



EFFECT OF THE USE OF IMMERSION AND INJECTION METHODS FOR EGGS HATCHING OF BROILER BREEDERS IN THE AQUATIC EXTRACTS OF SOME PLANT SEEDS AS EARLY FEEDING : 2-SUBSEQUENT PRODUCTION PERFORMANCE

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Abstract

This study was conducted with the aim to find out the effect of immersion and injection methods of hatching eggs in the aquatic extracts of some plant seeds on subsequent production performance, 1050 eggs were used for hatching and were randomly divided into seven treatments with three replicates (50 eggs / replicate) and the immersion process was applied before the eggs were held for 1 minute, while they were injected on the 17th day of the incubation with the amniotic fluid in a quantity of 0.2 ml and carried out for 5/4/2019 Until 27/4/2019, Treatments of experiment were:- Treatment 1th, Control group (Cont.), and treatments 2th, (T_{DF}) (Dipping fenugreek) 3th, (T_{IF}) (Injection fenugreek) Included immersion and injection of hatching eggs with the aquatic extract of the fenugreek seeds, treatments 4th, (T_D) (Dipping oat(5th,) T_I) (Injection oat (Included immersion and injection of hatching eggs with the aquatic extract of the oats seeds, treatments 6th (T_{DB}) (Dipping basil) 7th (T_{IB}) (Injection basil) Included immersion and injection of hatching eggs with the aquatic extract of the basil seeds, the concentration of all extracts was 6% of treatments', respectively. Breeding was hatched chicks in the poultry field in Abu Ghraib - Faculty of Engineering Sciences Agricultural - University of Baghdad for the period 27/04/2019 until 05/11/2019 with aim to study the effect of immersion and injection of hatching eggs extracts above in the subsequent productive performance. Results revealed that supplementation of immersion by fenugreek and basil seeds have improved significantly from the rates of the body weight, weight gain, FCR and production index. Furthermore, there were no significant interactions between treatments of the rate of weekly feed consumption, dressing percentage with and without edible offal. On the other hand, the treatment of immersion aqueous extract oats showed a significant decrease (P<0.01) of relative weight for breast and a significant increase in the relative weight of the thigh compared to control. In conclusion the use of immersion method of hatching eggs in the aqueous extract of fenugreek and basil seeds could be improved subsequent production performance for chicks hatched.

Key words : Fenugreek, oats, basil, broiler.

Introduction

The poultry industry has recently seen, in particular, broiler breeding increase in production at a faster rate than any other farm animal worldwide. Among the reasons for this success is the use of a balanced nutrition program in poultry diets (Yadav and Jha, 2019), in addition to the selection and genetic improvement programs that achieved a significant improvement in the qualitative and productive characteristics of broilers, which reflected positively in productive performance, and with this

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increase in performance, embryo requirements for nutrients have changed, while the chemical composition of the egg remained without tangible changes, so thus, the authors have directed to promote and provide additional nutrients to the fetuses through *In ovo* Injection Technology. Increase was achieved in the hatching percentage when injecting sugars such as fructose, sucrose and grape seed extract and increased significantly of body weight for chicks hatched at the injection of amino acids with glucose and magnesium, in addition, amino acids and carbohydrates contributed when injected into the egg to increase the activity of digestive

