IMPACT OF DIFFERENT LEVEL PEPPERMINT AND GINGER SUPPLEMENTATION ON BROILER PERFORMANCE AND BLOOD PARAMETER

Heidar Hassan KHDR

MASTER THESIS

ANIMAL SCIENCE Department

Supervisor: Assoc. Prof. Dr. Bünyamin SÖĞÜT
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BİNGÖL UNIVERSITY
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This thesis was unanimously approved by the following jury on 13.06.2017

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Prof. Dr. İbrahim Y. ERDOĞAN
Director of the institute

PREFACE

First of all, I praise God, the almighty for providing me this opportunity and granting me the ability to proceed successfully. This thesis appears in its current form due to the assistance and guidance of several people.

I am forever thankful to my parents, Hassan (father) and Miryam (mother), and my sisters and brothers, for their love and steadfast support, and for believing in me and melding me into the individual I have become.

I would like to take this chance for expressing my deep and honest gratitude and thankfulness to my dearest tireless supervisor, associate prof. Dr. Bünyamin SÖĞÜT, for his priceless advices, comments, suggestions and guidance, proposed with an extreme kindness, without him my present work would be never completed. Most importantly which I need during work, Finally, I would like to thank all those who donated to this work with help, work or a piece of advice or information. Thanks are also due to all my friends; without whose support it would not have been probable to carry out this research.

This work is dedicated to my loving parents (Mother and Father), and dedicated to my sisters and brothers and to my nephew (Redin) and niece (Sava).

Heidar Hassan KHDR
Bingöl 2017

CONTENT

YÖK watermark

LIST OF ABBREVIATIONS

%	:	Percentage
ºC	:	Degree Celsius
Ml		Microliter
Cm	:	Centimeter
g	:	Gram
L	:	Liter
Min	:	Minute
M	:	Meter
ML	:	Milliliter
CP	:	Crud protein
BW	:	Body weight
FCR	:	Feed conversion ratio
FI	:	Feed intake
PCV	:	Packed cell volume
HB	:	Hemoglobin
HDL	:	High density lipoprotein
LDL	:	Low density lipoprotein
Rpm	:	Revolutions per minute
CRD	:	Complete randomized design

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BROYLER RASYONUNA FARKLI DÜZEY BİBERYA VE ZENCEFİL İLAVESİNİN BÜYÜME PERFORMANSI VE KAN PARAMETRESİ ÜZERİNE ETKİSİ

ÖZET

Bu çalışmanın amacı broiler rasyonlarına %0,5 ve % 1 seviyelerinde prebiyotik kaynağı olarak nane yaprağı ve zencefil kökü eklenmesinin büyüme performansı, karkas özellikleri ve kan parametreleri üzerine etkisini belirlemektir. Toplam 225 adet günlük civcivler, 5 gruba 3 tekerrürlü olacak şekilde şansa bağlı olarak dağıtılmışlardır. Gruplar, katkı maddesi içermeyen control (T1), % 0,5 Nane ihtiva eden T2, % 1 Nane içeren T3, % 0,5 Zencefil içeren T4 ve % 1 Zencefil içeren T5 şeklindeydi. Her civcive, 6 haftalık deneme süresince yem ve suya serbestçe erişebilecek imkanlar sağlandı. Yeme eklenen her iki tip prebiyotik takviyesinin birinci, ikinci ve üçüncü haftalar haricinde canlı vücut ağırlığı üzerinde herhangi bir etkisi olmadığı ve üçüncü ve beşinci haftalar haricinde yem tüketimi, yem dönüşüm oranının etkisini göstermediği ancak deneme sonunda karkas kalitesi etkili olduğu görülmüştür. Muamele erkeklerde karkas yüzdesi ve karaciğer dışında bir etki göstermemiştir. Ayrıca, her iki prebiyotik de kan kolestrol ve toplam protein üzerine etkili olmuştur. En iyi karkas oranı T4 ve T5 gruplarında elde edlilmiştir. Genel olarak, farklı düzeylerdeki her iki prebiyotik üretim performansını olumlu yönde etkileyemediği, buna karşılık kolestrolü ve total proteini iyileştirebileceği sonucuna varılmıştır.

Anahtar Kelimeler: Broiler, nane, zencefil, büyüme performansı, kan parametresi.

IMPACT OF DIFFERENT LEVEL PEPPERMINT AND GINGER SUPPLEMENTATION ON BROILER PERFORMANCE AND BLOOD PARAMETER

ABSTRACT

The aim of this study was to figure out the effect of different level of peppermint and ginger supplementation on broiler performance and blood parameter. In this study Peppermint and Ginger root powder as a source of prebiotic at level of 0.5% and 1% were supplemented to determine the growth performance, carcass characteristics and blood characterize in broiler chicks. An experiment of 42 days was conducted with a flock of 225 one-day old chicks. The birds were divided into 5 treatment groups with 3 replication by completely randomized design. The groups were control with no additive (T1), the second group (T2) contained 0.5% Peppermint, the third group (T3) contained 1% Peppermint, the fourth group (T4 contained 0.5% Ginger and the fifth group (T5) contained 1% of Ginger. All chicks had free access to feed and water *adlibitum* during the 6-wk of experiment. The results showed the both type of dietary prebiotic supplementations had no effect on the live body weight except the first, second and third weeks, and feed intake, feed conversion ratio with no effect except the third and fifth weeks, and carcass characterize at the end of the experiment with no effect except the dressing percentage and liver in male. Also, the blood characterize content (cholesterol and total protein) were affected by both type of prebiotics. While, the best result of dressing percentage recorded in T4 and T5. Overall, it was concluded that different level of the both type of prebiotics cannot positively effect on production performance, while it can improve the cholesterol and total protein.

Keywords: Broiler, peppermint, ginger, fattening persormance, blood parameters.

1. INTRODUCTION

The meat of poultry production has increased generally in the world in the last decade. Chicken and all productive poultry has become popular because the white meat is a healthier than the red meat (Balamatsia et al. 2006). The nutrition value of chicken meat is very high and cholesterol is a low, and prices are a cheaper compared to red meat. Present of less saturated fatty acids level in white meat is the main reasonsto choose for arteriosclerosis, and for heart diseases due to the deposition on the blood vessels (Fao 1992). The muscle of chicken contained not less than 20% protein, and a high level of essential amino acids and vitamins has been used for human growth, in addition to being easy to prepare and to digest and suitable for all age groups (Lawrie 1998).

The effect of dry peppermint (*Mentha piperita*) supplementation to feed, among the alternative growth promoters, on feed intake, growth, carcass and gastrointestinal tract characteristics of broilers has not been reported clearly yet.

The study (Ocak and Erener 2008) was showed to define the effects of dietary dry peppermint, as growth promoter supplementation of growth performance, carcass and gastrointestinal tract characteristics on broilers. Mortality was lower in birds fed by peppermint diets compared in birds fed by control diets for the entire growing periods. Antibiotics were widely used in poultry production and modern livestock to treat sick animals, but they are also administered in healing doses, usually in water or feed, to defend animals against diseases and to promote growth. Sub therapeutic dose of antibiotics (STAs) can promote growth, particularly in poultry and hogs, by improving nutrient absorption and by depressing the growth of organisms that compete for nutrients, thereby increasing feed efficiency. Early indications of a useful effect of antibiotics on production efficiency in poultry and swine were reported by Moore et al. (1946) and Jukes et al. (1950). Peppermint (*Mentha piperita*) is perfumed, rarely annual, almost exclusively constant, herbs that are widely spread and can be found in many Environments (Brickell and Cole 2002). Mint containin oil and menthol are widely used as flavorings and antiseptic. Mint activity depend on the abundant volatile oil, which contains a hydrocarbon, thymol and higher oxygenated compounds (Grieve 1981; Chopra et al. 1992). Analgesic (topical), anti-inflammatory, calms an upset stomach and digestive aid, dissolves gallstones, improves solubility of bile, eliminates heartburn, inhibits and kills microorganisms (Influenza A viruses, Pseudomonas acruginosa, Streptococcus pyogenes, Staphylococcus aureus) , normalizes gastrointestinal activity , inhibits obstipation, inhibits diarrhea, prevents congestion of blood to the brain, reduces bile cholesterol levels, stimulates circulation, stimulates contractile activity and bile secretion in the gallbladder (Blumenthal 1998). Medicinal plants have been usually used for the treatment of various diseases in human and animals. A number of dietary herbs, plant extracts and important oils have been studied for their antimicrobial and growth promoting abilities in poultry (Cross et al. 2007). When combined into broiler diets, some herbal supplements improved growth performance, decrased feed conversion efficiency; carcass and meat quality in broilers, also reduced feed cost (Huang et al. 1992).

All mints favor and succeed in cool moist spots in part shade. They are fast growing, spreading their spread along surfaces through a network of runners. Mint essential oil and menthol are widely used as flavorings in breath fresheners, chewing gum, tooth paste, drinks, sterile mouth rinses, sweets and candies. The main medicinal action of the leaves and flowers of the mint depends on the plentiful volatile oil, contains a hydrocarbon and higher oxygenated compounds. It produces its advantages to boiling water, but particularly to alcohol. Vapors are antispasmodic, choleric and carminative (Galib et al. 2010). Mint is usually taken after a meal for its capability to lessen indigestion and colonic spasms by reducing the gastrocholic reflux (Spirling and Daniels 2001).

The results were noted by Demir et al. (2008) concerning the effect of spearmint on broiler body weight. The results of Amasaib et al. (2013) showed that the dietary treatment had no significant effect ($P>0.05$) on feed intake. The insignificant effect of addition of spearmint to the basal diet may be due to the fact that, the diets were caloric and it is probable that the feed ingesting could be similar or may be due to the similar environmental during the period. Durrani et al. (2007) reported that the body weight gains was similar to that results of control. In addition, antifungal, antimicrobial, antioxidant and anti-inflammatory effect of peppermint was also reported by several researchers (Ali 1999; Umaevi 2001; Padurar et al. 2008). Likewise, the supplementation of poultry diets with perfumed plants have a stimulating effects on digestive system of the animals through the increasing the production of digestive enzymes and by improving the use of digestive products through improved liver function (Hernandez et al. 2004). However, significant improvements in growth performance compared to the control was shown by a peppermint feeding on broilers diet. The supplementation of peppermint to the diets could be an alternative to the use of antibiotics as a growth promoter in poultry production (Gurbuz1 and Ismael 2016).

The aims of this study was to investigate the effect of two different types of prebiotics supplementations, Peppermint (Mentha piperita) and Ginger (Zingiber Officinale), on production performance and the blood parameters of broiler chicks. The specific objectives of this study were addressed by the following:

- To investigate the effects of prebiotic on growth performance on broiler chickens.
- To investigate the effects of prebiotic on blood parameters content.
- To investigate the effects of prebiotic on carcass percentage.

2. LITERATURE REVIEW

2.1. Medicinal Plants

Plant origin additives to feed are believed as safer, healthier and less regarded than synthetic additives (antibiotics). It was estimated that there are 250,000- 500,000 species of plants on the earth (Borris 1996; Hashemi and Davoodi 2010). Recent bans and limits on the use of animal as antibiotic growth promoters are stimulated interest in bioactive and secondary metabolites of plant source as alternative performance enhancers (Greathead 2003). Many scientists have searched for alternatives to antibiotics through use of the extracts or leaves of some of these plants (Long at al. 2000; Kamel 2001; Alcicek et al. 2003). The supplementation of spices and herbs could have many benefits to broilers health and performance such as having antioxidative potential (Hui 1996), antimicrobial activity (Dorman and Deans 2000), enhancing digestion by stimulating endogenous enzymes (Brugalli 2003).

Naidoo et al. (2008) reported that antioxidant rich plant extracts have latent benefits in treating coccidian infections. Herbs and herbal products are incorporated in poultry diets to replace synthetic products in order to stimulate or promote the effective use of feed nutrients which may next result in more quick body weight gain, higher production rates and improved feed efficiency. Moreover, active components of herbs may improve digestion and stimulate the immune function in broilers (Ghazalah and Ali 2008). Steiner (2009) stated that medicinal plants and essential oils extracted from these plants are becoming more important due to their antimicrobial effects and the stimulating effects on the animal digestive systems. The microflora of the small intestine is made up mostly of lactic-acid for producing bacteria (Engberg et al. 2000).

Lactic acid is the fermentation by product of lactic-acid, produced by bacteria, and the increase in lactic acid concentrations in the poultry gastrointestinal tract that causes the pH to drop, and so preventing the colonization of sure pathogens (Zhang et al. 2003). Also, Rahimi et al. (2011) detected that plant extracts can increase the number of lactic acid bacteria in the ilea and ceaca contents of broilers. It has been shown that the dietary unification of herbs and their related vital oils may provide helpful effects on poultry performance and health due to the antimicrobial activity of their phytochemical components (Lee et al. 2004b). But, other studies haven't found positive effects of herbs and their related vital oils. These last findings may be related to experimental conditions such as cleanliness and dietary agents (Lee et al. 2003a).

