



## Effect of adding different levels of lemon grass leaves *Cymbopogon citratus* to the diet and its extract in drinking water on the quality characteristics of the carcass to broiler Chickens (Ross 308)

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### Abstract

This experiment was conducted at the poultry farm of the college of Agriculture, University of Al-Qasim Green for the period from 18/9/2019 to 23/10/2019. The study was aimed to the effect of adding different levels of lemongrass leaves (*Cymbopogon citratus*) to the diet or its extract to drinking water on the qualitative qualities of the carcass to broiler chickens (Ross 308). In the experiment, 225 unsexed broiler chicks (Ross), which obtained from Al-Anwar hatchery, it the were randomly distributed on 15 pen, with 5 experimental treatments, 45 birds for each treatment. Each treatment included three replicates per 15 birds. The treatments of the experiment were as follows: First treatment: control group free from any addition . The second treatment: a basic feed added to 10 g of lemon grass / kg feed, the third treatment: a basic feed added with 20 g of lemon grass / kg feed, The fourth treatment: adding 100 ml of the aqueous extract of the lemongrass / liter of drinking water, and the fifth treatment: adding 200 ml of the aqueous extract of the lemongrass liter of drinking water. The experiment included studying the following characteristics: the relative weights of the main and secondary carcass parts, and the relative weights of the eating giblets. As for the live body weight before slaughter and the weight of the carcass, the results showed that the fourth treatment and the fifth treatment were significantly higher than the rest of the experiment.

**Keywords:** Lemon grass, *Cymbopogon citratus*, Quality characteristics, Carcass of broiler.

Research paper from MSc thesis for the first author.

### Introduction

Medicinal plants contain many active compounds with different effects and they are either present in the plant or in the form of metabolic products and these materials are divided into either a toxic and deadly type or beneficial and nutritious (Al-Ani, 2002). Herbs have been used in the treatment of health problems that appear in poultry, these were used Medicinal and aromatic plants and their extracts for their in improving health (Al-Shahat, 2000). Some plant extracts have a stimulating effect on the digestive system of animals and poultry, as they improve the function of organs, especially the liver, and this leads to an increase in digestive enzymes that increase the benefit from eating food and meeting the need of the body (Jamroz and Kamel, 2002). the feeds and natural additives are among the components that affect improving growth as well as food conversion, so plants and

medicinal herbs have been used in recent years to feed animals (Hassan and Muhamad, 2007). Plant extracts have been used to treat many diseases, especially animal respiratory diseases (Al-Shahat, 1986). and from this plant it is the Lemon grass, whose scientific name is *cymbogon citratus* It is considered one of the medicinal plants wide use since ancient times and it is an aromatic herb perennial with long and smooth leaves. It lives in hot countries such as Egypt, Sudan, Saudi Arabia, India, Ceylon and East Africa (El-Degwy, 1996). Recent and ancient studies have shown that this plant has many medicinal benefits for its high content of volatile oil, which contains many compounds, especially the main compound Citral, which ranges between 65-90% and the compound myosin 10-25% and neighbors 1-4%, as this plant is used as a disinfectant and analgesic for headaches. And the treatment of rheumatism, as it is antihypertensive and is useful in

treating ulcers and colitis as well as cold and flu diseases (Al-Rawi and Jakerh, 1988). Inhibitor of the growth of microorganisms and fungi (Al-Sadiq, 2006). It has also been used industrially for food preservation and flavor addition (Tarab and Shawwa, 2000). With the increase in the global population of nearly seven billion people, and expectations that this number will reach eight billion in 2020 and with an annual increase of 93-95 million (Gore, 1993). What accompanied and will accompany this increase from the diseases of the modern era and the danger resulting from the side effects of the chemical drugs used, all these reasons were sufficient to go or advise people to go to nature in search of plants with a medical effect in treating diseases and that most of the diseases that we suffer from find the solution in nature more than in pharmacy, and that pharmacology is used in the broadest field of nature herbs for the composition of drugs and medicines (Al-Mayah, 2001). Based on the above of the foregoing, and given the great importance of the leaves of the lemon grass plant, the aim of the present study was to know the nutritional value of the powder of the lemon grass plant their use and determination of the best proportions added to the diet or to drinking water that can be used in poultry diets and its the quality characteristics of , which we can recommend.