enzymes and maturation of the intestine with Early stimulation of the development of the intestine in broiler (Kucharska-Gaca *et al.*, 2017). The researchers also used to inject hatching eggs with carbohydrates (Maltose, Sucrose, Dextrose) as an energy source that enabled them to improve the development of Goblet cells, increase the surface area of villi, and increase body weight when hatching (Uni *et al.*, 2005; Smirnov *et al.*, 2006; Foye *et al.*, 2006). While some of them tended to use extracts of some plants as nutrients to be injected into hatching eggs in order to develop embryos and increase their growth and maturity integration, including Pruszyńska-Oszmalek *et al.*, (2015) as it was concluded that the injection of hatching eggs, prebiotics produced by wheat into the amniotic fluid, and at the age of 17 days from incubation, increased the biological availability of iron and intestinal microflora. Zarei *et al.*, (2016) arrived when injecting the *Silybum marianum* plant extract into the egg at a level of 0, 100 and 200 mg / liter on day 17.5 of incubation as early feeding and its effect on the immune response under the influence of heat stress led to an increase in body weight at day 28 and 42 and increased significant relative weights of the Thymus gland and spleen and antibodies against camburo disease increased through the use of plant extract. Sobolewska *et al.*, (2017a) found that injections with seaweed extract *Laminaria* species into the air chamber at the age of 12 days have significantly improved the development of the duodenum. Aljumaily and Taha (2019) concluded that the injection of *Spirulina platensis* algae in hatching eggs of Japanese quail at a concentration of 1, 2% and at a dose of 50 μ L at the site of the air chamber, specifically on the 14th day of embryo development, led to an increase in the hatching rate for injection treatments (79.91,82.11%) Compared to the control treatment (77.34%) as for the productive characteristics, the extract affected a concentration of 2% significantly in the weight increase and feed consumption during the total breeding period compared to the rest of the transactions. In view of the absence of any studies, whether locally or globally, in the effect of using aquatic extracts for seeds containing in their composition on the gums, we set out to design this study to show the effect of the extracts of fenugreek, oat and basil seeds as early feeding in both injection and immersion methods in the productive performance of the incubated chicks and determine the best extract and method.

Materials and Methods

The study included immersion of eggs in the aqueous extracts of fenugreek seeds and oats basil before it was introduced to incubation machines for some treatments. As for the other treatments, the eggs were injected with

the same aqueous extracts of the seeds above on day 17 of the incubation. a total of 1050 eggs hatching of broiler breeders (Ross-308) from one field of 34-week-old, The eggs were hatched in the hatchery of Al-Anwar Poultry Company (Al-Mouradia District – Babylon Governorate) for the period from 5/4/2019 until 27/4/2019. The hatching chicks were reared in the poultry fields of the College of Agricultural Engineering Sciences in Abu Ghraib District for the period 27/4/2019 until 31/5/2019 with the aim of studying the effect of immersion and injection of hatching eggs with the above extracts on the subsequent performance of broilers. The concentration of all extracts was 6% for the treatments, respectively, use perforated plastic baskets, laying eggs for each treatment in it very carefully in order to avoid cracking in the shell, Then submerge it in a larger plastic container in which the prepared liquid, which has a temperature of 25 ° C., was placed and the time of preparing the extract was 3 minutes. As for injection; At the end of the seventeenth day of laying eggs in incubators and was carried out in the area of the amniotic fluid after the process of scanning the eggs and at an angle of 45° deviation from the linear axis in the wide part of the egg, following the method shown from Zhu *et al.*, (2019) with a depth of 25 mm and a dose of 0.2 ml, close the eggshell hole with the dye. The hatched chicks were distributed for each treatment by 3 replicates per treatment, the birds were reared on floor pens, each pen one hanging tube feeder and one suspended drinker. Feed and water were offered *ad libitum* and the light program was 24 L. Birds housed on floor pens and used sawdust as litter. During the experiment at two – phase feeding program consisted of a starter (1-21 days of age, 22.3% P., 3000Kcl E.) and finisher (22-42 days of age, 21.4% P., 3100Kcl E.) was provided to broilers. Weights of birds were recorded and the weekly and total weight gain was calculated, the amount of feed consumed and the food conversion factor (FCR), in addition to the calculation of the production index (PI). Data were analyzed statistically by ANOVA using a completely randomized design (CRD). In case of significance difference, multiple range test was used (Duncan, 1955). Statistical software SAS, 2012 was used to carry out statistical analysis.

Results and Discussion

According to the results of Table 1, the effect of immersion and injection of hatching eggs with aqueous extracts of fenugreek, oat and basil seeds on the weekly average body weight until a significant decrease ($P < 0.01$) In body weight for the first and second weeks of breeding for basil injection treatment (T_{IB}) compared to control treatment, As their average values were 177.9 and 195.7