2.2. The Action of Ginger

Figure 2.1. fresh and powder Ginger root

Ginger Zingiber Officinale (Roscoe) is the herbs an underground root plant that belongs to the family Zingibeaceae and now it is measured a common basic of diet worldwide (Sertie' et al. 1991) and widely used as a spice. The type Zingiber was named after the Sanskrit word zindschi (hornshaped) by the English botanist William Roscoe (1753-1831), in a report published in 1807 (Roscoe 1807). Ginger, probably, originates from South-East Asia. The olden Greeks and Romans brought the rhizome to Southern Europe. Already in the 11^{th} century, it is mentioned in Anglo-Saxon veterinary pharmacopoeias and leech books. In the 13^{th} century, it was well known in all of Europe, and the Spanish established first plantations in the West Indies (mainly Jamaica) and in Mexico in the 16^{th} century. Today ginger is cultivated in the tropical parts of the world, from Asia to Africa, and large parts of South and Central America; mainly in India, Indonesia, Nepal, and

Nigeria, southern China. The best quality is said to come from Jamaica (Köhler 1887; Wichtl 2002). Ginger is a medicinal plant which is widely used in the world. The main important compounds in Ginger (Zingiber officinale) are gingerdiol, gingerol and gingerdione which have the capacity to stimulate digestive enzymes, affect the microbial activity (Dieumou et al. 2009) when used in broiler diets. Gingerol in the ginger is produced spicy taste (Jolad et al. 2004; Shariq et al. 2011) contains an enzyme called "zingibain" that helps digestion (Adulyatham and Owusu-Apenten 2005). Also it acts, as an antimicrobial (Akoachere et al. 2002; Jagetia et al. 2003; Mahady et al. 2003), antioxidant (Nakatani 2000; Rababah et al. 2004), and has various pharmacological effects (Chrubasik et al. 2005; Ali et al. 2008).

Immuno-modulatory, anti-apoptotic, anti-hyperglycemic, antitumori-genic, anti-inflammatory, anti-lipidemic and antiemetic properties are among the other therapeutic effects of ginger detected (Badreldin et al. 2008). Powdered basis of ginger has long been used as traditional medicine to reduce the gastrointestinal diseases (Afzal et al. 2001).

Ginger extracts have shown to exhibit antibacterial activity in invitro studies (Malu et al. 2008; Indu and Nirmala 2010). Ginger is the herbs and used to improve pancreatic lipase activity (Platel and Srinivasan 2000). It affects on intestinal lipase, disaccharidase, sucarase and maltase activities of rats (Platel and Srinivasan 1996). All of these have positive effects on gut function, which is the main method of action for growth stimulating feed additives (Windisch et al. 2008).

2.3. The Action of Peppermint

Peppermint (Mentha piperita) is a perfumed perennial plant that grows to a height of about 3 fit (1 m). It has light purple flowers and green leaves with serrated limits. Peppermint belongs to the Lamiaceae family and grows during North America, Asia, and Europe. There are more than 25 species of true mint grown throughout the world.

Figure 2.2. fresh and powder Peppermint

The plant is reaped when the oil content is highest. When ready for reap, it is always collected in the morning before noon, because sun reduces the leaf essential oil content. This generally takes place shortly before the plant flowers, which occurs in the summer (July through August) or during dry, sunny weather. The United States is responsible for producing 75% of the world's source of peppermint.

Analgesic (topical), anti-inflammatory, calms an upset stomach, digestive aid, dissolves gallstones , calms and strengthens nerves, eliminates heartburn, improves solubility of bile, inhibits and kills micro-organisms (Influenza A viruses, seudomonas acruginosa, Streptococcus pyogenes, Staphylococcus aureus) , prevents congestion of blood to the brain, reduces bile cholesterol levels , inhibits constipation, inhibits diarrhea, normalizes gastrointestinal activity, stimulates circulation, stimulates contractile activity and bile secretion in the gallbladder (Blumenthal 1998).

Colby et al. (1993) reported that the Menthol is a type of about 25 species (and hundreds of varieties) of flowering plants in the family lamiaceae (Mint amily). Mentha (spicata) is an important raw material that has been used as a diuretic, carminative, antispasmodic, confectionary, and as flavoring agent for toothpastes, chewing gums cosmetic and many other products.

Savithri Bhat et al. (2002) reported that the families of Labiate, which are rich in essential oil, have commercial and medical values. They are wide through the world. The growing of aromatic and medicine plants in our country becomes more and more popular and needs selecting the most suitable plants (Viskelis et al. 2003).

2.4. Effects of Prebiotic on Poultry

2.4.1. Performance Parameters

The significant differences ($P< 0.05$) in feed intake, body weight gains and feed conversion ratio and the best results were showed in T4 (6g per kg of feed) which had the highest overall performance compared T1 (control) had the lowest performance (George et al. 2013).

Data on weekly body weight, gain in weight, and feed efficiency of broilers up to five weeks of age; the data were composed and analyzed statistically to determine impact of treatments on performance of broiler. It was shown that diets supplemented with ginger root powder had significant ($P<0.05$) effect on the body weights, gain in weight of broilers. There were non-significant differences ($P>0.05$) in feed conversion ratio among all dietary treatments for birds. Result showed that non-significant decreased ($P>0.05$) were detected in feed intake. Best body weight, gain in weight of broilers was detected in diet supplemented with 0.75 g, followed by 1.75 g, 1.25 g ginger powder and diet as per NRC standard (control). Treatments 0.75, 1.75 were economically better than control. Supplementation 0.75 g in ration was most economical followed by inclusion of 1.75 g ginger powder in ration. Compared to control and other treatments proved better (Ahmed Yasir Rebh 2014).

The total body weight gains of birds treated with feed additive were significantly ($P<0.05$) higher in relative to control one. The group 15g in Ginger presented the best feed conversion ratio (FCR) followed by Ginger 5 g, ginger and thymol significantly decreased the levels of serum total cholesterol and triacylglycerol. Likewise, supplementation of broilers by ginger and thymol significantly decreased the breast and thigh malondialdehyde (MDA) and significantly increased muscle glutathione (GSH), serum interferon gamma (INF-) and interleukin 2 (IL-2) levels (Doha et al. 2016).

Herawati and Marjuk (2011) reported that adding 1.5% of ginger powder into the broiler diet significantly (P< 0.05) improved the total weight gain compared to the control, being 1955.5g and 1899.7g individually during 5 weeks. Similar results were found when broilers fed diets containing 1.5% of red ginger when compared to the control, 0.5%, 1% and 2% groups, being 1955.53, 1899.71, 1888.44, 1858.25 and 1859.5 g/bird, respectively, during 5 weeks of treatment.

Ebrahimnezhad et al. (2014) was reported that the Ginger treatment significantly improved the growth performance in broilers compared to the not supplemented controls. In addition, carcass characteristics and blood biochemistry parameters were not significantly changed except comparative weight of exenterated carcass and blood LDL. These data advise that the ginger may improve growth performance in broiler chickens.

Herawati and Marjuk (2011) stated that feed conversion ratio was significantly improved (P< 0.05) when different levels of dietary ginger powder used in broilers diets with 0.5, 1, 1.5 and 2% compared to the control group, being 2.15, 2.20, 2.15, 2.14 and 2.27, respectively, during 35 days. Many researchers tried to minimize the percentage of mortality using different feed additives including medicinal plants. Al-Hamadani et al. (2010) used two levels (0.4 and 0.8%) of ginger powder and they reported that mortality rate was zero in the group fed 0.8% ginger powder compared to the 0.4% ginger, (Herawati and Marjuki 2011) noted when compared between control and four levels of red ginger powder that diets supplementation with 1, 1.5 and 2% red ginger powder had significant (P< 0.05) higher carcass percentage (dressing%) (62.9, 62.9 and 64.9 %) respectively than those received 0.5% and control diet being (59.6 and 57.8%), abdominal fat percentage decreased significantly (P< 0.05) in broilers fed diets supplemented with red ginger powder 0.5, 1, 1.5 and 2% compared to those broilers fed the basal diet, (1.87, 1.85, 1.81, 1.75 and 2.56) respectively. Ademola et al. (2009) showed that there were no significant differences in the relative weights of (neck, thighs, breast and back) when used 1 and 1.5% ginger powder in broilers diets but relative weight of wings was positively affected (P< 0.001) compared to the control group, which were (9.21, 9.00 and 8.55%) respectively, while using 2% of ginger caused a significant (P< 0.001) decrease in relative weight of (breast and back) being (12.86 and 12.23%) respectively compared to the control group, (14.59 and 13.06%) respectively, but did not affect the relative weights of (neck, thighs and wings), relative weight of abdominal fat pad decreased significantly (P< 0.001) when using different levels of ginger 1, 1.5 and 2% compared to the control, being (0.85, 0.56, 0.45 and 1.88%) respectively. results showed that feed intake in full period (42 d) was not affected by treatments (P>0.05), while in the period of 1 to 21 d, there was significant increase (P<0.05) in T2 in terms of daily feed intake. Average daily gain in 1-21d, 22-42d and in the entire period was not affected by treatment (P>0.05), while numerically the largest weight gain was found in T5. The lowest feed conversion ratio (FCR) was detected in T3 in total periods while FCR was not affected significantly in all three experimental periods (P>0.05). The results showed that carcass weight, thigh weight, wing weight, chest weight, neck weight and liver weight at the end of the period was significantly high in T5 (P<0.05). However, the gizzard weight, back weight, intestinal length and abdominal fat were not affected by treatments (P>0.05). The results showed that the use of T5 in poultry rations have a good effect on performance and carcass characteristics (Adibnezhad 1M. Chaharaeen 2B, Mohammadian-Tabrizi 1H.R. 2014).

(Gurbuz and Ismael 2015) reported that mean LBW, BWG, FI, FCR and liver weight against T4 (1.5% pepper-mint) was significantly (P<0.05) higher for broilers in the other group. But had there were non-significant effect on the carcass, carcass yield and abdominal fat. Findings of the present study suggested that feeding peppermint and basil tend improve the growth performance and FCR of the broilers.

Mohamed et al. (2012) reported that in the broiler industry Body weight is a very important trait. Many studies were conducted to investigate the effects of medicinal herbs on the body weight of broilers. So , in this research reported that body weight was significantly (P<0.05) improved by the supplementation of dietary ginger powder at levels 0.1and 0.2% compared to the control group, being 2020.83, 2075.90 and 1875 g/bird respectively during 42 days of age.

Ademola et al. (2009) showed that using 1 and 1.5% of ginger in broiler diets had no significant effect on the body weight, while adding 2% of ginger had significant (P<0.01) negative effect on the body weight.

2.4.2. Blood Parameters Content

Cholesterol is a critical fatty substance required for the proper function of every cell in the body. Cholesterol is a structural component of cell membrane and plasma lipoproteins and is important in the synthesis of steroid hormones and bile acids. Mostly manufactured in the liver, some of it is absorbed through the diet, especially one high in saturated fats (Jaeger and Hedegaard 2004).

In actually, peppermint powder contains high amounts of iron 5.08 mg / 100gm (USDA, 2012), which arrives in the composition of blood hemoglobin and then in the manufacture of blood red cells (RBC) and subsequently an increase in the size of blood cells volume (PCV), peppermint also contains Bcomplex vitamins, participated in manufacturing erythrocytes processes in bone marrow (Sturike 1986). The reason for the high volume of blood cells associated with peppermint powder on vitamin A and E, which has an important role in inhibiting the decomposition red blood cells (Erythrolysis) through their work and protection plasma membranes from the damage of anti-oxidant that happens of oxidation stress (Coles 1986). The high level of fibers in peppermint 21.2/100gm can increase the elimination of bile and this can decrease the cholesterol level of blood (Al-kassie 2009). The reason for the high concentration of protein in the treatments fed peppermint powder to the role of vitamin A and carotenes as provide protection against catabolism reactions in the body through its physiological due as antioxidant (Burton 1989), also 6 vitamins A equality free radicals and inhibiting crash of DNA and proteins in the body (Surai et al. 2000). The low concentration of cholesterol in the blood plasma cause to have due to the high fiber in peppermint and not contain cholesterol (0%) (USDA 2012) which leads to reduce the absorption of diet cholesterol in the gastrointestinal tract (GI) (Nakaue et al. 1980), Peppermint leaves possitively provisions digestion by helping to breakdown fats and reduces bad cholesterol levels (LDL) and reduce the work load required from the liver (Gray 1984).

2.4.3. Antibiotics

In the poultry industry Chemical feed additives have been widely used since long time to increase animals' performance with respect to growth and feed efficiency (Collington et al.1990). Consequently, about 80% of domestic animals have been fed synthetic compounds for the purpose of either medication or growth raise (Lee et al. 2001). Antibiotics are microbial metabolites produced by fungi and algae which have low molecular weight and can prevent the growth of other microorganism's level in low concentrations (Nir and Ve-Senkoylu 2000). In 1950 antibiotics were accepted for use as animal feed additives (Gersema and Helling 1986). A total of 32 veterinary non-prescription antibiotic compounds are approved for use in broiler feeds in the U.S. Eleven compounds are recorded as growth promoters (AGP), fifteen are listed to treat coccidiosis and six are listed for other purposes (Jones and Ricke 2003).

Many guesses have been calculated by the Institute of Medicine (Khachatourians 1998; Committee on Drug Use in Animals 1999; Mellon 2001). The Animal Health Institute a trade organization (Carnevale 2000), and the Union of Concerned Scientists (Mellon 2001). Human use of antibiotics has been probable at (1.36–14.64) million kg/yr. while estimated antibiotic use in animal production is (7.36–11.18) million kg/yr. In Australia the amount of antibiotics used in animals (500,000 kg) is much greater than in humans (300,000 kg) per year (Jetacar 1999).

