Bonsu *et al*, ^[8] showed that neem leaves contain Crude protein 15.8%, Crude fiber 14.6%, Ether extract 8.5%, Ash 4.5%, Moisture 13.0% and NFE 56.6%, These percentages vary from one place to another due to variations in nutrient composition of the soil where the neem plant is grown.

1.3 Medicinal Properties of Neem (*Azadirachta indica*)

Neem leaves contain anti-microbial compounds ^[9, 10], Anti-inflammatory, anti-hyperglycaemia, anti-ulcer, anti-malaria, anti-fungal, anti-virus, and antioxidants ^[4], One of the most important items in the neem is Sodium nimbidate, which is anti-inflammatory and substance Nimbidin which is anti-arthritis, reduce blood sugar and treat stomach ulcer ^[11, 12].

The seeds of the neem plant contain Azadirachtin which is considered as anti-malarial substance ^[13], Seed oil contains Nimbolide,

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Gedunin and Mahmoodin which are anti-bacterial and bacteriological, The researcher also noted that the plant neem bark contains Polysaccharides and Polysaccharides GIIIaGIIa, as an anti-inflammatory and Polysaccharides GIa, GIb is an anti-cancerous tumors, The injection of the neem leaves extract on solid cancerous tumors reduces the risk of the spread of the disease, as well as the limit of its growth, especially skin cancer which responds very well to the treatment of neem [14]. It also contains the NB-II Peptidoglycan that increase the immunity of the body as the neem stop the increasing numbers of AIDS virus by discouraging protein P24 produced by the virus, in order to increase the number of this virus in the body and then decreasing the number virus in the body of the patient. The leaves of the neem tree extract could be used as a treatment stung by pests, burns, skin diseases and infections. Neem oil also prevents the proliferation of fungi on the skin of human and animal [15, 16]. Insulin Injection in some diabetics may not have been the best way to treat diabetes, therefore, insulin injection can be replaced gradually by taking one of the neem products in the form of tablets or capsules or oil that enables the reduction of insulin doses to a minimum 50% and lowers the level of glucose in the blood by 26% [17, 18].

1.4 Effect of neem on the performance of poultry

Durrani *et al* [19] referred significant improvement in the average OF body weight when the neem leaves powder was added to drinking water by 50 ml/l, These result were consistent with Onyimonyi *et al* [20], as showed significant improvement in the average of body weight and body weight gain when adding neem leaves powder to broiler diet at a rate of 0.5%, These results are consistent with Wankar *et al* [21] they showed significant improvement in the average of body weight when adding neem leaves powder to broiler diet at a rate of 1, 2, 3 gram/kg. These results are not consistent with Landy *et al* [22], they showed a significant decline in the average of body weight when adding a powder neem leaves at a rate of 7 and 12 grams / kg to broiler diet at age of 42 day, the reason for this may be to bitter taste for neem. These results are not consistent with Singh *et al* [23], as they noting significant improvement in the body weight gain when adding neem leaves powder to the layer diet at a rate of 1, 2 and 3 grams / kg, These result are consistent with Shihab *et al* [24] they found significant improvement in the average of body weight and feed intake when adding neem leaves powder to broiler diet at a rate of 2 grams / kg. However, birds supplemented with neem leaf powder had higher body weight, weekly gain in weight, feed consumption. These results may be due to antimicrobial and anti-protozoal properties of neem, which help to reduce the microbial of birds and improved the feed consumption of the birds [6]. Durrani *et al* [19] observed significant decrease in the amount of feed intake and water intake when adding a powder neem leaves to drinking water, This results do not Consistent with the Landy *et al* [22], they founded that there were no significant differences between treatments in feed intake when adding a powder neem leaves at a rate of 7 and 12 grams / kg to broiler diet at age of 42 day, also Singh *et al* [23], depicted that there were a significant differences between treatments in the feed intake when adding neem leaves powder to the layer diet at a rate of 1, 2 and 3 grams / kg. Durrani *et al* [19] founded significant improvement in relative weight (liver, heart and gizzard) when adding the neem leaves powder to drinking water by 40 ml/l, These results are not consistent with Kharde and Soujanya [25] they founded that there were no significant differences between

treatments on carcass parameters (heart, gizzard and liver) when adding the neem leaves powder to broiler diet at a rate of 1,2 grams / kg and 0.5, 1 grams / kg garlic powder. These results are not consistent with Shihab *et al* [24] they founded that there were no significant differences between treatments in relative weight (liver, heart and gizzard) when adding the neem leaves powder to broiler diet at a rate of 2 grams / kg. Obikaonu *et al* [26] observed significant decrease in the concentration of cholesterol, glucose, alanine aminotransferase (ALT) and Aspartate Aminotransferase (AST)) when adding the neem leaves powder to broiler diet at a rate of 2.5, 5, 7.5 and 10%, while there were no significant differences between treatments in the total protein, calcium, and sodium, also Shihab *et al* [23] showed a significant improvement in the concentration of total protein, cholesterol, triglycerides, albumen, globulin and calcium when adding the neem leaves powder to broiler diet at a rate of 2 gm/ kg. Alam *et al* [27] observed that there were no significant differences between treatments in the hematological parameter (RBC, Hb, PCV, ESR) when adding neem leaves powder to broiler diet at a rate of 1, 2, 3 gram/kg.

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