EFFICIENCY OF SOME NATURAL FEED ADDITIVES AS GROWTH PROMOTERS FOR BROILER CHICKENS

By

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ABSTRACT

Amany Hussien Waly: Efficiency of Some Natural Feed Additives as Growth Promoters for Broiler Chickens. Unpublished Ph.D. Thesis, Department of Poultry Production, Faculty of Agriculture, Ain Shams University, 2010.

This experiment was conducted to evaluate the effect of using leaves of artichoke and chicory plants as growth promoters. A total number of 390 unsexed 7 day old broiler chicks were used to evaluate the effect of using leaves of artichoke and chicory plants during the 7-21, 22-35 or 1-35d periods in comparison to control diet. The experimental diets were divided into 13 groups, the first group was control and the other 12 groups were treatments. Birds received basal diets containing 0/0, 0.5/0, 0.5/0.5, 0.5/1, 1/0, 1/0.5 and 1/1% (starter/finisher diet) artichoke, or 0/0, 0.5/0, 0.5/0.5, 0.5/1, 1/0, 1/0.5 and 1/1% (starter/finisher diet) chicory. All diets were formulated using linear programming to be isonitrogenous and isocaloric. Diets and water were provided *ad-lipitum* during the experimental period.

Artichoke leaves significantly improved live body weight and body weight gain. Feed consumption was significantly affected by using artichoke leaves as feed additives. Feed conversion ratio during the entire experiment period was significantly improved by using artichoke leaves. There were significant effects on digestibility coefficient of CP, EE and CF due to supplementation with artichoke. Total edible parts were significantly increased, while, abdominal fat percentage was significantly decreased. Blood plasma total lipids and cholesterol were significantly decreased. However, plasma triglycerides level was not affected. Moreover, using the globe artichoke as feed additives was shown to increase thyroid hormones, stimulate the immune responses and improved sensory evaluation.

Live body weight and body weight gain were significantly increased by using chicory as feed additives, while, feed consumption was not significantly affected, with a significant effect of treatment on digestibility coefficient of DM, CP and CF. Carcass percentage and total edible parts were significantly increased, while, abdominal fat was significantly decreased.

It is concluded that leaves of artichoke and/or chicory plants can be used as feed additives for improving growth performance, carcass characteristics and immune responses.

Key Words:

poultry nutrition, feed additives, the globe artichoke, chicory, growth performance, carcass characteristics, immune responses

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LIST OF ABBREVIATIONS

Abs	antibodies
ALT	alanine aminotransferase
AST	aspartate aminotransferase
BWG	body weight gain
CF	crude Fiber
CP	crude protein
DM	dry matter
EE	ether extract
FOS	fructooligosaccharides
g	gram
hr	hour
g	kilo gram
LBW	live body weight
mg	milligram
ME	metabolize energy
NFE	nitrogen free extract
ns	non-significant.
OM	organic matter
PI	performance index
REE	relative economic efficiency
Sig	significant.
Tr	treatment
T_3 hormone	triiodothyronine
T_4 hormone	thyroxine
wk	week

1. INTRODUCTION

Antibiotics are widely used as therapeutic, prophylactic and growth promoting agents in livestock and poultry production **(Peri, *et al*., 2009)**.

In poultry, antibiotics usage had facilitated their efficient production, and also enhanced the health and wellbeing of poultry by reducing the incidence of diseases **(Dan, 2003)** either by killing or inhibit the growth of bacteria **(Nita, 2007)**. Unfortunately, edible poultry tissues may be contaminated with harmful concentrations of drug residues **(Shahid, *et al*., 2007)**. Besides, their indiscriminate use caused an increased bacterial resistance **(Berchieri, *et al*., 1989)**. To overcome those problems there are several kinds of antibiotics-alternatives which developed and used currently. Among which readily memorable natural medicinal plants and herbs with their excellent physiological activity are getting attention by researchers **(Hernandez, *et al*., 2001)**.

For examble, artichokes and chicory are believed to have several effect on liver, kidney and some endocrine glands activity in both avian and mamalian.

Recent research referred to an alternative approach to sub-therapeutic antibiotics in poultry production by using agro-industry by-products in poultry diets. Supplementing broiler diets with non-traditional feed additives may be an alternative way to improve nutrients utilization, promote growth performance and reduce hazard pollution resulting fron these waste products.

Artichoke refuse parts (stalks and leaves) and chicory plants are suggested by many authers as a good alternative for antibiotics because of their medicinal effects, inulin content, polyphenolic and fructooligosaccharide contents **(Femenia, *et al*., 1998; Yusrizal and Chen 2003; Kleessen, *et al*., 2003 Brown, *et al*., 2005; Schutz, *et al*., 2004** and **Abdo, *et al*., 2007)**

A high content of oligosaccharides was observed in artichoke **(Frutos, *et al*., 2008)** and in chicory **(Timmermans, *et al*., 2001** and **Yusrizal and Chen, 2003)**

Baurhoo, *et al*. (2007) mentioned that oligosaccharides (prebiotic) can be used as alternatives to antibiotic growth promoters in broilers. Moreover, the globe artichoke was reported to contain flavonoid which have hepatoprotective and antioxidant activity **(Jellin, *et al*., 2002)**, a source of phenolic compounds which is natural antioxidants **(Schutz, *et al*., 2004)**, cynarin which reduce cholesterol biosynthesis **(Pittler, *et al*., 2005)**, and it is a good source of health-promoting polyphenols **(Fratianni, *et al*., 2007)**. Also, **Zhua, *et al*. (2005)** discovered an antifungal, hypocholesterolemic and anticarcinogenic activities of the globe artichoke.

On the other hand, chicory plant was reported to relieve liver, spleen, kidney disordera and to enhance appetite and supports the body's ability to absorb calcium **(Kapes and Frey, 2005)**. It contains also chicoric acid which have strong antioxidant activity **(Jayasinghe, *et al*., 2003).**

Chicory is known to possess hepatoprotective features **(Khan, *et al*., 2009)**, used for treatment icterus, renal failure, gout and arthritis in human without any side effects as reported by **Afrough, *et al*. (2009)**.

Therefore, the present study was undertaken to evaluate the effect of using artichoke leaves, and/or chicory plant in broiler diets on the growth performance and immune response, carcass quality, some blood parameters and economic efficiency of these treatments.