The chemical feed additives (antibiotics) have negative effects on the consumers owing to their remains which mostly remain in the broiler products. Increasing bacterial–resistant strains and special concerns about transferring resistant from animals to humans via food chain have caused the reduced or baned usage of antibiotics in poultry industry (Khachatourians 1998; Kamel 2001). Bacteria are very pliable organisms because of their very short generation time (as little as 15 to 20 minutes for some species under ideal conditions) and their tendency for distribution genetic information even amongst different species of bacteria. The presence of an antibiotic may kill most of the bacteria in an environment but the resistant survivors can eventually re-establish themselves and pass their resistance genes on to their progeny and, often, to other species of bacteria. Both medical and veterinary uses of antibiotics have resulted in the form of resistant strains of bacteria. Resistant bacteria which are human pathogens may cause diseases that are difficult to treat even if the resistant bacteria are not human pathogens, they may unmoving be dangerous because they can transfer their antibiotic resistance genes to other bacteria that are pathogenic (Taylor 1997; Barton 1998; Witte 1998; Wegener et al. 1999). One of the first reports of resistance in food animals was made by Starr and Reynolds (1951) after experimental feeding of streptomycin in turkeys. Other researchers (Barnes 1958; Elliott and Barnes 1959) have reported an association of resistance to tetracycline when growth- romoting levels of antibiotic are fed to chickens.

The scientific ground submitted by Sweden, as well as the conclusions of the World Health Organization (1997) and of the Economic and Social Team of the European Union (1998), led no longer to allow the use of antibiotics as growth promoters; Regulation 1831/2003 stated that antibiotics, other than coccidiostats and histomonostats, be marketed and used as feed additives only until December 31, 2005; as from January 1, 2006, those substances would be deleted from the Community Register of authorized feed additives(Castanon 2007). Also Disease Control & Prevention (CDC), Atlanta, USA is in favor of banning these feed antibiotics in the USA (Hileman 2002). Finally, the ban of antibiotics in animal feeds will have consequences in the international trade of poultry meat because the European Union only imports foods obtained from animals that were not fed with antibiotics, in application of the precaution principle allowed by the World Trade Organization. However, because concern is rising that drug-resistant pathogens could be transmitted to humans via the food-chain (World Health Organization 2003, 2004), it is expected that the use of antimicrobials in animal production will decrease in further years, at least in those farms with better hygiene conditions

3. MATERIALS AND METHOD

The study was carried out at the area private house in Qaladza/ Sulaimany/ IRAQ at October 2016, to investigate the effect of two different types of plants as a prebiotic at different concentration to investigate the health benefit on broiler chicks.

3.1. Source of Peppermint and Ginger as Prebiotics

Peppermint and Ginger root leaves were used in this study were obtained from Qaladza area in Sulaimany in Iraq. Leaves were washed, dried at room temperature then followed by grinding. 5 and 10g of each Peppermint and Ginger root were added separately per 1kg of the feed.

Table 3.1. Analysis of active compound in the tubers of Ginger by GC-MS

Peak no.	RT	Area %	Identified Compound
1	13.515	3.78	Sabinene
2	16.577	0.82	COPAENE<ALPHA->
3	17.258	1.64	SESQUITHUJENE<7-EPI->
4	19.644	2.40	GERMACRENE
5	20.187	1.36	Isocaryophillene
6	21.189	53.30	ZINGIBERENE <ALPHA->
7	22.499	26.03	CURCUMENE<AR->
8	23.752	1.59	3-CYCLOHEXENE-1-METHANOL, ALPHA
9	24.422	1.91	Isoborneol
10	25.600	0.63	delta-3-carene
11	26.144	0.27	CALACORENE<ALPHA->
12	27.059	1.35	Carvone
13	31.213	0.15	FUNEBRENE<ALPHA->
14	31.643	0.20	GURJUNENE<GAMMA->
15	32.793	0.17	ZONARENE
16	34.383	1.86	Eugenol
17	38.606	0.04	Isoeugenol
18	39.676	0.02	XANTHORRHIZOL

Table 3.2. Analysis of active compound in the tubers of peppermint by GC-MS

Peak no.	RT	Area %	Identified Compound
1	12.577	12.29	Limonene
2	13.069	11.61	CARENE<DELTA-3->
3	14.008	37.43	Eucalyptol
4	16.502	0.82	OCTANOL<3->
5	17.092	1.02	3-OCTANOL
6	17.578	1.24	BOURBONENE<BETA->
7	18.024	1.48	BOURBONENE<BETA->
8	19.375	2.56	cis-.alpha.-Bisabolene
9	20.273	6.43	beta-Caryophyllene
10	21.211	0.57	MUUROLA-3,5-DIENE<TRANS->
11	21.904	1.52	alpha.-Caryophyllene
12	23.008	0.46	BICYCLOGERMACRENE
13	23.718	1.46	TERPINEOL<ALPHA->
14	24.914	2.88	DIHYDRO CARVONE<CIS->
15	26.481	0.16	MENTHATRIENE<1,3,8-PARA->
16	27.271	16.84	Carvone
17	37.983	0.02	2-Allyl-4-methylphenol
18	40.506	0.01	NAPHTHALENONE
19	46.514	0.01	BENZOFURANONE

3.2. Experimental Design and Treatments

A total of 225 one-day old chicks were divided into 5 groups with 3 replicates; weighted and randomly housed in ground with wood shaves. Incessant lighting is provided throughout the experiment. The ambient temperature was slowly decreased from 30 C on day 7 to 25 C on day 21 and then kept constant. All the replication contained 15 birds and the the basal diets were fed through the experiment (starting from 7 to 21 days of age, grower from 21 to 35 days of age, and finishing from 35 to 42 days of age).

All treatments were conducted under the same environment including lighting and watering system in a cage house made by size of 100cm x 120cm for each replicate. All treatment groups were fed with same diets and reared in cage system for first week after hatch. Then at first day in a second week of age, supplementation dietary was provided as follows;

T1= Control group basal chicken diet (no additive)

T2= basal diet + 0.5% dried peppermint

T3= basal diet + 1% dried peppermint

T4= basal diet + 0.5% dried ginger root

T5= basal diet + 1% dried ginger root

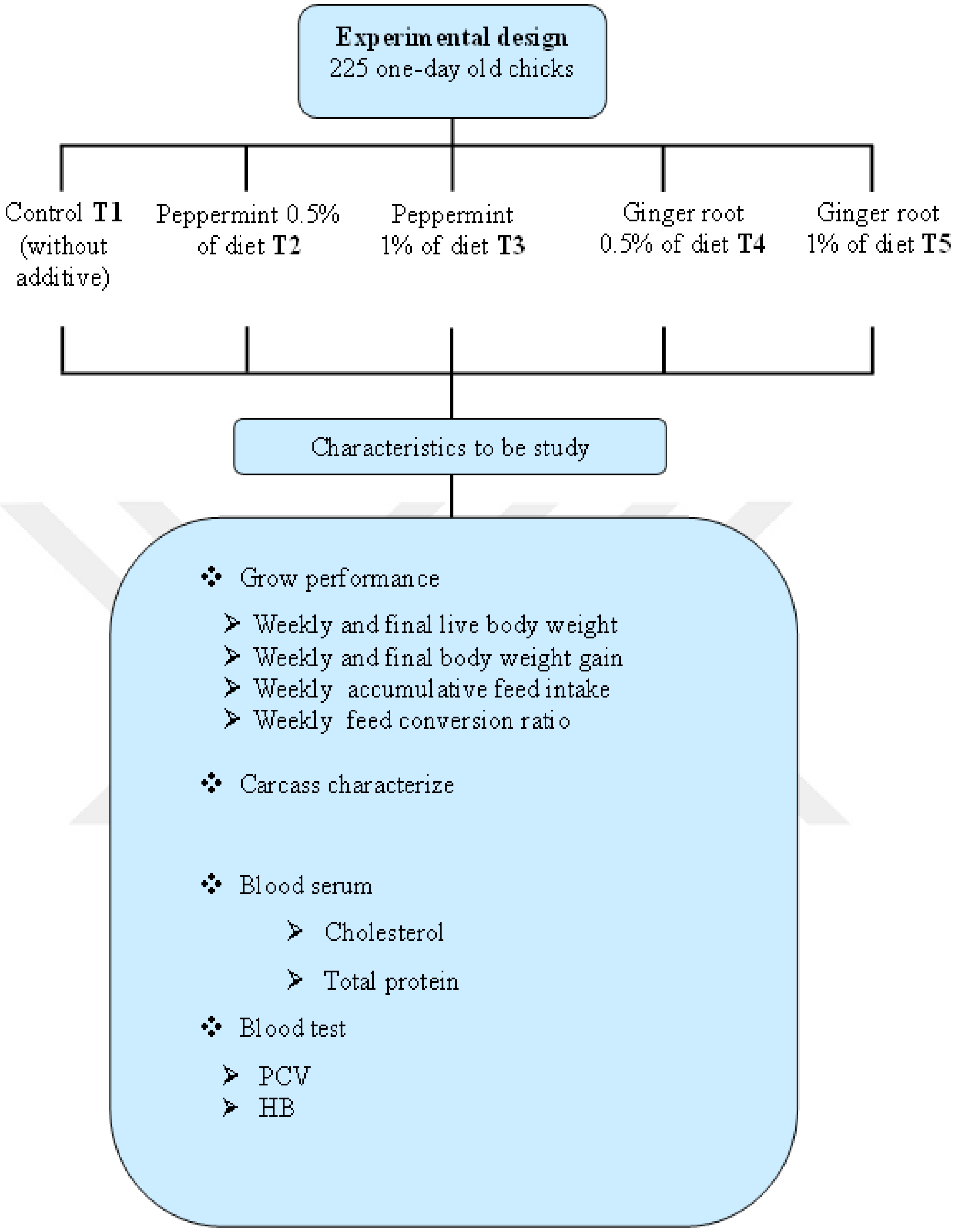

Figure 3.1. Layout of the feed experiment

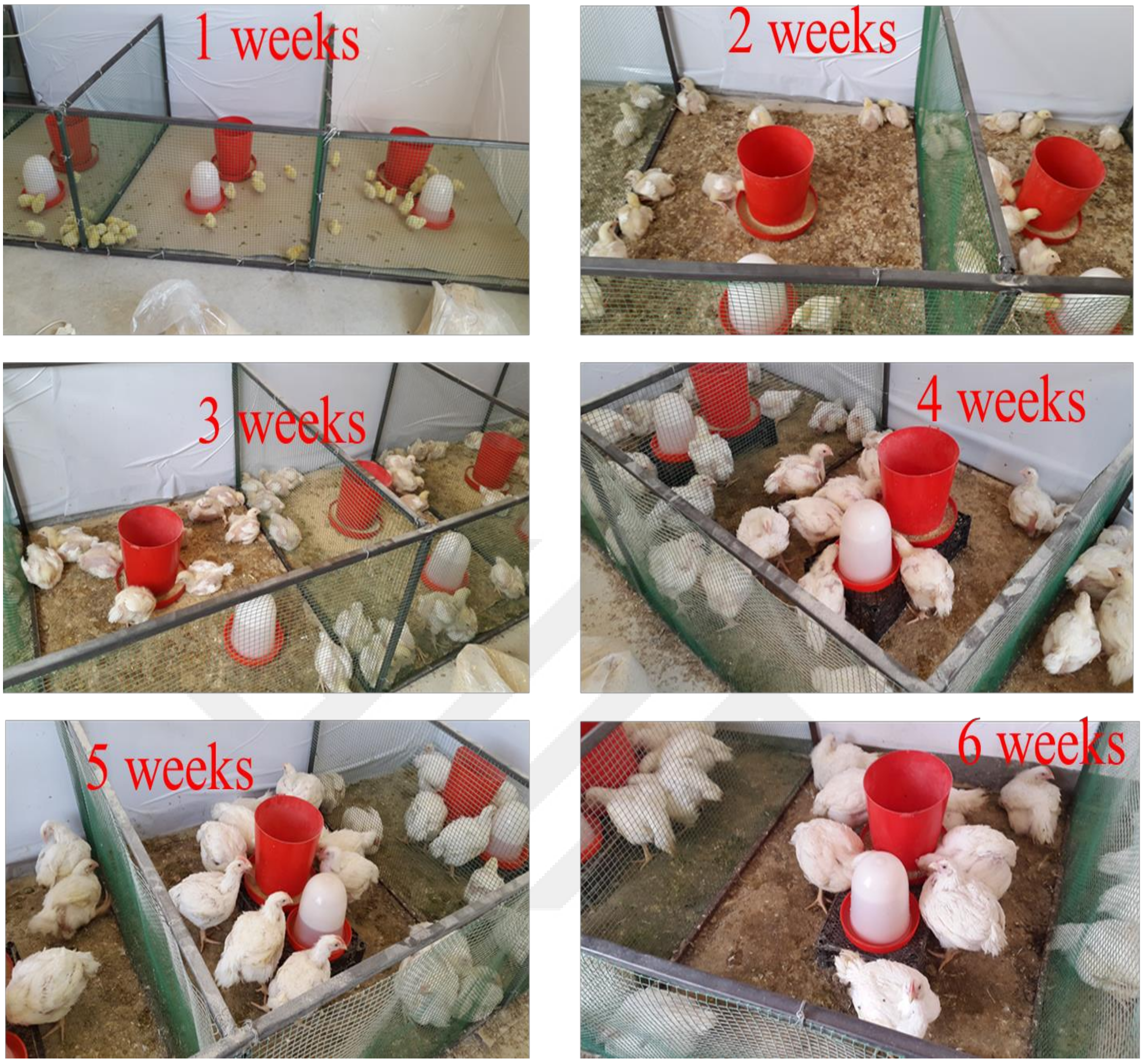

Figure 3.2. Chicks House located at animal farm which used in this study

3.3. Preparing Feed

The commercial diet was used contains 2900 kcal/kg and 23% CP to chicks for 1 day to 21 day and 21% CP in 22 day to 42 days.

