



The effect of using an imported Phytogetic Plant Additive and Comparing it with a mixture of Oil (black seed, thyme and anise) in Some immune properties of the Meat scalp*

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- Date of research received 08/05/2023 and accepted 07/06/202.
- Part of Ph.D. Dissertation for the first author.

Abstract

This study was conducted in the poultry field of the Department of Animal Production / College of Agriculture / University of Basrah during the period from 5/20/2021 to 6/23/2021 to find out the effect of adding imported phytogetic to feed and water for broiler chickens according to the completely randomized design (CRD), for differences between transactions and to compare it with a mixture of local oil and for different periods of time. on some immune traits of broiler chickens. 324 one-day-old broiler chicks were randomly distributed to 9 treatments:

T1 without adding, T2 adding 150 mg PFA / kg of feed from the period (1-5) weeks of the age of the experiment, T3 adding 3 ml liquid PFA / liter of drinking water from the period (1-5) weeks, T4 adding 3 ml Local oil mixture / kg of feed from (1-3) weeks, T5 adding 3 ml of local oil mixture / kg of feed from (3-5) weeks, T6 adding 3 ml of local oil mixture / kg of feed from (1-5) weeks, T7 add 3 ml of local oil mixture/ liter of drinking water from (1-3) weeks, T8 add 3 ml of local oil mixture / liter of drinking water from (3-5) weeks, T9 add 3 ml of local oil mixture / liter of drinking water from (1-5) weeks. The results showed a significant superiority of all the experimental treatments in feed and water over the control treatment T1 (without addition) in the immunological characteristics studied in the experiment, which is the balance of intestinal flora in the jejunum of the small intestine (total bacteria, and increase in lactic acid bacteria, a decrease in pathological coliform bacteria). Coli, and the results showed a significant superiority of all experimental treatments in the volumetric measure of antibodies against Newcastle disease and Camboro disease at the age of 35 days compared to the control treatment T1 (without addition).

Key words: Immunity, Digestive enzymes, Antibodies, Plant extract, Local oil.

Citation: Jader, M., & Jassim, J. (2023). The effect of using an imported Phytogetic Plant Additive and Comparing it with a mixture of Oil (black seed, thyme and anise) in Some immune properties of the Meat scalp. *Kirkuk University Journal For Agricultural Sciences*, (), 251-257. doi: 10.58928/ku23.14223

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Introduction

Recently, the plant additive PFA, which consists of a group of aromatic plant herbs, spices, citrus fruits and their oils, has been widely used because these plants possess effective and active substances to stimulate the bird's body to grow, increase production, and resist diseases by increasing the body's immunity to it, and thus reducing the percentage of deaths and improving the health status of birds.[1], [2], as well as the use of medicinal plants and their extracts to stimulate appetite and increase the immune aspect of the bird [3]. Additives to plant feeds are also considered important sources when added to diets and drinking water for birds, because they contain fat-soluble vitamins (A, D, E, and K). They also contribute to the absorption of lipoproteins and their digestion [4], [5]. Medicinal herbs, spices and aromatic plants contain biologically active substances that stimulate the production of digestive enzymes due to the fact that they contain many effective compounds such as (anethole, eonol, thymol, car-vacrol, etc.) [6], [7]. Aromatic plants and their oils consist of a large number of chemical compounds. Therefore, studies indicate that their ability cannot be attributed to a single mechanism of action, but rather many different mechanisms of action for these phenolic compounds, which are mainly responsible for giving these plants their important property as natural antibiotics. It has side effects on animals or humans who consume their meat and produce it [8], [9].

Materials and methods

This study was conducted in the field of poultry in the Department of Animal Production / College of Agriculture / University of Basrah. The chicks were raised in homemade metal batteries consisting of

three floors, with dimensions of 1 x 1.5 m, and a height of 70 cm from the floor. 324 medium meat chicks, weighing 40 g, unsexed, one day old, of (Ross 308) strain, were distributed randomly in cages with 9 treatments, each treatment had three Replicates for each replicate [10] birds according to the complete random design (CRD). The birds were fed two diets, the first starting from (1-3) weeks and containing 23.10% crude protein and 3010 kilocalories/energy represented, and the second a growth diet from 21 days to 35 years old. Day A day that contained 20.14% crude protein and 3174 kilocalories/representative energy. Nutrition and water were provided freely. All measures were taken to maintain ideal conditions of heat, humidity and ventilation throughout the study period. Health preventive measures were also taken. The study parameters were as follows:

T1: Control without any addition.