g. However, all immersion and other injection treatments did not differ significantly between them and the control treatment in the same characteristic for the first and second weeks, respectively, and the effect of immersion started to appear for the third week, Significant increase ($P < 0.01$) in immersion in the fenugreek and basil extract treatments was significantly increased compared to the control treatment. Also, the treatment of basil injection (T_{IB}) resulted in a significant decrease in comparison with the control treatment. There were no significant differences between the treatment of injection by fenugreek and oat extract (T_{IF} and T_{IO}) and immersion of oat extract (T_{DO}) compared to the control treatment for the third week of breeding, the overall average for this week was 977.1, 1037.2, 1005.3, 1000.9, 992.4, 1015.5 and 919.5 g for T_C , T_{DF} , T_{IF} , T_{DO} , T_{IO} , T_{DB} and T_{IB} treatments, respectively. While the results of the control treatment converged and all the treatments of immersion and injection with water extracts of fenugreek, oat and basil seeds, and there were no significant differences between the mentioned treatments for the fourth week of breeding. Significant improvement was showed ($P < 0.05$) for fenugreek and basil extract immersion (T_{DF} and T_{DB}) and fenugreek and oat extract injection compared to basil injection (T_{IB}). The results in the same table indicated that the application of immersion with the aqueous extract of fenugreek and basil seeds the best mean in BW for the fifth week had a significant increase ($P < 0.01$) compared to the control treatment. As its values reached 2184.2, 2137.3 and 2030.2 g, and no significant

Table 1: Effect of immersion and injection of hatching eggs with aqueous extracts of fenugreek, oat and basil seeds on weekly body weight (g /bird) for broilers.

Treatments	Age at breeding (days)				
	1-7	8-14	15-21	22-28	29-35
T_C	195.7 ^a	505.8 ^a	977.1 ^c	1428.4 ^{ab}	2030.2 ^b
T_{DF}	204.7 ^a	519.8 ^a	1037.2 ^a	1501.5 ^a	2184.2 ^a
T_{IF}	198.5 ^a	504.4 ^a	1005.3 ^{abc}	1482.5 ^a	2093.6 ^{ab}
T_{DO}	197.1 ^a	505.7 ^a	1000.9 ^{bc}	1461.3 ^{ab}	2019.8 ^b
T_{IO}	193.6 ^a	499.1 ^a	992.4 ^{bc}	1490.4 ^a	2088.2 ^{ab}
T_{DB}	203.7 ^a	513.2 ^a	1015.5 ^{ab}	1498.5 ^a	2137.3 ^a
T_{IB}	177.9 ^b	451.4 ^b	919.5 ^d	1383.8 ^b	1881.7 ^c
SEM	3.69	6.37	9.95	24.38	28.72
P-value	0.0109	0.0002	0.0001	0.0870	0.0002

Experimental treatments: T_C : control treatment, T_{DF} , T_{IF} : treatment of immersion and injection of hatching eggs with aqueous extract of fenugreek seeds, T_{DO} , T_{IO} : treatment of immersion and injection of hatching eggs with aqueous extract of oats, T_{DB} , T_{IB} : treatment of immersion and injection of hatching eggs with aqueous extract of basil seeds. ^{a,b,c}Means in the same column bearing different superscripts differ significantly ($P < 0.05$) or (0.01) . SEM = Standard error of means.

differences were found between control treatments, immersion and injection of oat aqueous extracts (T_{DO} and T_{IO}) and fenugreek extract injection (T_{IF}), while the treatment of aqueous extract of basil seeds (T_{IB}) formed the lowest average values (1881.7 g) between the treatments and decreased significantly compared to the control treatment and all immersion and injection treatments.