3.4. Characteristics Studied

This study was conducted to investigate the effect of dietary Peppermint and Ginger supplementation on the growth performance and blood characterize.

3.5. The Performance Traits

3.5.1. Live Body Weight (LBW) and Body Weight Gain (BWG)

At one week old and at the end of each week, birds were weighted by a digital balance. The weight gain was calculated by using this equation:

Body weight gain = B.W at the end of week - B.W at the beginning of week.

3.5.2. Feed Intake (FI) and Feed Conversion Ratio (FCR)

During the 42 days' experimental period, growth performance was valued. Feed consumption was the amount of feed spent every week; it was calculated for each treatment at weekly basis. At the end of the week, the remaining amount of feed was weighed and reduced from the known weight of feed at the beginning of week. The product (consumed feed) was divided by the total number of birds.

Feed conversion ratio (FCR) was calculated at the end of experiment and it is the amount of feed consumed per unit of body weight gain (feed consumption (g)/ weight gain (g).

$$\text{Feed conversion ratio} = \frac{\text{FI during a feeding period}}{\text{Weight gain during the same period}}$$

3.5.3. Carcass Cuts Preparation and Sampling

At the finishing of experiment, a sample of 12 randomly selected birds (6 male and 6 female) from each replicate within a treatment was slaughtered to determine the dressing percentage. Before slaughtering, each bird was weighted and numbered and after that the birds were slaughtered, and carcass yield, breast, wings, legs, visceral organs (liver, heart,) lymphoid organs index (spleen) were measured.

3.5.4. Dressing Percentage

Dressing percentage was calculated by both methods with and without edible giblet using following equations:

$$\text{Dressing percentage without giblet} = \frac{\text{Carcass weight}}{\text{Live body weight}} \times 100$$

3.5.5. Blood Serum Analysis

In the end experiment day 42 of age selected two males and two females from each replicates and slaughtered with sterile tools. In order to prevent clotting, blood was collected in heparinized test tubes and centrifuged at 2,000 rpm for 10 minutes and then the serum was separated, then stored at -20°C until transferred to laboratory and assayed to measuring by spectrophotometer and calculated serum cholesterol , total protein level by

$$\text{Serum cholesterol level} = \frac{\text{Absorbance of test}}{\text{Absorbance of standard}} \times \text{Concentration of Standard}$$

Figure 3.3. The machine spectrophotometer to cholesterol and total protein test

3.5.6. Blood PCV and HB Test

In the day 42 of age selected two males and two females from each replicates and slaughtered with sterile tools. The packed cell volume (PCV) can be determined by centrifuging heparinized blood in a capillary tube (also known as a micro hematocrit tube) at 10,000 RPM for five minutes. This separates the blood into layers. The volume of packed red blood cells divided by the total volume of the blood sample gives the PCV.

3.6. Statistical Analysis

Data obtained were statistically analyzed using one-way analysis of variance SAS software 2001. The experiment executed as a complete randomized design (CRD), the data analyzed by using the CRD (Completely Randomized Design) of (SAS 2001). Duncan`s multiple range tests were used to compare differences among treatments means (Duncan 1955). The statistical model:

$Yij = \mu + tj + eij$

Where: Yij = represent the observation value which affected by ith treatment (feed supplement) that found within jth replicate. μ = general mean of population.

ti = represent the effect of ith treatment. Eij = represent the experimental error.

4. RESULT

Table 4.1. Effect of dietary prebiotics supplementation on weekly and final live body weight (g) of male broiler (Means± standard error)

Day	G.	T1: control	T2 : 0.5% peppermint	T3: 1% peppermint	T4: 0.5% ginger	T5: 1% ginger	Sig.	Sem
1 week	**Male**	203.83ab	202.57ab	214.89b	207.85ab	199.63a	*	±5.14
2 week	**Male**	464.83c	433.95b	434.95b	419.05 ab	398.74a	**	±10.49
3 week	**Male**	955.5c	895.05b	842.74ab	871.5b	788.95a	**	±22.47
4 week	**Male**	1349.79	1444.81	1374.91	1339.95	1349.13	NS	± 67.36
5 week	**Male**	1689.1	1715.3	1587.5	1608.7	1721.7	NS	±108.4
6 week	**Male**	2032.75	1946.1	1792.57	1938.45	1960.13	NS	±154.1

Horizontal T1: control, T2: 0.5% Peppermint, T3: 1% Peppermint, T4: 0.5% Ginger, T5: 1% Ginger.

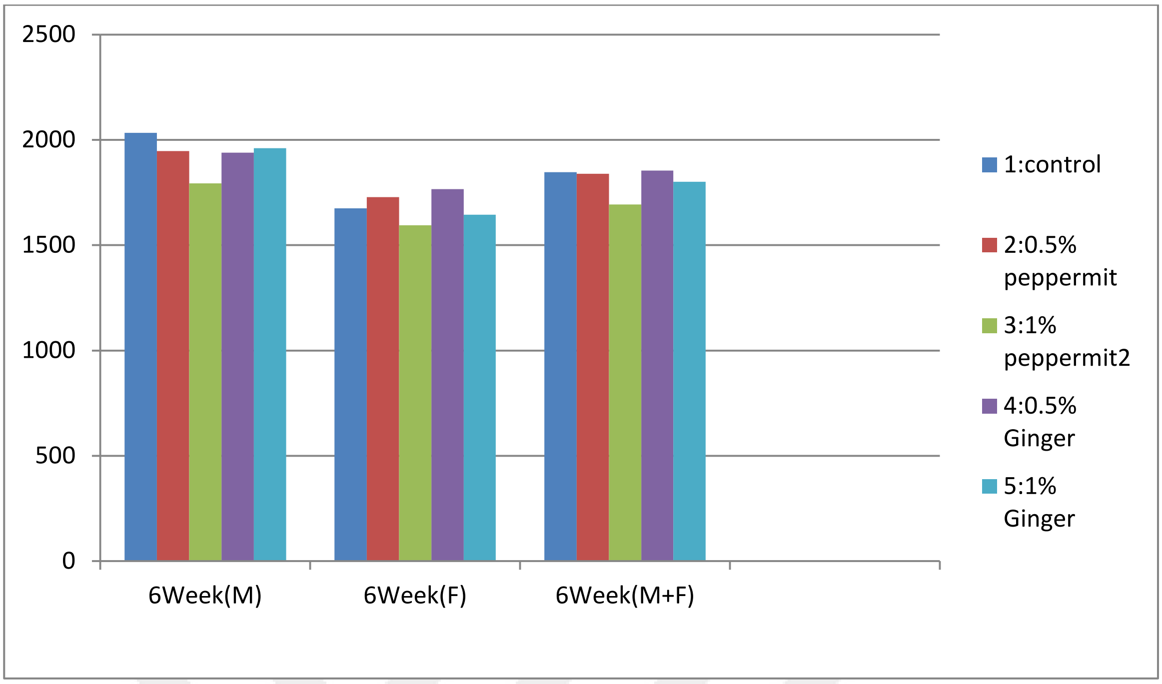

Figure 4.1. Final live body weight in male chickens

4.1. Live Body Weight in Male Broiler

In the present study the effects of herbal feed additives on live body weight of male broiler chicks during 7^{th}, 14^{th}, 21^{th}, 28^{th}, 35^{th} and 42^{nd} days of ages period were presented in Table 1. Live body weights (LBW) were improved ($p<0.05$) by feeding the diets containing 1% of Peppermint leaves powder (T3), 1% of Ginger powder (T4), and 1% of the Ginger (T5) in comparing to control (T1) at the end of fattening period. The birds fed the diet containing 0.5% of Peppermint leaves powder (T2) had lower live body than T1. However, the differences were significant.

From the results given in experiment it can be seen that the dietary supplementation of herbal has statistically significant effect on LBW in all fattening periods of broiler chickens. There was a significant ($p<0.05$) difference between treatment groups (T2, T3, T4, T5) and control group at 14 day of age. The highest and lowest live body weight was observed in group T1 (464.83 g) and T5 (398.74 g), respectively.

There was a significant ($p<0.05$) difference between treatments (T2, T3, T4) and control groups at the 21st day of age. And with decreasing of live body weight in group (T5) was significant ($p<0.05$) in comparing to control group. The broilers had significantly higher LBW in group T1 (955.5 g) than other groups and the lowest was in group T5 (788.95 g).

At age of 28 days, birds feed by supplemented with the herb (T1, T2, T3, T5) had higher LBW than T4. There was no significant ($P<0.05$) difference between all groups. However, the mean value of LBW for the birds in T4 had lower LBW than T1 ($P<0.05$). The highest and the lowest live body weight were observed in group T2 (1444.81g) and T4 (1339.95 g).

The LBW were higher in all treatment groups (T1, T2, T4, and T5) than T3. The differences were not significant ($P<0.05$) between all treatments at day 35th of age. The highest and lowest results in LBW were noted in the group T5 (1721.7 g) and T3 (1587.5 g), respectively.

In the final period at 42 day of age, in terms of LBW, there was not significant ($p<0.05$) differences between all treatments groups. The highest and lowest results in live body weight were in the group T1 (2032.75 g) and T3 (1792.57 g) respectively.

Table 4.2. Effect of dietary prebiotics supplementation on weekly and final live body weight (g) of female broilers (Means± standard error

Day	G.	T1: Control	T2 : 0.5% Peppermint	T3: 1% Peppermint	T4: 0.5% Ginger	T5: 1% Ginger	Sig.	Sem
1 week	**Female**	197.95ab	193.27a	206.21b	201.50b	198.90ab	**	±2.09
2 week	**Female**	439.33 b	405.04 a	412.52 ab	408.04a	398.7 a	**	±10.20
3 week	**Female**	857.66 b	811.9 ab	780.73 ab	812.22 ab	757a	*	±31.07
4 week	**Female**	1268.04	1354.69	1284.2	1367.7	1345.07	NS	±49.88
5 week	**Female**	1522.41	1578.26	1375.12	1521.75	1491.42	NS	±105.4
6 week	**Female**	1674.77	1728.3	1594.57	1765.22	1643.8	NS	±135.9

Horizontal T1: control, T2: 0.5% Peppermint, T3: 1% Peppermint, T4: 0.5% Ginger, T5: 1% Ginger.

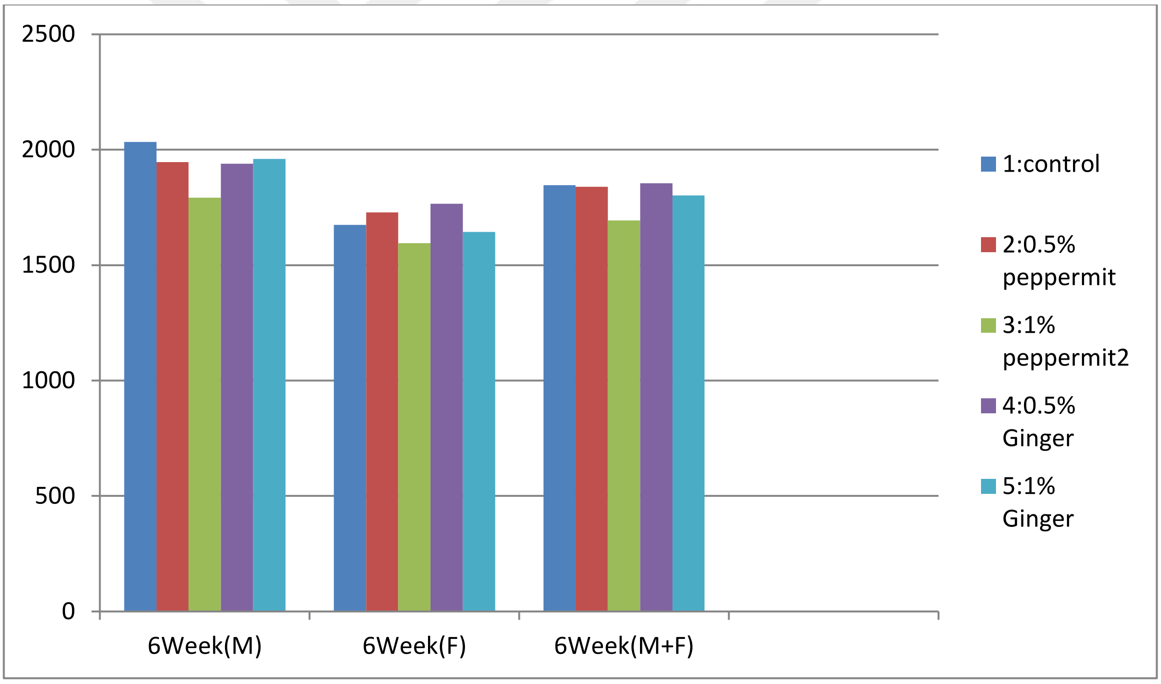

Figure 4.2. Final live body weight in female chickens

4.2. Live Body Weight in Female Broiler

In the present study the effects of herbal feed additives on live body weight of female broiler chicks during 7th, 14th, 21th, 28th, 35th and 42nd days of ages period were presented in Table 2. Live body weights (LBW) were improved ($p<0.05$) by feeding the diets containing 1% of Peppermint leaves powder (T3), 1% of Ginger powder (T4), and 1% of the Ginger (T5) in comparing to control (T1) at the end of fatting period. The birds fed the diet containing 0.5% of Peppermint leaves powder (T2) had lower live body than T1. However, the differences were significant.