T2: Add 150 mg dry PFA / kg feed from (1-5) weeks.

T3: Add 3 ml liquid PFA / liter of drinking water from (1-5) weeks.

T4: Add 3 ml of local oil mix / kg feed from (1-3) weeks.

T5: Add 3 ml of local oil mix / kg feed from (3-5) weeks.

T6: Add 3 ml of local oil mix / kg feed from (1-5) weeks.

T7: Add 3 ml of the local oil mix / liter of drinking water from (1-3) weeks.

T8: Add 3 ml of the local oil mix / liter of drinking water from (3-5) weeks.

T9: Add 3 ml of the local oil mix / liter of drinking water from (1-5) weeks

Table No. (1) Percentages of feed materials included in the composition of the starter and growth diets for broiler chickens, and the chemical analysis calculated according to the chemical analysis of the feed materials based on the nutritional analysis tables.

Feed Ingredients:	Buddy's diet 1-21 days	Growing feed 22-35 days
Corn	42.75	41.75
Wheat	15.0	22.0
Soybean meal 44%	34.5	27.0
Protein Concentrate	5.0	5.0
Vegetable oil	0.8	2.3
Premix (a mixture of vitamins and minerals)	0.2	0.2
Limestone	1.5	1.5
Salt	0.25	0.25
Total	100	100
Metabolism energy kg/kcal	3010	3174
Crude protein %	23.10	20.14
Energy: Protein	130.30	157.6
Calcium (%)	0.925	0.988
Available phosphorous %	0.42	0.51
Lysine %	1.35	1.17
Methionine %	0.52	0.49
Methionine % + cysteine %	0.886	0.826
Tryptophan	0.295	0.261

Results and discussion

The results of the statistical analysis (Table 2) indicated the effect of adding PFA and the oil mixture (*Nigella sativa*, anise, thyme) on the average balance of intestinal flora in the jejunum area of broiler chickens at the age of 35 days (mean \pm standard error) to the presence of slight arithmetic differences between the treatments of the experiment on Level ($P \leq 0.5$), where all treatments were similar in results with the treatment of T2 and T3, which are the two treatments of imported PFA 8.870 and 8.850, respectively. As the best treatment for the local oil mixture was T6, T9 (8.820, 8.800), which is the addition from (1-5) weeks in feed and water with respect to total bacteria. Also, the percentage of lactic acid bacteria increased for all addition treatments in the experiment compared to the control treatment T1, which recorded the lowest

percentage of 4.354, while the best treatment was T2, T3, T6, T9 6.530, 6.520, 6.400, 6.340 respectively. All addition treatments reached similar results, offset by a decrease in the addition-free control treatment. As for the pathological bacteria in the colon (*E. Coli*), it decreased in all addition treatments in the experiment compared to the control treatment, which recorded the highest result, T1 (52.24), and was the lowest result. In the coefficients of addition to the local oil mixture for feed T6 from (1-5) weeks, it was 23.02, while the addition to the local oil mixture in water was T9, 23.12, and the reason may be due to the presence of active and biologically active substances in both additives PFA and the local oil mixture [11], [12], the decrease in the level of total bacteria, the increase in the percentage of beneficial bacteria, and the decrease in the percentage of pathological

bacteria is the basic and effective action of the vegetable additives. PFA, as well as those found in the local oil mixture (*Nigella sativa*, anise, thyme), where the active substances in these plants act in an allosteric manner, and the most important of these active substances are (carava krol, eugenone, thymol, capsaicin, cineole) and other substances known as antibacterial, antifungal, antivirals, anticoccidiosis [12], [13], [14]. The reason could be the antimicrobial action present in PFA and the oil mixture as a result of the hydrophobicity of these phenolic compounds, or because these active substances were able to enter the bacterial cell membrane, which leads to the dissolution of the cell membrane, the leakage of ions from it, and the death of cells at the end [15].