It is noted from the results in (Table 2). There was a significant decrease ($P < 0.05$) in the treatment of basil injection (T_{IB}), which recorded the lowest mean between values (136.2 g) compared to control (152.9 g) and all immersion treatments (T_{DF} , T_{DO} and T_{DB}) (159.4, 152.8, 156.4g), fenugreek extract injection (T_{DF}) (154.9g). We did not find any significant differences between the treatment of basil extract injection (TIB) and oat extract injection (T_{IO}) in the weight gain characteristic for the first week. Also, it was noted from the results mentioned in the same table above a significant decrease ($P < 0.05$) for the treatment of basil extract injection (T_{IB}) compared to the control treatment, immersion and other injection treatments for the second week, the immersion treatments in the aqueous extract of fenugreek and basil seeds (T_{DF} and T_{DB}) were the highest between values and significantly increased ($P < 0.01$) compared to the control and basil extract (T_{IB}) treatments, while there were no significant differences in the overall rate of control treatment and treatment of oat extract immersion (T_{DO}) and all injections treatment in the weight gain for the third week. As for the same quality in the fourth week, there were no significant differences between treatment control, immersion treatments and injection with water extracts. It is also evident from the same table above that there were no significant differences between control treatment and immersion and injection treatments of aqueous extract of fenugreek, oat and basil seeds (T_{DF} , T_{DO} and T_{DB}). However, the treatment of immersion with fenugreek extract (T_{DF}) recorded a significant increase ($P < 0.05$) compared to the treatment of basil infusion injection (T_{IB}) in the rate of weight gain for the fifth week of breeding. The general mean of the immersion treatment with fenugreek seed water aqueous extraction (T_{DF}) was the highest among the treatments in the cumulative weight gain characteristic, with a general average of 2138.8 g and a significant increase ($P < 0.01$) compared to the control treatment of 1990.0 g. On the other hand, no significant differences were observed between treatment control and immersion treatment with oat and basil water extract (T_{DO} and T_{DB}) and fenugreek and oat extract (T_{IF} and T_{IO}), while the basil extract injection treatment (T_{IB}) decreased significantly and the

Table 2: Effect of immersion and injection of hatching eggs with aqueous extracts of fenugreek, oat and basil seeds. Weekly and cumulative weight gain rate (g /bird) of broilers.

Treatments	Age at breeding (days)					
	1-7	8-14	15-21	22-28	29-35	1-35
T _C	152.9 ^a	310.1 ^a	471.2 ^{bc}	451.2	601.8 ^{ab}	1990.0 ^{bc}
T _{DF}	159.4 ^a	315.0 ^a	517.4 ^a	464.4	682.5 ^a	2138.8 ^a
T _{IF}	154.9 ^a	305.8 ^a	497.4 ^{ab}	477.1	611.1 ^{ab}	2047.8 ^{abc}
T _{DO}	152.8 ^a	308.5 ^a	495.2 ^{abc}	460.4	558.5 ^{ab}	1975.5 ^c
T _{IO}	148.9 ^{ab}	305.4 ^a	493.3 ^{abc}	498.0	597.7 ^{ab}	2043.5 ^{abc}
T _{DB}	156.4 ^a	309.4 ^a	502.3 ^a	482.9	638.8 ^{ab}	2090.0 ^{ab}
T _{IB}	136.2 ^b	273.5 ^b	468.0 ^c	464.3	497.8 ^b	1839.9 ^d
SEM	3.72	7.34	8.50	25.22	37.38	29.26
P-value	0.0356	0.0339	0.0170	0.9201	0.1852	0.0003

Experimental treatments: T_C: control treatment, T_{DF}, T_{IF}: treatment of immersion and injection of hatching eggs with aqueous extract of fenugreek seeds, T_{DO}, T_{IO}: treatment of immersion and injection of hatching eggs with aqueous extract of oats, T_{DB}, T_{IB}: treatment of immersion and injection of hatching eggs with aqueous extract of basil seeds. ^{a,b,c}Means in the same column bearing different superscripts differ significantly (P < 0.05) or (0.01). SEM = Standard error of means.

Table 3: Effect of immersion and injection of hatching eggs with aqueous extracts of fenugreek, oat and basil seeds on the weekly and total feed consumption (g /bird) of broilers.

Treatments	Age at breeding (days)					
	1-7	8-14	15-21	22-28	29-35	1-35
T _C	156.9 ^{ab}	415.5 ^a	665.6	780.7	989.7 ^b	3008.5
T _{DF}	167.8 ^a	408.7 ^a	689.8	728.5	974.7 ^b	2969.6
T _{IF}	158.1 ^{ab}	408.4 ^a	661.1	761.4	964.7 ^b	2962.8
T _{DO}	154.3 ^{ab}	400.2 ^{ab}	648.9	775.8	1006.3 ^b	2985.6
T _{IO}	149.2 ^{ab}	412.9 ^a	659.2	801.8	988.2 ^b	3011.6
T _{DB}	159.0 ^{ab}	401.8 ^{ab}	649.6	756.0	1006.2 ^b	2972.6
T _{IB}	146.3 ^b	373.4 ^b	653.9	760.7	1092.9 ^a	3027.4
SEM	5.55	8.52	12.67	27.93	22.38	35.43
P-value	0.2951	0.1378	0.4621	0.8000	0.0668	0.8813