From the results given in experiment it can be seen that the dietary supplementation of herbal has statistically significant effect on LBW in all fattening periods of broiler chickens. There was a significant ($p<0.05$) difference between treatment groups (T2, T3, T5) and control group at day 14 of age. The highest and lowest live body weight was observed in group T1 (439.33 g) and T5 (398.94g), respectively.

There was a significant ($p<0.05$) difference between treatments (T2, T3, T4) and control groups at the 21st day of age. And with decreasing of live body weight in group (T5) was significant ($p<0.05$) in comparing to control group. The broilers had significantly higher LBW in group T1 (857.66g) than other groups and the lowest was in group T5 (757 g).

At age of 28 days, birds feed by supplemented with the herbs (T2, T4, T5) had higher LBW than T1. There was no significant ($P<0.05$) difference between all the groups. However, the mean value of LBW for the birds in T1 had lower LBW than T3 ($P<0.05$). The highest and lowest live body weight was found in group T4 (1367.7 g) and T1 (1268.04 g), respectively.

The LBW were higher in all treatment groups (T2, T4, and T5) than T3. The differences were not significant ($P<0.05$) between all treatments at day 35th of age. The highest and lowest results in LBW were noted in the group T2 (1578.26 g) and T3 (1375.12 g), respectively.

In the final period at 42 day of age, in terms of LBW, there were no significant ($p<0.05$) differences between all treatments groups. The highest and lowest results in live body weight were in the group T4 (1765.22 g) and T3 (1594.57 g) respectively.

Table 4.3. Effect of dietary prebiotics supplementation on weekly and final live body weight (g) of male and femal broiler (Means± standard error

Day	G.	T1: Control	T2 : 0.5% Peppermint	T3: 1% Peppermint	T4: 0.5% Ginger	T5: 1% Ginger	Sig.	Sem
1 week	**M+F**	200.91a	197.81a	210.55b	204.67ab	199.33a	**	±2.63
2 week	**M+F**	451.52 c	419.08ab	423.73 b	413.7 ab	398.94 a	**	± 7.30
3 week	**M+F**	904.39 c	852.89 bc	811.73 ab	842.05b	773.42 a	**	± 18.63
4 week	**M+F**	1306.45	1398.18	1329.55	1355.61	1347.65	NS	±40.46
5 week	**M+F**	1605.67	1647.81	1481.32	1567.08	1605.71	NS	±75.08
6 week	**M+F**	1846.23	1838.48	1693.57	1853.72	1801.14	NS	±103.8

Horizontal T1: control, T2: 0.5% Peppermint, T3: 1% Peppermint, T4: 0.5% Ginger, T5: 1% Ginger.

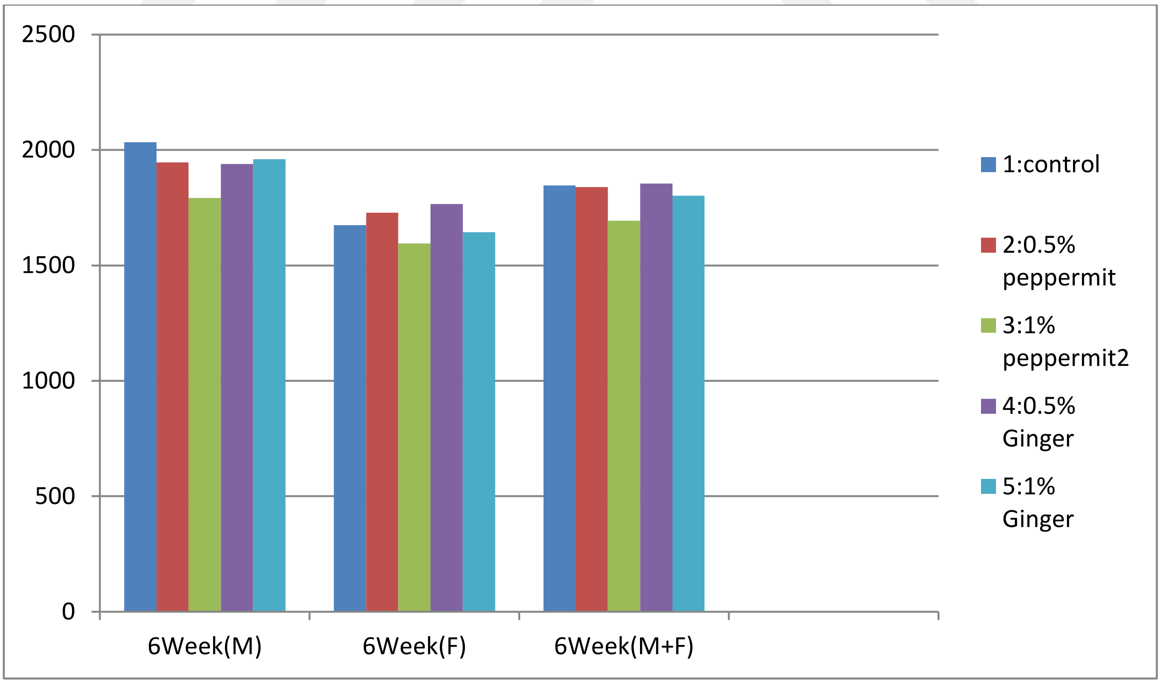

Figure 4.3. Final live body weight in male and female chickens

4.3. Live Body Weight in Male and Female Broiler

In the present study the effects of herbal feed additives on live body weight of male and female broiler chicks during 7th, 14th, 21th,28th, 35th and 42nd days of ages period were presented in Table 3. Live body weights (LBW) were improved ($p<0.05$) by feeding the diets containing 1% of Peppermint leaves powder (T3), 1% of Ginger powder (T4), and 1% of the Ginger (T5) in comparing to control (T1) at the end of fatting period. The birds fed the diet containing 0.5% of Peppermint leaves powder (T2) had lower live body than T1. However, the differences were significant.

From the results given in experiment it can be seen that the dietary supplementation of herbal had statistically significant effect on LBW in all fattening periods of broiler chickens. There was a significant ($p<0.05$) difference between treatment groups (T2, T4, T5) and control group at day 14 of age. The highest and lowest live body weight was observed in group T1 (451.52 g) and T5 (398.94 g), respectively.

There was a significant ($p<0.05$) difference between treatments (T2, T3, T4) and control groups at the 21st day of age. And with decreasing of live body weight in group (T5) was significant ($p<0.05$) in comparing to control group. The broilers had significantly higher LBW in group T1 (904.39 g) than other groups and the lowest was in group T5 (773.42 g).

At age of 28 days, birds fed by supplemented with the herb (T2, T3, T4, T5) had higher LBW than T1. There was no significant ($P<0.05$) difference between all groups. However, the mean value of LBW for the birds in T3 had lower LBW than T1 ($P<0.05$). The highest and lowest live body weight was found in group T2 (1398.18 g) and T1 (1306.45 g), respectively.

The LBW were higher in all treatment groups (T1, T2, T4, and T5) than T3. The differences were not significant ($P<0.05$) between all treatments at day 35th of age. The highest and lowest results in LBW were noted in the group T2 (1647.81 g) and T3 (1481.32 g), respectively.

In the final period at 42 day of age, in terms of LBW, there was no significant ($p<0.05$) differences between all treatments groups. The highest and lowest results in live body weight were in the group T4 (1853.72 g) and T3 (1693.57 g) respectively.

Table 4.4. Effect of dietary prebiotics on weekly and final feed conversion ratio of broiler (Means± standard error)

Treatment	T1: Control	T2:0.5% Peppermint	T3: 1% Peppermint	T4: 0.5%Ginger	T5: 1%Ginger	Sig.	Sem
0-1 Weeks	1.06	0.93	0.95	0.93	0.95	NS	±0.05
0-2 Weeks	1.04	1.04	1.06	1.08	1.09	NS	±0.04
0-3 Weeks	1.23 a	1.27 a	1.36 ab	1.28 ab	1.41b	*	±0.04
0-4 Weeks	1.43	1.36	1.36	1.36	1.38	NS	±0.03
0-5 Weeks	1.58 b	1.5 a	1.51 ab	1.51 a	1.47a	**	±0.02
0-6 Weeks	1.71	1.61	1.63	1.64	1.61	NS	±0.03

Horizontal T1: control, T2: 0.5% Peppermint, T3: 1% Peppermint, T4: 0.5% Ginger, T5: 1% Ginger.

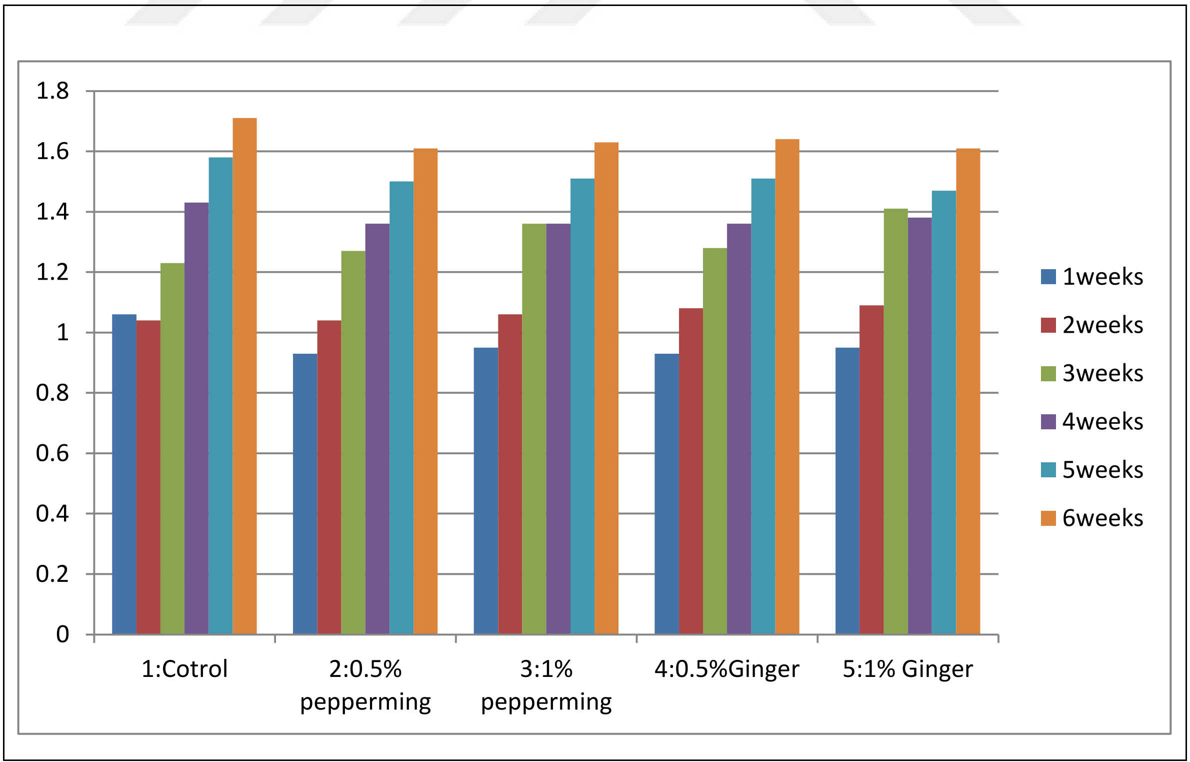

Figure 4.4. Feed conversion ratio

4.4. Feed Conversion Ratio

Weekly feed conversion ratio (FCR) of broilers in different treatments was illustrated in Table 4. It was noted that FCR was not affected significantly (P>0.05) by the treatment groups (T2, T3, T4, T5) received additives feed comparing to control group at 14 days of age. The highest value of FCR was observed in T5 (1.09) and the lowest FCR was detected in T1 and T2 (1.04).

At 21 days of age, the bottom line is that all treatments (T2, T3, T4, T5) had a significant effect (P>0.05) on FCR in comparing to control group during the period of experiment. The highest value of FCR was observed in T5 (1.41) and the lowest FCR was detected in T1 (1.23).

According to the data, also there were not significant (P>0.05) differences between all treatment in FCR at 28 days of ages. The better FCR value (1.36) was obtained in group T2, T3 and T4 that because of feed supplement Peppermint leaves powder presented in T2 and T3.

FCR for broilers at 35 days of ages was varied significantly (P<0.05) depending on herbal fed as supplements, so herb for birds fed on each groups (T2, T4, T5) decreased FCR significantly in comparing to control group. T5 had the lowest FCR value (1.47) P<0.05) as compared to T1 with the highest value (1.58).

In the final stage at 42 days of age, all treatments (T2, T3, T4, T5) had not significantly (p<0.05) .The highest and lowest in FCR of broilers was observed in group T1 (1.71) and T5 (1.61), respectively.

Table 4.5. Effect of dietary prebiotics supplementation on weekly and final feed intake (g) of broiler (Means± standard error)

Treatment	T1: Control	T2: 0.5% Peppermint	T3: 1% Peppermint	T4: 0.5% Ginger	T5:1% Ginger	Sig.	Sem
0 – 7 day	214.64	183.98	201.32	191.99	195.04	NS	±12.22
0 – 14 day	480.66	435.53	446.65	447.55	449.64	NS	±18.32
0 – 21 day	1165.9 b	1075.53 a	1102.21± ab	1083.74 a	1114.64ab	*	±23.34
0 – 28 day	2001.85	1906.72	1921.57	1892.78	1910.96	NS	±36.11
0 – 35 day	2741.1 b	2591.04 a	2594.42 a	2612.04ab	2553.71a	*	±46.35
0 – 42 day	3467.7	3296.59	3358.3	3386.71	3329.28	NS	±66.92

Horizontal T1: control, T2: 0.5% Peppermint, T3: 1% Peppermint, T4: 0.5% Ginger, T5: 1% Ginger.