Medicinal plants and their essential oils have antimicrobial properties because they contain many active substances (thymol,

egonol) and others. These substances can penetrate the Gram-positive bacterial cell membrane and have antioxidant effects, which increase the body's immunity and health [16]. These compounds have Phenolic properties and their availability in PFA and oil blends (black seed, anise, thyme) It mainly gave the important characteristic of these additives, which is that they are natural antibiotics, as the black seed has a great stimulating effect against bacteria of the genera (*Staphylococcus*, *Vibro*) and for several types of fungi, because it contains nigillone and allicin. Anise also plays an important role in strengthening the immune system due to its antibacterial effect [17]. And thyme because it contains (thymol, carvacrol), which improves liver function by stimulating the production of digestive enzymes and antimicrobials that inhabit the intestine [18], [19], [11], [4].

Table (2) Effect of vegetable additive PFA and herbal on the average balance of intestinal flora

Treatments	Total bacterial count Log Cut/g	The number of lactic acid bacteria %	coli bacteria count %
T1	8.883 ± 0.34 a	4.354 ± 1.14 c	52.24 ± 1.55 a
T2	8.870 ± 0.60 a	6.530 ± 2.03 a	22.32 ± 1.02 c
T3	8.850 ± 0.30 a	6.520 ± 1.10 a	22.30 ± 1.32 c
T4	7.880 ± 0.40 b	5.390 ± 1.12 b	25.42 ± 1.07 b
T5	7.790 ± 0.50 d	5.410 ± 2.23 b	25.29 ± 1.02 b
T6	8.820 ± 0.60 a	6.400 ± 2.09 a	23.02 ± 1.09 c
T7	7.790 ± 0.60 d	5.310 ± 2.10 b	25.02 ± 2.11 b
T8	7.810 ± 0.70 c	5.290 ± 2.01 b	24.12 ± 2.09 b
T9	8.800 ± 0.70 a	6.340 ± 2.41 a	23.12 ± 1.01 c
Significant	*	*	*

In the jejunum area of broiler at the age of 35 days (mean ± standard error).

* Indicates that there are significant differences between the treatments at the level ($P \leq 0.05$).

Volumetric standard of antibodies Newcastle disease and Camboro

In Table No. (3) the effect of adding the imported PFA vegetable additive and the local oil mixture in feed and water on the volumetric standard of antibodies against Newcastle disease and Camboro disease (mean ± standard error) in the serum of broiler chickens at the age of 35 days. The

results showed that all addition treatments occurred. It had a significant superiority ($P \leq 0.05$) compared to the control treatment (T1 without addition). The best treatment was T2 addition, adding PFA to the feed from (1-5) weeks, as it recorded 6137.36), followed by T6 6122.20 (Adding the local oil mixture to the feed from 1-5 weeks) as it recorded 6122.20, with regard to the antibodies against Newcastle disease, but against

Camboro disease, all addition treatments gave better results and a significant superiority ($P \leq 0.05$) compared to the control treatment T1 (without addition) and it was better Results T2 (adding PFA to the feed from 1-5 weeks was (4641.70), followed by T6 4590.66 (adding the local oil mixture from 1-5 weeks) to the feed and recording 4590, then T9 adding the oil-in-water mixture from (1-5) weeks 4530.53 against Camboro disease. The reason may be due to the presence of active and biologically active substances in both PFA additives and the local oil mixture [11], [19]. As these

substances act in a synergistic manner in the elimination of pathogens and toxins, and thus positively affect the health and interaction of the animal and increase the immunity in its body against diseases [1].

Also, the reason for the increase in the number of antibodies against Newcastle and Camboro disease is due to the incorporation of plant extracts, which contain polyphenols, which have the ability to clear free radicals and maintain the integrity of the immune structure of immune cells [18] , [19] , [20] ,[21] .