### Materials and Methods

This experiment was conducted at the poultry farm of the college of Agriculture, University of Al-Qasim

Green for the period from 18/9/2019 to 23/10/2019. The study was aimed to the effect of adding different levels of lemongrass leaves (*Cymbopogon citratus*) to the diet or its extract to drinking water to on on the quality characteristics of the carcass of broilers broiler Chickens (Ross 308). In the experiment, 225 unsexed broiler chicks (Ross), which obtained from Al-Anwar hatchery, it the were randomly distributed on 15 pen, with 5 experimental treatments, 45 birds for each treatment. Each treatment included three replicates per 15 birds. The treatments of the experiment were as follows: First treatment: control group free from any addition . The second treatment: a basic feed added to 10 g of lemon grass / kg feed, the third treatment: a basic feed added with 20 g of lemon grass / kg feed, The fourth treatment: adding 100 ml of the aqueous extract of the lemongrass / liter of drinking water, and the fifth treatment: adding 200 ml of the aqueous extract of the lemongrass / liter of drinking water. The experiment included the study of the following traits: the relative weights of the main and secondary carcass parts, and the relative weights of the edible internal organs. The Completely Randomized Design was used to study the effect of different treatments on the studied traits, the significant differences between the averages were compared using Duncan's Multiple Range Test (Duncan, 1955) and the SAS (SAS, 2012) was used to analyze the data.

**Table 1: Percentage of Feed materials Included in the composition of the initial diet and final diet used in the experiment with the calculated chemical composition for both diets.**

Feed material	Initiator diet (1-21) %	Final diet (22-35 day) %
yellow corn	48.2	58.7
Local wheat	8	7.5
Soybean meal (44% protein)	28.5	20.5
Concentrated Protein*	10	10
Vegetable oil (sunflower)	4	2.5
limestone	1	0.5
Food salt	0.3	0.3
Total	%100	%100
<b>The Calculated Chemical Analysis **</b>		
Metabolized Energy (kcal/kg)	3079.85	3102.6
Crude protein (%)	21.56	18.87
Lysine (%)	1.04	0.85
Methionine + Cysteine (%)	0.455	0.42
Raw fiber (%)	3.54	3.2
Calcium (%)	1.28	1.07
Phosphorus availability (%)	0.42	0.41

\*Concentrated protein (Belgian origin), each kilogram contains: 2200 kcal/kg metabolized energy, 40% crude protein, 8% fat, 3.5% fiber, 25% ash, 8% calcium, 3.1 phosphorus availability, 1.2% lysine, 1.2% Methionine, 1.8%

Methionine + 70 mg, 30 mg Vitamin B1, 300 mg Vitamin E, 2500 IU D3, Cysteine A, 2% Chlorine, 10,000 IU 12 mg Folic Acid, 250 mg B12, B 120 mg Pantothenic acid, 400. mg niacin, 50 mg vitamin B2, 5000 mg Choline chloride, 450 mg iron, 70 mg copper, 600 mg, C 600 mcg biotin, 1000 mg special vitamin, 750 manganese, 5 mg iodine, 1 g cobalt and antioxidants. \*\* chemical composition was calculated according to analysis of feed materials mentioned in (NRC, 1994).

