



# Ocimum Sanctum, as Growth Promoter in Poultry



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## Abstract

The present mini review is based on the study of effect of *Ocimum sanctum* leaves powder/extract on body weight when supplemented to broiler chicken in feed/water. *O. sanctum* belongs to family lamiaceae and contains compounds such as carnosol, ursolic acid, rosmarinic acid, apigenin, eugenol, cirsilineol and cirsimaritin which are known to possess antioxidant properties. The reduced oxidative stress due to supplementation of this plant to broilers is found to enhance the growth rate and thus result in higher body weight.

**Keywords:** *Ocimum sanctum*; Tulsi; Body weight; Growth; Broilers; Chicken

## Introduction

Poultry farming is done at large scale throughout the world. They are raised for food both meat and eggs and are a source of income for a large part of our community. Growth and health are major concern in poultry farming. The motive of raising poultry is achieved only when they attain good growth in terms of muscles, and body weight. Now a days, use of herbal plants as growth promoters and as alternative medicine is increasing at a fast rate.

*Ocimum sanctum* belonging to family lamiaceae is widely known for its medicinal potentials. It is also known as Holy basil and Tulsi. It grows easily in the tropics and warm regions. It is distributed and cultivated widely throughout India. It is an erect, branched, fragrant plant which usually attains a height of about 30-60cm when mature. Different parts of this plant like leaves, seeds and stem are used in Ayurveda and Siddha Systems of Medicine for prevention and cure of many illnesses. Recent studies have revealed that feeding of *O. sanctum* leaves either in the form of powder or extract to broiler chicken enhances the growth rate and increases the body weight. The major growth promoters in the past were antibiotics but currently use of alternative herbal medicines is increasing as these are ecologically safe.

## Discussion

*O. sanctum* leaves can be fed in the form of dry powder mixed with feed or as extract mixed in water. Hasan et al. [1] evaluated that supplementation of *O. sanctum* leaf extract in water significantly increases the body weight of Cobb broilers

by 16.97% as compared to control group. Biswas et al. [2] also determined that broilers supplemented with *O. sanctum* leaves extract @1ml/liter in drinking water showed significantly higher body weight in comparison to control group. Alom et al. [3] concluded that supplementation of Tulsi leaves extract @2ml/liter drinking water of broiler results in significantly higher live body weight.

Similarly studies have shown that feeding of *O. sanctum* leaves dry powder have also resulted in significant increase in body weight of broilers. Singh et al. [4] reported that on feeding of *O. sanctum* leaf powder to broiler chicks @1 %level in feed, there is significant increase in muscle weight of breast, thigh, and legs resulting in higher body weight compared to control chicks. Mode et al. [5] demonstrated that feeding of *O. sanctum* dry leaves @3g/Kg feed for two weeks from 5<sup>th</sup> to 6<sup>th</sup> week to immune suppressed broiler birds protected the birds from immune suppression and they also achieved the required target by significant increase in their body weight gain. Gupta & Charan [6] observed that maximum weight gain was observed in-group of chickens treated with 200mg of dried leaves powder per bird daily for 15 days as compared to control group and at this dose level chicken had not shown any hematological, biochemical, histopathological, gross as well as clinical harmful effects. Kumari [7] reported the effect of Tulsi leaf powder fed @5g/kg feed on body weight gain in broilers experimentally infected with colibacillosis. It was noticed that body weight gain in *O. sanctum* leaf supplemented groups (infected as well as non-infected) was significantly higher as compared to their respective non-*O. sanctum* leaf supplemented control groups.

The increase in body weight of chicken fed *O. sanctum* could be due to antioxidant properties of the compounds found in Tulsi. When the oxidative stress is reduced than proper growth of body occurs resulting in more body weight. This is supported by Kelm et al. [8] who reported that *O. sanctum* contains a number of compounds (carnosol, ursolic acid, rosmarinic acid, apigenin, eugenol, cirsilineol and cirsimaritin), all of which have shown to have potent redox/anti-oxidant properties as well as anti-inflammatory activity. Siraji et al. [9] also reported that body weight in restrain stressed albino rats group was lower than in Tulsi treated group which might be due to hypophagia, altered secretion of various metabolic hormones and neuro transmitters, changes in membrane permeability & hypovolaemia resulting from stress induced secretion of corticosterone and epinephrine through hypothalamo-pituitary adrenal axis activation in stressed group.

There are studies which report that increase in body weight could be due to antioxidant effect of Tulsi. Reddy et al. [10] reported that dietary supplementation of Tulsi (*Ocimum sanctum*) leaf powder (0.5%) in broiler chickens enhanced the growth rate and there was significant ( $P<0.01$ ) increase in super oxidizedismutase and catalase levels in these broilers so as to combat the oxidative stress which was produced more during the rapid growth period. They further added that its combination with selenium (0.3ppm) enhanced the levels of these enzymes more effectively.

The antioxidant effect of *O. sanctum* is supported by many workers. Bharavi et al. [11] investigated that administration of herbal adaptive, *Ocimum sanctum* @0.1% through feed reversed the antioxidant enzymes of RBC such as superoxide dismutase and catalase, non enzymatic antioxidants glutathione and lipid per oxidation marker (TBARS) produced due to cadmium-induced oxidative toxicity in broiler chicken.

Sujatha et al. [12] conducted a comparative study on anti stressor and anti oxidative effects of synthetic vitamin C and polyherbal feed premix (containing *Phyllanthusemblica*, *O. sanctum* (leaves), *Terminalia chebula* (fruit), *Withania somenifera* (root) and Shilajit) supplementation in broilers during the summer months of June to July. After the 3<sup>rd</sup> week, mean plasma glucose, cholesterol and antioxidant enzyme glutathione reeducates (GSSG) were significantly ( $P<0.01$ ) lower in treated groups than control. Stress hormones namely cortisol and thyroxine (T4) were observed to be significantly ( $P\geq 0.05$ ) higher in the untreated controls than the treated groups. Thus, they concluded that oxidative stress in broilers during summer

could be ameliorated using antioxidant synthetic vitamin C and the poly herbal anti stressor, immune modulator and adaptogenic feed premix containing *O. sanctum*.

These studies clearly indicate that feeding of Tulsi leaf in broiler chickens accelerates growth response of the birds. The mechanism, by which growth is stimulated, is yet to be established from different aspects such as growth hormones, enzymes or other factors responsible for cell division. More research is required in this area to elucidate the mechanism behind this. Though it is clear from research conducted till date that *O. sanctum* enhances growth rate in broilers.

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