Table (3) Effect of vegetable additive PFA and the local oil mixture on the volumetric standard of antibodies against Newcastle disease and Camboro disease in broiler chickens at the age of 35 days (mean \pm standard error)

Treatments	against Newcastle disease	Against Compro disease
T1	3251.43 \pm 80.31 c	2140.90 \pm 120.03 f
T2	6137.36 \pm 90.13 c	4641.70 \pm 135.02 a
T3	6080.73 \pm 91.50 a	4422.70 \pm 136.44 a
T4	5430.20 \pm 93.40 b	4113.76 \pm 140.14 c
T5	5431.53 \pm 100.01 b	4221.70 \pm 150.11 b
T6	6122.20 \pm 122.03 c	4590.66 \pm 155.12 a
T7	5683.63 \pm 145.01 b	4115.56 \pm 162.13 c
T8	5522.26 \pm 149.11 b	4122. 66 \pm 1660.14 c
T9	6010.56 \pm 140.11 a	4530.53 \pm 170.11 a
Significant	*	*

* Indicates that there are significant differences between the treatments at the level ($P \leq 0.05$).

* Indicates that there are significant differences between the treatments at the level ($P \leq 0.05$).

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تأثير استخدام المضاف النباتي Phytogetic المستورد (PFA) ومقارنته مع الزيت المحلي في بعض الصفات المناعية لفروج اللحم*

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• البحث مستل من اطروحة دكتوراه للباحث الاول.

الخلاصة

أجريت هذه الدراسة في حقل الدواجن التابع لقسم الإنتاج الحيواني / كلية الزراعة / جامعة البصرة خلال الفترة من 2021/5/20 ولغاية 2021/6/23 لمعرفة تأثير إضافة الـ Phutogenic المستورد الى العلف والماء لفروج اللحم ومقارنته مع مزيج من الزيت المحلي وبفترات زمنية مختلفة على بعض الصفات المناعية باستعمال التصميم العشوائي الكامل (CRD) تم توزيع 324 فرخ لحم بعمر يوم واحد عشوائيا على 9 معاملات:-

T1 بدون اضافته، T2 اضافته 150 ملغم PFA / كغم علف من الفترة (1-5) أسبوع من عمر التجربة والبالغة 5 أسابيع، T3 إضافة 3 مل PFA سائل / لتر ماء شرب من الفترة (1-5) أسبوع، T4 اضافته 3 مل مزيج الزيت المحلي / كغم علف من (1-3) أسبوع، T5 اضافته 3 مل مزيج الزيت المحلي / كغم علف من (3-5) أسبوع، T4 اضافته 3 مل مزيج الزيت المحلي / كغم علف من (1-3) أسبوع، T5 اضافته 3 مل مزيج الزيت المحلي / كغم علف من (3-5) أسبوع، T6 اضافته 3 مل مزيج الزيت المحلي / كغم علف من (1-5) أسبوع، T7 إضافة 3 مل مزيج الزيت المحلي / لتر ماء الشرب من (1-3) أسبوع، T8 إضافة 3 مل مزيج الزيت المحلي / لتر ماء الشرب من (3-5) أسبوع، T9 إضافة 3 مل مزيج الزيت المحلي / لتر ماء الشرب من (1-5) أسبوع، وقد أظهرت النتائج تفوقاً معنوياً لجميع معاملات التجربة في العلف والماء على معاملة السيطرة T1 (بدون إضافة) في الصفات المناعية المدروسة في التجربة وهي توازن الفلورا المعوية في منطقة الصائم من الأمعاء الدقيقة (البكتريا الكلية، ارتفاع بكتريا حامض اللكتيك، انخفاض في البكتريا المرضية القولونية E.Coli) وقد أظهرت النتائج تفوقاً معنوياً لجميع معاملات التجربة في المقياس الحجمي للأضداد ضد مرض النيوكاسل ومرض الكمبورو عند عمر 35 يوم مقارنة بمعاملة السيطرة T1 (بدون إضافة).

الكلمات المفتاحية: مناعة، الانزيمات الهاضمة، الاجسام المضادة، مستخلصات نباتية، زيت محلي.