Experimental treatments: T_C: control treatment, T_{DF}, T_{IF}: treatment of immersion and injection of hatching eggs with aqueous extract of fenugreek seeds, T_{DO}, T_{IO}: treatment of immersion and injection of hatching eggs with aqueous extract of oats, T_{DB}, T_{IB}: treatment of immersion and injection of hatching eggs with aqueous extract of basil seeds. ^{a,b,c}Means in the same column bearing different superscripts differ significantly (P < 0.05) or (0.01). SEM = Standard error of means.

lowest values between treatments compared to control treatment and Immersion and other injection treatments.

The results shown in table 3, there are no significant differences between treatment control and immersion treatments and injection with water extracts of fenugreek, oat and basil seeds in the feed consumption characteristic for the first week of breeding. Whereas, a significant decrease (P < 0.05) was shown for the treatment of basil water extract (T_{IB}) when compared to fenugreek immersion treatment (T_{DF}) for the same week. The effect of basil aqueous extract (T_{IB}) was continued by registering the lowest values between the treatments as an extension

of the second week of breeding, the lower feed consumption was compared to the control parameters, Immersion and injection of fenugreek extract (T_{DF} and T_{IF}) and oat injection (T_{IO}), While the significant effect of using immersion and injection in feed consumption for the third and fourth weeks of breeding respectively has disappeared, as well as the characteristic of total feed consumption when compared with the control treatment. While the treatment of basil injection (T_{IB}) had a significant increase (P < 0.05) when compared with the control treatment and other immersion and injection treatments in the last week of breeding (the fifth week), The average of this quality was 989.7, 974.7, 964.7, 1006.3, 988.2, 1006.2 and 1092.9 g for T_C, T_{DF}, T_{IF}, T_{DO}, T_{IO}, T_{DB} and T_{IB} respectively for the fifth week.

From the observation of the means in Table 4, for the effect of immersion and injection of hatching eggs with aqueous extracts of fenugreek, oat and basil seeds in the weekly in FCR, the absence of significant differences between control treatment and application of the immersion and injection processes with aqueous extracts of fenugreek, oat and basil seeds is observed for the first and second weeks of breeding, the absence of this effect continued for the third and fourth weeks, respectively, except for a significant improvement (P < 0.05) for the oat and basil immersion treatments (T_{DO} and T_{DB}) when compared with the control treatment for the third week. As for the fifth week of breeding, the negative effect started to appear when applying the method of injecting the aqueous extract of basil seeds (T_{IB}), the basil injection treatment recorded the highest values among the experimental treatments for the fifth week, and the overall average for this treatment

was 2.19. Observing the general means of the total FCR, the method of immersion in the aqueous extract of fenugreek and basil seeds (T_{DF} and T_{DB}) achieved a significant improvement (P < 0.01) in this characteristic compared to the control treatment and other immersion and injection treatments. Whereas, the worst FCR was in the basil injection (IB) treatment compared to the control treatment and other immersion and injection treatments. The overall means were 1.51, 1.38, 1.44, 1.50, 1.47, 1.41, and 1.64 for the treatments T_C, T_{DF}, T_{IF}, T_{DO}, T_{IO}, T_{DB} and T_{IB} respectively.

Table 5, shows the effect of immersion and injection

Table 4: Effect of immersion and injection of hatching eggs with aqueous extracts of fenugreek, oat and basil seeds in the weekly and total FCR (feed g/ weight gain g) for broiler.