### Results and Discussion

Table 2 shows the results of the statistical analysis of the effect of adding different levels of lemon grass leaf powder to the diet and its extract to drinking water in live body weight, cleaned carcass weight (empty), (Without the organs Interior) and the percentage of weights of the pieces that include the Main (Breast, thigh) And the secondary (back, neck, wings), with regard to live body weight, we notice a significant superiority ( $P \leq 0.05$ ) for the fourth and fifth treatment birds over the first (control), second and third treatment birds, where the fourth and fifth treatments recorded the highest live body weight, while the first treatment was recorded (Control) the

lowest live body weight, as for the second and third treatments, which in turn were significantly superior to ( $P \leq 0.05$ ) over the first treatment, as for the weight of the carcass without the edible viscera, we note that the fourth and fifth treatments were significantly superior ( $P \leq 0.05$ ) over the first and second treatments, while the The first treatment is the lowest empty carcass weight, while the second and third treatments, which in turn, significantly exceeded ( $P \leq 0.05$ ) over the first treatment, As for ratio and the average of the relative weights of the carcass pieces, there were no significant differences between the parameters of all experiment.

**Table 2: Effect of adding different levels of Lemon grass leaves *Cymbopogon citratus* to the diet its extract in drinking water on the quality characteristics of the carcass of broiler Chickens for at 35 days**

Treatments	Live Weight - gm	Carcass weight - gm	dressing percentage %	Breast %	Thigh%	Neck%	Wing%	back%
First treatment	2246.67 ±29.48 c	1645.00±21.79 d	73.21±0.75	27.74±1.21	37.71±0.44	10.01±0.24	5.44±0.20	17.4±31.56
Second treatment	2371.67±24.55 b	1764.00±18.14 c	74.37±1.18	26.94±1.15	37.79±0.76	10.10±0.10	4.78±0.27	18.92±0.50
Third treatment	2383.33±10.13 b	1786.67±7.26 bc	74.96±0.06	28.04±0.20	40.42±0.29	9.37±0.47	4.85±0.07	16.15±0.38
Fourth treatment	2449.00±16.25 a	1846.00±16.86 ab	75.37±0.27	28.33±1.03	37.70±2.31	9.71±0.54	6.67±1.25	16.56±1.85
Fifth treatment	2486.33±17.53 a	1871.67±29.20 a	75.27±0.68	29.03±0.46	38.51±1.45	8.85±0.87	4.70±0.21	17.74±0.67
Significant level	*	*	NS	NS	NS	NS	NS	NS

Averages with different letters within a single column are significantly different. \* ( $P \leq 0.05$ ); NS: not significant.

First treatment: control group free from any addition. The second treatment: a basic feed added to 10 g of lemon grass / kg feed, the third treatment: a basic feed added with 20 g of lemon grass / kg feed, The fourth treatment: adding 100 ml of the aqueous extract of the lemongrass / liter of drinking water, and the fifth treatment: adding 200 ml of the aqueous extract of the lemongrass liter of drinking water.

Table 3, The effect of adding different levels of lemongrass to the diet and its extract to drinking water on the average relative weights of the edible internal organs (heart, liver and gizzard), as it

showed that there were no significant differences between all Treatments birds in the relative weight of each of (heart, Liver and gizzard).

**Table 3: Effect of adding different levels of Lemon grass leaves *Cymbopogon citratus* to the diet and its extract in drinking water on the average relative weights of the eating giblets of broiler at 35 days**

Treatments	Heart%	liver%	gizzard%
First treatment	0.41±0.03	2.54±0.03	1.23±0.01
Second treatment	0.41±0.02	2.38±0.19	1.19±0.06
Third treatment	0.46±0.02	2.26±0.21	1.18±0.11
Fourth treatment	0.39±0.01	2.55±0.35	1.14±0.06
Fifth treatment	0.43±0.00	2.51±0.03	1.20±0.08
Significant level	NS	NS	NS

NS: not significant. First treatment: control group free from any addition . The second treatment: a basic feed added to 10 g of lemon grass / kg feed, the third treatment: a basic feed added with 20 g of lemon grass / kg feed, The fourth treatment: adding 100 ml of the aqueous extract of the lemongrass / liter of drinking water, and the fifth treatment: adding 200 ml of the aqueous extract of the lemongrass liter of drinking water.

It is also evident from Table (2) regarding the significant superiority in live body weight before slaughter and carcass weight for treatments of lemon grass leaves and the its aqueous extract, mainly due to the higher live weight of them, which was then reflected in body weight before slaughter and the carcass weight .

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