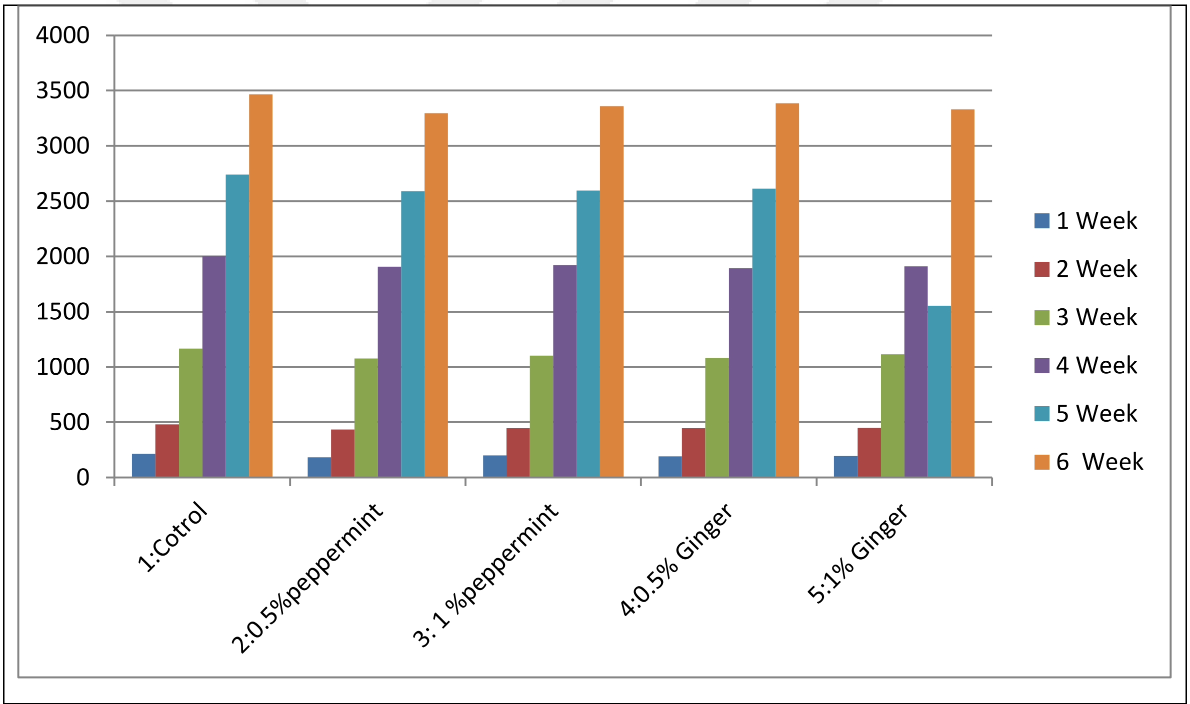

Figure 4.5. Feed intake

4.5. Feed Intake

The daily accumulative feed intake (FI) of broiler chicks during 7th, 14th, 21th, 28th, 35th and 42nd days of age's period were presented in (Table 4.5).

The birds were fed by supplemented herbal plant at age of 14 days, treatments groups (T2, T3, T4, T5) had not significant differences in comparing to the control group. However, FI in group T2 was decreased by feed additive in comparing to control group with the lowest value (435.53 g) but it was not significant.

According to the results given in experiment at 21 days of age, the dietary supplementation of herbal did affect ($P>0.05$) the FI in the treatment groups (T3, T5). But it did ($p<0.05$) in T4. The differences between T2 and T4 with the lowest value (1075.53 g) were significant ($P<0.05$).

Results were observed at 28 days of age's periods, where there was no significant FI between the all treatment groups. However, the lowest FI in the experiment was observed in group T2 with (1906.72 g) and T4 (1892.78 g) at both fattening period respectively.

Results of this study also indicated that it was not possible to observe significant difference between the treatment groups (T2, T3, T5) and control one in terms of FI at 35 days of age. On the other hand, the differences between T4 and control were significant ($P<0.05$) as in earlier age. There was no significant FI between the different herbal powders in groups (T2, T3, T5) and control group in broiler chickens. The highest and lowest FI were observed in group T1 (2741.13 g) and T5 (2553.71 g), and the no differences were significant ($P<0.05$).

Results were observed final experiment at 42 days of age's periods, where there was not significant FI between the all treatment groups. However, the highest and lowest FI were observed in group T1 (3467.78 g) and T2 (3296.59 g).

Table 4.6. Effect of dietary prebiotics on carcass characterize of male broiler at the end of experiment (Means± standard error)

Treatment	T1	T2	T3	T4	T5	Sig.	Sem
B.Weight	2149.16	2090.83	2165.83	2075	2113.33	NS	±66.37
Dressing%	0.79 a	0.81 ab	0.79 ab	0.83 b	0.82 b	**	±0.01
Carcass	1700.83	1697	1731.16	1742.83	1744.33	NS	±56.31
Breast	591	595	598.5	613	625	NS	±28.23
Wing	189.5	194	194.16	199.16	202.5	NS	±8.66
Leg	478.83	491.5	499.16	504.33	496	NS	±19.78
Liver	63.16 ab	58.16 a	64 ab	70 b	66.33ab	*	±3.11
Heart	12.5	13.83	12.5	13.5	13.83	NS	±1.02
Spleen	5.33	6	5.33	6.33	5.5	NS	±0.51

Horizontal T1: control, T2: 0.5% Peppermint, T3: 1% Peppermint, T4: 0.5% Ginger, T5: 1% Ginger.

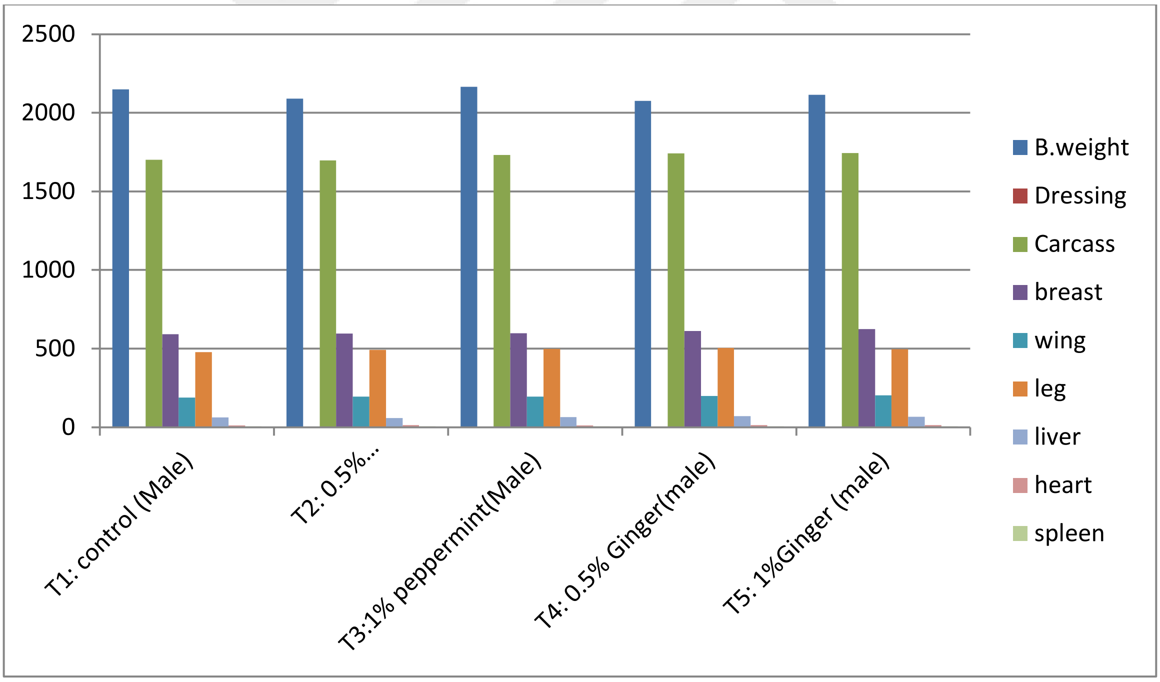

Figure 4.6. Carcass characterize in male chicken

4.6. Carcass Characterize in Male Chicken

The results in the Table 6 showed that effect of two different types with two levels of prebiotics on carcass in male broiler chicks during the experiment. There was no significant (P<0.05) difference among all treatments except dressing percentage and liver. While, the carcass weight of all dietary additive supplementations mathematically was improved if compared with control group, except the peppermint at 0.5% level in male broiler chicks.

Acording this table, the best result on body weight compared control group, the highest weight was obtained from T3 (2165.83 g). While, the lowest weight was recorded in T4 (2075 g). Respectively, in terms of dressing percentage there were significantly (P<0.05) differences between T4 and T5 as compering to control group. And with highest value was recorded from T4 (0.83) and the lowest value (0.79) was recorded from control group. As the showed in this table, the expressions of carcass yield parameter, there were no significantly (P<0.05) differences between all treatment groups as compering to control group, and with highest value from T5 (1744.33 g) than in comparing to control group. And also the lowest value was in T2 (1697 g).

Birds under the T4 treatment presented the highest legs (504.33 g), but there were no significantly (P<0.05) difference as compared to the other treatments and control group.

From the results given in experiment it can be seen that the breast weight was recorded with any significant influences in all observed treatments in comparing to control group.

In terms of Wings, there were no differences between all treatments as compering to control group. The highest and lowest wing weight was observed in group T5 (202.5 g) and T1 (189.5 g).

Internal organs in treatments were illustrated in Table (6). According to the data, there were significant (P>0.05) difference in terms of the liver weight between treatments (T1, T2, T3, T5) and control group. However, there was a numerical difference among the tested treatments. The highest liver weight was observed in T4 (70 g) and the lowest one in T2 (58.16 g) and the differences were significant (P<0.05).

The results indicated that weight of heart was no significantly ($p<0.05$) higher (13.83g) in group T5. There were no significant ($p<0.05$) differences in heart between all treatment groups. The lowest heart weight was recorded in control group with (12.5 g).

The relative weight of spleen was not affected by fed additive in all treatments groups comparing to control group, the highest weight was recorded from T4 (6.33 g) and the lowest was recorde from control group (5.33 g).

Table 4.7. Effect of dietary prebiotics on carcass characterize of female broiler at the end of experiment (Means± standard error)

Treatment	T1: Control	T2:0.5% Peppermint	T3:1% Peppermint	T4:0.5% Ginger	T5:1% Ginger	Sig.	Sem
Gender	**Female**	**Female**	**Female**	**Female**	**Female**		
B. weight	1797.5	1811.66	1804.66	1852.5	1838.33	NS	±32.14
Dressing%	0.8	0.77	0.76	0.76	0.78	NS	±0.02
Carcass	1446.66	1405.33	1389.33	1418.83	1436.16	NS	±50.01
Breast	469.5	460.66	471.5	478.5	479.66	NS	±35.61
Wing	167.33	171.5	169.16	169.33	177.83	NS	±6.38
Leg	418.5	401	384.83	386.16	394.33	NS	±14.95
Liver	60.33 b	54 ab	50.66 a	54.66 ab	59.33 b	*	±2.78
Heart	12.33	12.5	12.5	12.83	12.5	NS	±0.75
Spleen	4.5	4.66	4.66	5.33	5.16	NS	±0.36

Horizontal T1: control, T2: 0.5% Peppermint, T3: 1% Peppermint, T4: 0.5% Ginger, T5: 1% Ginger.

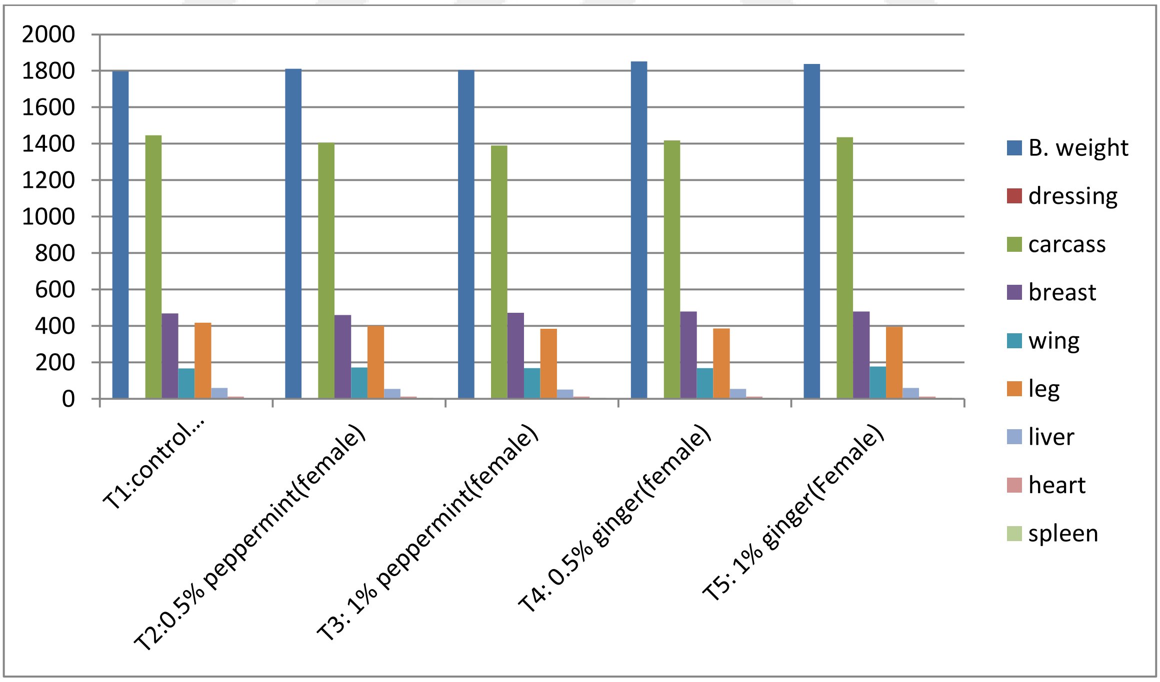

Figure 4.7. Carcass characterize in female chicken

4.7. Carcass Characterize in Female Chicken

Dietary supplementation of 0.5% and 1% of Peppermint leaves powder, 0.5% and 1% of Ginger powder. The control group (T1) which hadn't received any herbal feed additives. The result in the Table (7) showed that effect of two different types with two levels of prebiotics on carcass in female broiler chicks during the experiment. There was no significant ($P<0.05$) difference among all treatments except liver. While, the carcass weight of all dietary additive supplementations mathematically was improved if compared with control group, except the peppermint at (1%) level in female broiler chicks.