Treatments	Age at breeding (days)					
	1-7	8-14	15-21	22-28	29-35	1-35
T _C	1.02	1.34	1.41 ^a	1.73	1.64 ^b	1.51 ^b
T _{DF}	1.05	1.29	1.33 ^{ab}	1.58	1.45 ^b	1.38 ^c
T _{IF}	1.01	1.33	1.34 ^{ab}	1.59	1.58 ^b	1.44 ^{bc}
T _{DO}	1.00	1.29	1.30 ^b	1.67	1.77 ^b	1.50 ^b
T _{IO}	1.00	1.34	1.33 ^{ab}	1.62	1.67 ^b	1.47 ^{bc}
T _{DB}	1.01	1.29	1.29 ^b	1.58	1.59 ^b	1.41 ^c
T _{IB}	1.06	1.35	1.39 ^{ab}	1.63	2.19 ^a	1.64 ^a
SEM	0.03	0.02	0.02	0.09	0.28	0.02
P-value	0.8628	0.7629	0.1218	0.9551	0.0093	0.0003

Experimental treatments: T_C: control treatment, T_{DF}, T_{IF}: treatment of immersion and injection of hatching eggs with aqueous extract of fenugreek seeds, T_{DO}, T_{IO}: treatment of immersion and injection of hatching eggs with aqueous extract of oats, T_{DB}, T_{IB}: treatment of immersion and injection of hatching eggs with aqueous extract of basil seeds. ^{a,b,c}Means in the same column bearing different superscripts differ significantly (P < 0.05) or (0.01) . SEM = Standard error of means.

Table 5: Effect of immersion and injection of hatching eggs with aqueous extracts of fenugreek, oat and basil seeds in the productive index (PI) of broiler at the age of 35 days.

Treatments	Production index mean
T _C	308.8 ^b
T _{DF}	427.1 ^a
T _{IF}	372.7 ^{ab}
T _{DO}	311.5 ^b
T _{IO}	344.7 ^{ab}
T _{DB}	367.8 ^{ab}
T _{IB}	201.2 ^c
SEM	32.61
P-value	0.0111

Experimental treatments: T_C: control treatment, T_{DF}, T_{IF}: treatment of immersion and injection of hatching eggs with aqueous extract of fenugreek seeds, T_{DO}, T_{IO}: treatment of immersion and injection of hatching eggs with aqueous extract of oats, T_{DB}, T_{IB}: treatment of immersion and injection of hatching eggs with aqueous extract of basil seeds. ^{a,b,c}Means in the same column bearing different superscripts differ significantly (P < 0.05) or (0.01) . SEM = Standard error of means.

of hatching eggs with aqueous extracts of fenugreek, oat and basil seeds in the productive index at the age of 35 days for broilers, significant increase in the treatment of immersion with aqueous extract of fenugreek seeds (T_{DF}), and it was unique by having the highest and best values among the experimental parameters, It increased significantly (P < 0.01) compared to the control treatment and oat extract (T_{DO}), while it did not differ significantly with the treatments of immersion extract of basil seeds (T_{DB}) and fenugreek and oat extract (T_{IF} and T_{IO}). The

lowest mean for PI was recorded at the injection with the aqueous extract of basil seeds (IB), as it decreased significantly in the same characteristic compared to the control and immersion oat extract (T_{DO}) treatments, and the overall means of treatments in this index was 308.8, 427.1, 372.7, 311.5, 344.7, 367.8, and 201.2 for T_C, T_{DF}, T_{IF}, T_{DO}, T_{IO}, T_{DB} and T_{IB} respectively

Discussion

Treatment of immersion in the aqueous extract of fenugreek and basil seeds was able to achieve an increase in body weight for most of the breeding weeks, which is due to the improvement of the characteristics of the hatched chicks and their weight after hatching, and thus may be reflected in the subsequent productive performance. As the use of these extracts as early feeding for embryo helped the development of the body and muscles by stimulating the

development of satellite cells (Kornasio *et al.*, 2011). Which was confirmed by Halevy *et al* (2000). Or the increase in the body weight of birds may be due to the ability of the intestine to better digest and absorb feed by delivering and supporting nutrients to the embryos in the eggs that stimulate the metabolism of the cells of the digestive system. Girardon *et al.*, (1985) reported 39 important compound and nutrients in fenugreek seeds, the aqueous extract of seeds used in the study also included amino acids that are important for embryo growth and development such as Serine and Valine, Aspartic acid and Glutamic acid, threonine, Alanine, γ -Aminobutyric acid and Histidine (Pruthi, 1976; Sankarikutty *et al.*, 1978; Ramachandraiah *et al.*, 1986).