Acording this table best result body weight compared control group the highest weight has been obtained from T4 (1852.5 g). while, the lowest weight was recorded in T1 (1797.5 g). Respectively dressing percentage there were no significantly ($P<0.05$) effects differences between all treatments as compering to control group. And with highest value was recorded from T1 (0.80) and the lowest value was recorded from T3 (0.76).

As the showed in this table, the expressions of carcass yield parameter there were no significantly ($P<0.05$) effects differences between all treatment groups as compering to control group, and with highest value from T1 (1446.66 g) than in comparing to control group. and also the lowest value in T3 (1389.33 g).

Birds under the T1 treatment presented the highest legs (418.5 g) there were no significantly ($P<0.05$) difference as compared to the other treatments and control group.

From the results given in experiment it can be seen that the Breast hadn't recorded any significant influences for all observed treatments in comparing to control group.

In terms of Wings, there were no differences between all treatments as compering to control group significantly. The highest and lowest wing weight was observed in group T5 (177.83 g) and T1 (167.33 g).

Internal organs in treatments were illustrated in table (7) According to the data, there were significant ($P>0.05$) difference in terms of the liver weight between treatments (T1, T2, T4, T5) and T3. The highest liver weight was observed in T1 (60.33 g) and the lowest one was in T3 (50.66 g) and the differences were significant ($P<0.05$).

The results indicated that weight of heart was not significantly ($p<0.05$) higher (12.83 g) in group T4. There were no significant ($p<0.05$) differences in heart between all treatment groups. The lowest heart weight was recorded in control group with (12.33 g).

The relative weight of spleen was not affected by fed additive in all treatments groups comparing to control group, the highest weight was recorded from T4 (5.33 g) and the lowest was record from control group (4.5 g).

Table 4.8. Effect of dietary prebiotics on carcass characterize of male and female broiler at the end of experiment (Means± standard error)

Treatment	T1: Control	T2:0.5% Peppermint	T3:1% Peppermint	T4:0.5% Ginger	T5:1% Ginger	Sig.	Sem
Gender	M+F	M+F	M+F	M+F	M+F		
B. weight	1973.33	1951.25	1985.25	1963.75	1975.83	NS	±57.56
Dressing%	0.79	0.79	0.78	0.8	0.8	NS	±0.01
Carcass	1573.75	1551.16	1560.25	1580.83	1590.25	NS	±58.39
Breast	530.25	527.83	535	545.75	552.33	NS	±29.49
Wing	178.41	182.75	181.66	184.25	190.16	NS	±6.36
Leg	448.66	446.25	442	445.25	445.16	NS	±19.36
Liver	61.75	56.08	57.33	62.33	62.83	NS	±2.48
Heart	12.41	13.16	12.5	13.16	13.16	NS	±0.61
Spleen	4.91	5.33	5	5.83	5.33	NS	±0.33

Horizontal T1: control, T2: 0.5% Peppermint, T3: 1% Peppermint, T4: 0.5% Ginger, T5: 1% Ginger.

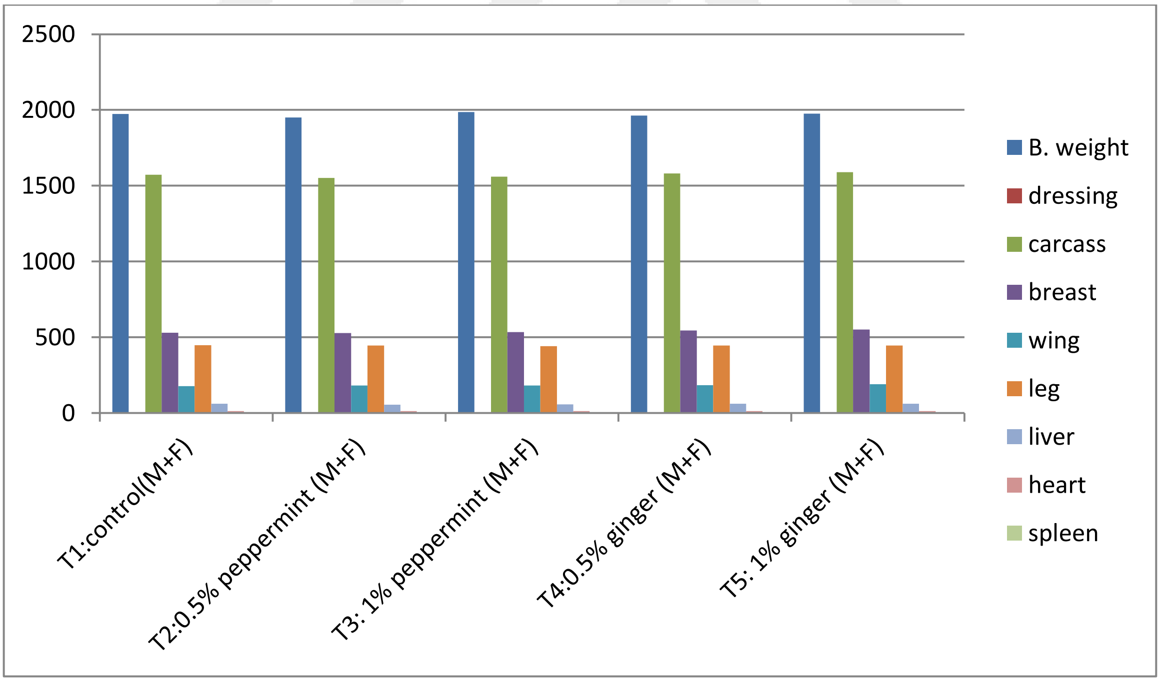

Figure 4.8. Carcass characterize in male and female chicken

4.8. Carcass Characterize in Male and Female Chicken

The result in the Table (8) showed that effect of two different types with two levels of prebiotics on carcass in male and female broiler chicks during the experiment. There was no significant (P<0.05) difference among all treatments. While, the carcass weight of all dietary additive supplementations mathematically was improved if compared with control group, except the peppermint at 0.5% level in male and female broiler chicks.

Acording this table, the best result in body weight compared control group, the highest weight was obtained from T3 (1985.25 g). while, the lowest weight was recorded in T2 (1951.25 g). In trms of dressing percentage, there were no significantly (P<0.05) differences between all treatments as compering to control group. And with highest value was recorded from T5 (0.80) and the lowest value was recorded from T3 (0.78).

As the showed in this table, the expressions of carcass yield parameter there were no significantly (P<0.05) differences between all treatment groups as compering to control group, and with highest value from T5 (1590.25 g) than in comparing to control group. and also the lowest value in T2 (1551.16 g).

Birds under the T1 treatment presented the highest legs (448.66 g) there were no significantly (P<0.05) difference as compared to the other treatments and control group.

From the results given in experiment it can be seen that the breast was not recorded with any significant influences for all observed treatments in comparing to control group.

In terms of wings, there were no differences between all treatments as compering to control group. The highest and lowest wing weight was observed in group T5 (190.16 g) and T1 (178.41 g).

Internal organs in treatments were illustrated in this table (8) According to the data, there were no significant (P>0.05) difference, in terms of the liver weight, between treatments (T2, T3, T4, T5) and control group. However, the highest liver weight was observed in T5 (62.83 g) and the lowest one was in T2 (56.08 g). The results indicated that weight of heart was not significantly (P>0.05) higher (13.16g) in group T5. There were no significant (p<0.05) differences in heart between all treatment groups. The lowest heart weight was recorded in control group with (12.41 g).

The relative weight of spleen was not affected by fed additive in all treatments groups comparing to control group, the highest weight was recorded from T4 (5.83 g) and the lowest was record from control group (4.91 g).

Table 4.9. Effect of dietary prebiotics on blood parameter at 42 days of age of broiler (Means± standard error)

Treatment	T1: Control	T2:0.5% Peppermint	T3: 1% Peppermint	T4: 0.5% Ginger	T5: 1% Ginger	Sig.	Sem
Cholesterol	150.33 ab	154.33 ab	141.5 a	188.58 b	171.58b	**	±10.10
Total protein	3.05 a	3.29 ab	3.31 ab	3.36 ab	3.61b	*	±0.18
PCV	25.91	27.5	26.75	27.41	28	NS	±0.89
HB	7.97	8.45	8.22	8.43	8.61	NS	±0.27

Horizontal T1: control, T2: 0.5% Peppermint, T3: 1% Peppermint, T4: 0.5% Ginger, T5: 1% Ginge.

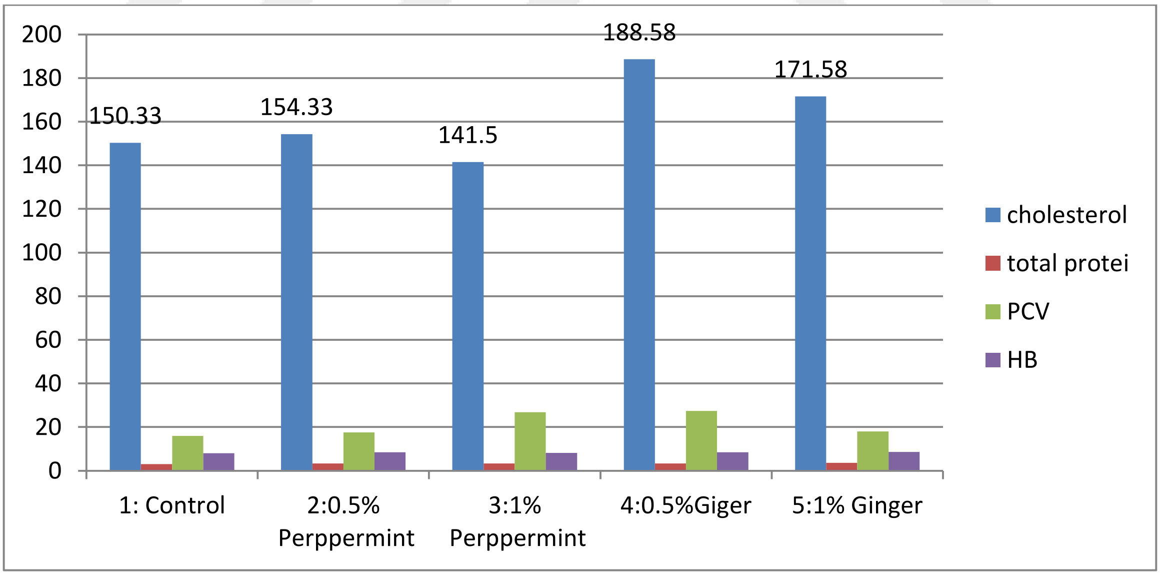

Figure 4.9. Blood parameter

4.9. Blood Parameters

The result in Table (9) shows that the cholesterol and total protein concentration of broiler at the end of the experiment. There was significant (P>0.05) differences between all the additives supplementation and compared with control group. In terms of the PCV and HB, there was no- significant (P>0.05) differences between all the additives supplementation and compared with control group.

Total protein of broilers chickens showed similar to that of glucose, so all treatments (T2, T3, T4, T5) had the worst values in comparing to control group. Birds fed additive in group T5 had the highest value in the terms of total protein (3.61 mg/dl) as compared to control group with the lowest value (3.05 mg/dl).

The effects of two natural feed additives in broiler diets on blood lipids parameters were summarized in Table (9). Cholesterol blood lipid had a significant (P<0.05) differences by additives diets in a treatments (T4, T5) as compared to control group. The highest one in the terms of cholesterol was detected in group T4 (188.58 mg/dl) and lowest one was in group T3 (141.5 mg/dl). Thus, for PCV, HB, the highest level has been obtained in T5 (1% ginger). While, the lowest level in T1 control group.

5. DISCUSSION

5.1. Live Body Weight

In the present study the effects of herbal feed additives on live body weight of broiler chicks during 7th, 14th, 21th, 28th, 35th and 42nd days of ages period were presented in Table (1,2 and 3). Live body weights (LBW) were improved ($p<0.05$) by feeding the diets containing 1% of Peppermint leaves powder (T3), 1% of Ginger powder (T4), and 1% of the Ginger (T5) in comparing to control (T1) at the end of fattening period. The birds fed the diet containing 0.5% of Peppermint leaves powder (T2) had lower live body than T1, and the differences were significant ($P<0.05$). These results are in agreement with the findings of (Moorthy et al. 2009; Najafi and Torki 2010; Rahimi et al. 2011; Sadeghi et al. 2011; Mohamed et al. 2012) who mentioned that adding ginger into the broiler diet had a positive and significant effect on the live body weight of chicks while adding thyme powder or essential oil into the broiler`s diet or drinking water did not affect the live body weight. On the other hand, the results of the present study are in contrast to some of the previous observations that indicated herbs, especially ginger and their main components, did not affect live body weight in the broiler chicks (El-Deek et al. 2002; Al-Homidan, 2005; Ademola et al. 2009; Thayalini et al. 2011), while adding thyme powder or essential oil into the broiler`s diet or drinking water had a significant positive impact on the live body weight of broiler chickens (Al-Jugifi 2009; Toghyani et al. 2010; Al-Mashhadani et al. 2011; Foroughiet al. 2011).

The higher body weight was noted in the broilers fed ginger powder alone and peppermint (0.5% peppermint and 1% ginger) might be due to the beneficial effects of these herbs in animal nutrition which includes improvement of endogenous digestive enzyme secretion, activation of immune response antiviral, antioxidant and anthelmintic actions. All these actions cause improvement in health, growth and performance of broiler (Rahimi et al. 2011).

The main important compounds in Ginger (Zingiber officinale) are gingerol, gingerdiol and gingerdione which have the ability to stimulate digestive enzymes, affect the pathogenic microbial flora in the small intestine which complete the host for nutrients (Dieumou et al. 2009). All these positive effects lead to increase in production and improve animal's health (Bosisio et al. 1992) when used in broiler diets.

Herbal planet could stimulate the digestion system in poultry, increase the pancreatic digestive enzymes, and improve the function of liver. Improvement of the metabolism of herbal plant carbohydrates and proteins in the major organs would increase growth rate of these organs (Mellor 2000). The high content of peppermint in menthol, potassium, niacin, foliate, sugar, manganese, calcium, phosphor, carbohydrates, sodium, vitamins , soluble and insoluble fiber, minerals, fatty acids, amino acids, energy and omega3 (USDA 2012), thereby improving the consumption of feed, feed conversion efficiency, body weight and body gain also herbals because it content high percentage of fibers led to reduce the speed of the passage of food into the gastrointestinal tract and thereby increase the rate of digestion and absorption of feed materials (Kwropatcin 1982; Naji and Kabro 1999).

Ginger is important medicinal plant which is widely used all over the world. The main important compounds in Ginger (Zingiber officinale) are gingerdiol, gingerol and gingerdione which have the ability to stimulate digestive enzymes, affect the microbial activity (Dieumou et al. 2009) when used in broiler diets. Each medical and veterinary uses of antibiotics have resulted in the appearance of resistant types of bacteria. Resistant bacteria which are human pathogens may cause diseases that are difficult to treat even if the resistant bacteria are not human pathogens, they may still be dangerous because they can transfer their antibiotic resistance genes to other bacteria that are pathogenic (Taylor 1997; Barton 1998; Witte 1998; Wegener et al. 1999).

5.2. Feed Intake and Feed Conversion Ratio

Weekly feed conversion ratio (FCR) of broilers in different treatments was illustrated in Table (4). It was noted that FCR was not affected significantly (P>0.05) by the treatment groups (T2, T3, T4, T5) received additives comparing to control group. The daily accumulative feed intake (FI) of broiler chicks during 7th, 14th, 21th, 28th, 35th and 42nd days of age's period were presented in Table (5). Body weight and feed consumption were significantly reduced in birds in the heat stress group. Peppermint powder supplementation at the level of 1% reduced body temperature compared with the control group during heat stress period (P<0.05). Significant differences were detected between dietary treatments for the relative weights of carcass, breast and thigh at 35 days of age and breast, gizzard and liver relative weights at 42 days of age (P<0.05). Birds fed basal diet plus vitamin E had higher carcass weight than the control groups on 35 days. In general, the results of this study shown that peppermint powder as a natural antioxidant has useful effects on chicken growth performance, body temperature regulation and carcass and internal organ weights (Arab Ameri1 S., Samadi1 F., Dastar1 B. and Zarehdaran S. 2016).

Ali and Abed (2014) reported that the seemed there is an improvement in performance and immunity traits for all treated groups if compared with the control group. But, the chicks feed with 1% mint performed better than those fed with others concerning live body weight and body weight gain. With regards to feed consumption, the first treatment that supplemented with 1% mint completed better one. The second treatment that supplemented with 1% fenugreek recorded high antibody titter against Gambaro disease virus and Newcastle disease virus at 21 and 35 day of broilers age. From these results we can say that the dietary addition of herbs will improve the production and immunity in broiler chicks.

The results are in agreement with the findings of (El-Deek et al. 2002; Al-Homidan, 2005, Tekeli et al. 2006; Demirel et al. 2008; Moorthyet et al. 2009; Ademola et al. 2009; Najafi and Torki 2010; Toghyani et al. 2010; Kehinde et al. 2011; Abdulkarimi et al. 2011; Al-Mashhadani et al. 2011; Mansoub and Myandoab 2011; Foroughi et al. 2011; Rahimi et al. 2011) who concluded that dietary supplementation of broilers diets with ginger and thyme did not affect the feed consumption compared to the control group. In contrast, the results are in disagreement with the findings of researchers (Al-Jugifi, 2009; Tekeli et al. 2011; Herawati and Marjuk 2011; Mohamed et al. 2012; Arshad et al. 2012) who noted that using ginger and thyme powders in the broiler`s diets had a significant positive effect on appetite and feed consumption of broiler chicks. The reason for the lack of significant differences in feed consumption for the broiler chicks during the whole period of experiment may be due to absence of elements or components in each of ginger and thyme that effect on the bird appetite and then feed consumption.

These results agree with the previous results obtained from published by Herawati and Marjuk, (2011), Mohamed et al. (2012) who found that using dietary supplementation of ginger alone in broilers had a significant positive effect on the feed conversion ratio compared to the control. Again, these findings are consistent with researhers (Tekeli et al. 2006; Demir et al. 2008; Ocak et al. 2008; Najafi and Torki, 2010; Abdulkarimi et al. 2011; Rahimi et al. 2011; Sadeghi et al. 2011) who did not observe any significant improvements in the feed conversion ratio of broilers fed on diet or drank water containing thyme alone compared to the control group. On the other hand, the results are in disagreement with the findings of researches (El-Deek et al. 2002; Moorthy et al. 2009; Ademola et al. 2009; Thayalini et al. 2011; Kehinde et al. 2011; Tekeli et al. 2011) in where they did not observe any significant improvementsin the feed conversion ratio of broilers fed on diet containing ginger powder alone compared to the control group. Concerning the thyme powder, the results are in disagreement with the findings of (Al-Jugifi 2009; Al-Mashhadani et al. 2011; Foroughi et al. 2011) who found that using dietary supplementation of thyme in broilers had a significant positive effect on the feed conversion ratio compared to the control.

5.3. Carcass Characterize

The result in the Table (6,7and 8) showed that effect of two different types with two levels of prebiotics on carcass in broiler chicks during the experiment. There was no significant (P>0.05) difference among all treatments except dressing percentage and liver. While, the carcass weight of all dietary additive supplementations mathematically was improved if compared with control group, except the peppermint at 0.5% level in broiler chicks.
The present study are in agreement with researchers (El-Deek et al. 2002; Tekeli et al. 2006; Ocak et al. 2008; Moorthy et al. 2009; Ademola et al. 2009; Najafi and Torki 2010; Tekeli et al. 2011; Abdulkarimi et al. 2011; Sadeghi et al. 2011; Rahimi et al. 2011) who did not detect any improvement of carcass cuts and dressing percentage when they used ginger in broiler diet or drinking water. In disparity, the findings of this study are not consistent with those (Toghyani et al. 2010; Herawati and Marjuki 2011; Mansoub and Myandoab 2011).

Results of this study agree with results of study (El-Deek et al. 2002; Tekeli et al. 2006; Demir et al. 2008; Moorthy et al. 2009; Najafi and Torki 2010; Toghyani et al. 2010; Sadeghi et al. 2011; Rahimi et al. 2011) in where they did not find any significant differences in the relative weights of instinctual organs of broilers fed on diet or imbibed water containing ginger. In disparity, the results are dissimilar to those done by Tekeli et al. (2011), Mansoub and Myandoab (2011) who concluded that ginger dietary supplementations had significant effects on the instinctual organs of broiler chickens.

This study like our research shows that treatments, T1, T2, T3, T4 and T5, except male determined indicate non- significant differences in dressing percentage compared with the control group. This result agrees well with Durrani et al. (2007) who reported that the use of 40 ml of wild mint brew in drinking water had a significant (P<0.05) effect on mean dressing percentage, as compared with probiotic. Though, this result is not in agreement with Ocak et al. (2008) who reported that the carcass weight and dressing percentage were not significantly affected by peppermint. Mean weight of gizzard and heart showed no significant difference. Liver weight of control group was higher than those of the other groups. A former study carried out by the author using anise and rosemary led to similar results.

5.4. Blood Parameter

The result in Table (9) shows that the cholesterol and total protein concentration of broiler at the end of the experiment. There was significant (P>0.05) differences between all the additives supplementation and compared with control group, also, the PCV and HB, there was no significant (P>0.05) differences between all the treatments additives compared with control group.

The results are in agreement with the findings of researchers (Saeid et al. 2010; Toghyani et al. 2010; Toghyani et al. 2011; Mansoub and Myandoab 2011; Mohamed et al. 2012) who used ginger in the broiler`s diet or drinking water and did not find any effect on the serum blood proteins. Also using high dose of ginger powder in broilers diet had a negative and significant effect on the serum blood proteins according to (Al-Homidan 2005).

The positive effect of ginger and the moderate combination of herbs (ginger + thyme) on the serum blood proteins may be due to the effect of ginger which contains a high level of plant photolytic enzymes (Thompson et al. 1973; Ziauddin et al. 1995; Naveena et al. 2004) that could help birds to digestion dietary protein upon ingestion. Reduction of protein oxidation in the liver of rats fed on a diet containing ginger was also reported by (Kotaet al. 2008).

The positive effect of ginger and thyme on the concentration of cholesterol may be due to the effects of active compounds present in these two plants. The supplementation of ginger reduced cholesterol levels in blood serum because of its ant oxidative action which also a mechanism could be used as anti-stress approach (Jang et al. 2007). The hypo cholesterol emic action may be accomplished by ginger acting as a potential inhibitor of cholesterol synthesis (Saeid et al. 2010). Srinivasan and Sambaiah (1991) also reported that feeding rats with ginger significantly elevated the activity of hepatic cholesterol 7-alpha-hydroxylase which is a rate limiting enzyme in the biosynthesis of the bile acids and stimulates the conversion of cholesterol to bile acids leading to the reduction of cholesterol from the body. On the other hand, Lee et al. (2003) observed that the reduction of cholesterol by thyme in broiler chicks was attributed to the lowering effect of thymol or carvacrol on HMG-Co A reeducates (3hydroxy-3-methyl-glutaryl-CoA reductase) the rate limiting enzyme of cholesterol synthesis.

While the results are in agreement with the findings of researchers (Al-Homidan 2005; Tekeli et al. 2006; Najafi and Torki 2010; Toghyani et al. 2010; Mansoub and Myandoab 2011; Rahimi et al. 2011) who did not detect any difference in the cholesterol attention of broilers fed on dietary supplementation with ginger compared to the control group.
The positive effect of ginger and peppermint on the concentration of cholesterol may be due to the effects of active compounds present in these two plants. The supplementation of ginger reduced cholesterol levels in blood serum because of its anti- oxidative action which also a mechanism could be used as anti-stress method (Jang et al. 2007). The hypo cholesterol emic action may be talented by ginger acting as a latent inhibitor of cholesterol synthesis (Saeid et al. 2010). Srinivasan and Sambaiah (1991) also reported that feeding pests with ginger significantly elevated the activity of hepatic cholesterol 7-alpha-hydroxylase which is a rate limiting enzyme in the biosynthesis of the bile acids and stimulates the conversion of cholesterol to bile acids foremost to the decrease of cholesterol from the body.

Like our study the results show a significant increase ($p<0.01$) in total of hemoglobin (HB), packed cell volume (PCV), total protein concentration and high in blood serum. May return to contain peppermint powder high amounts of iron 5.08 mg/ 100gm (USDA 2012), which enters in the structure of blood hemoglobin and then in thus an increase in the size of blood cells volume (PCV), also peppermint contain B complex vitamins, contributed in manufacturing erythrocytes processes in bone marrow (Sturike 1986). The reason for the high volume of blood cells related to contain peppermint powder on vitamin A and E, which has an important role in preventing the disintegration red blood cells (Erythrolysis) through their work and defense plasma membranes from the damage of anti-oxidant that happens of oxidation stress (Coles 1986), The high level of fibers in peppermint 21.2/100gm can increase the emission of bile and this can decrease the cholesterol level of blood (Al-Kassie 2009).

6. CONCLUSION

1. Prebiotic can stimulate the growth of the digestive system as well as may effect on the growth performance.

2. The herbs powder at level of 0.5% peppermint and 0.5% ginger in the feed was the best supplementation for the broiler.

3. Diet supplementation with ginger powder (0.5 and 1%) did not have any improvement on the broiler`s performance especially productive traits.

4. No significant differences were observed between both types of prebiotic treatments and compared with control group for live body weight except in first, second and third weeks.

5. There is no significant difference for carcass characterization except dressing percentage and liver at final experiment.

6. These medicinal plants generally improved biochemical parameters of the broiler chicks.

7. Effect of two typical dietary on blood parameters was significant in cholesterol and total protein except PCV and HB.

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