Studies have indicated the presence of saturated and unsaturated fatty acids such as oleic, linoleic and linolenic in these seeds (Mazza *et al.*, 2002). That this relatively high content of some nutritional components and mineral elements, which is found in the form in the gums, has increased embryo development and improved the subsequent productive performance. (Kita *et al.*, 2015; Kermanshahi *et al.*, 2017; Bhattacharyya *et al.*, 2018; Xu *et al.*, 2019; Kop Bozbay and Ocak, 2019), this is confirmed by Azadegan Mehr *et al.* (2014) when injecting 300 ppm of linoleic acid which is effective in increasing the rate of growth and weight gain. When applying early feeding technology to newly hatched chickens and turkeys, Noy and Sklan (1998) and Uni *et al.*, (1999) indicated that it showed a significant improvement in body weight and the size of the Pectoralis muscle. Thus, it increases the size of muscles by 8-10% at the age of

marketing. Or it may be due to the increase in the depth of crypts that appeared in the tissue characteristics, as they have a positive relationship with the increase in the secretion of digestive enzymes, and thus the increase in the surface area of absorption in villi and the ratio between villi height and depth of crypts, which are indicators of the functional and developmental state of the intestine (Samanya and Yamauchi, 2002 ; Xu *et al.*, 2003). Thus, it may be reflected in the utilization of feed more. Or perhaps you explain the reason for increasing body weight in maintaining protein levels in the muscles when hatching. Chen *et al.*, (2009) also demonstrated it to duck embryos. Or perhaps it is due to the digestive ability of the intestine to better digest and absorb feed by applying *in ovo* technology and supporting the development of the embryo and thus stimulates the metabolism of the cells of the digestive system and its development in the last period of fetal growth. As well as an increase in the activity of digestive enzymes secreted from the gut, such as Intestinal disaccharide and Aminopeptidase, which is reflected in future productive performance. Or the effect of fenugreek and basil immersion treatments may be due to the early stimulation of brush border enzymes as shown by Gilbert *et al.*, (2007).

These enzymes facilitate the digestion of sugars and peptides, as well as stimulate the production of the pancreatic lipase enzyme, which has been shown to begin on the 16th day of incubation to facilitate the digestion of the remaining yolk (Noy and Sklan, 1998). Or perhaps it is due to the effect of plant extracts on the genetic expression of genes responsible for digestive enzymes, and that was confirmed by Tako *et al.* (2005) when proving upon injection a solution containing zinc - methionine to increase the gene expression of saccharase enzymes and leucine aminopeptides as well as sodium transporter - glucose and sodium transporter - potassium - ATP.

Also, the use of yolk in the first days of breeding can affect faster to benefit from nutrients in the development of body parts and stimulate rapid growth. As for the effect of water extract of basil seeds on the deterioration of body weight, it may be due to the lack of nutritional efficiency due to the low development of the digestive system. And that the reduced benefit and absorption of the yolk material led to the weakening of the digestive system, which reflected negatively on body weight and weight gain, These results were confirmed by Zarei *et al.*, (2016) when they injected *Silybum marianum* extract as it reduced body weight compared to control. Results of immersion treatments and some infusion treatments as early feeding were consistent with Fouad,

Abdel-Hafez (2017), Nanle *et al.* (2017) and Maiorano *et al.*, (2017). Those who concluded in their studies when injecting an extract containing Laminarin, Fucoidan and Transgalacto oligosaccharides from milk lactose, resulted in a significant increase in muscle formation. However, these results were inconsistent with Abuoghaba (2017) when spraying broiler hatching eggs with ascorbic acid.

The decrease in FCR for the immersion treatments with the aqueous extract of fenugreek and basil seeds is due to the increased efficiency of utilizing the feed intake as a result of achieving the observed development in the gut. These results were not consistent with what was found by Muglali *et al.*, (2016) who injected HMB (β -hydroxy β -methylbutyrate) on the 19th day of incubation, was no significant effect in FCR at day 42 of the breeding. The results were consistent with what Jahejo *et al.*, (2019) found in their study on the effect of using basil seeds (5 g/ kg and vitamin C 200 mg / kg) as additives to rations when breeding broiler to heat stress where they found a decrease in FCR of the addition treatments.

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