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EFFECT OF TWO TYPES OF PROTEINS, BELTS AND HORMONE IN CHICKENS PRODUCTIVITIES

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Abstract

This study was conducted in the Department of Science / College of Basic Education / Mustansiriyah University for the period from 12-15-2021 to 2-15-2022. The research aims to study the effect of the quality of feed, protein and vitamins added to the laying feed used in feeding table chickens and its relationship to productive performance and some traits. The quality of eggs such as egg weight, diameter and height of the yolk, histological study of the ovary, the weight of the ovary in each treatment, before and after the treatment. Non-laying or low-ovulation chickens were injected with FSH at a concentration of I.U / l 75. The effect of hormonal injections on productive performance and some qualitative characteristics was studied. For eggs, such as egg weight, diameter and height of the yolk, histological study of the ovaries, ovarian weight.In this study, 50 brown Lohmann chickens, 8-12 months old, were weighed individually and distributed into 5 groups as follows: The first group, the control, was fed only the diets of laying hens for the duration of the experiment. The second group (the first treatment) for a month was fed with diets for laying hens, to which vitamins and local protein were added, similar in shape to the diets, but different in composition and ingredients. The third group (the second treatment) for a month was fed with diets for laying hens, to which vitamins and protein powder (Swiss origin) were added, different from the composition and components of the local protein above. The fourth group (the third treatment) for a month of the experimental period was fed with diets of laying hens with wheat and barley. The fifth group (the last hormonal injection): For a month of the experiment period, it was fed only laying hens diets. The results showed significant differences in the characteristic of egg production when calculating the general rate, as the production percentage for the second, third and fifth groups was (73.3%, 66.6% and 83.3%), respectively. While the first and fourth treatments gave the lowest percentage of egg production in this comparison. The second and third treatment also gave the highest average egg weight when calculating the general rate compared to the rest of the treatments, as the average was 65 gm, and the average weight of the eggs of the fifth treatment (hormone) was 85 (gm). Significant differences appeared in the rates of egg weight in the five groups. It was also noted that there were differences In the rate of feed consumption, as a decrease was noticed in the quantities of feed consumed by the second and third treatment, and the highest rate of feed consumption was in the hormonal treatment, where it reached (200.5 grams / day / chicken), and the lowest consumption was in the control group, which reached (97.5 grams / day / chicken). Significant differences were seen in the diameter and height of the yolk of the five groups, and the largest diameter was in the hormonal treatment, reaching (0.20 ± 5.5 cm), and the highest height of the yolk in the first, second, and hormonal treatment, reaching (17 ± 0.33, 17 ±

0.25, 17 ± 0.50), respectively. And density in the texture of albumen, which indicates the giving of fodder and protein in appropriate quantities, which resulted in quality in the eggs produced in terms of weight and texture. The results of the dissection also showed the weight of the ovary and the number of eggs, mature follicles and yolks above the ovary increased in the first, second and hormonal treatment) and the largest weight of the ovary was in the treatment It reached (11.8 gm). It is clear from the current research that the type of feed, additives, nutritional supplements, and care for the hygiene and health of chickens have a great impact on obtaining high-quality productive characteristics in the produced eggs. Differences appeared in all treatments in relation to chicken weights, as the live body weight increased and the amount of change in body weight when calculating the general rate, and the highest percentage of weight was in the hormone group, which reached (2600 ± 50 grams).

Keywords: proteins, belts, hormone, chickens productivities

Introduction:

The high percentage of fiber and the high percentage of non-starchy complex sugars in many fodder materials can have a negative impact on the efficiency of the productive performance of the birds. With the scientific development in this field, interest in the use of enzymes increased, especially in the manufacture of fodder based on barley, oats and rye, as it was found that these compounds have a significant impact on improving the nutritional value of these components. And the use of mixtures of external enzymes with feed can achieve a decrease in the degree of viscosity, which is attributed to the presence of non-starchy polysaccharides dissolved in water, and then reduce its harmful effect or get rid of it completely and help the process of decomposing the cellulosic wall surrounding the components of the seed of nutrients, which helps to Its liberation and the benefit of the bird from it and the support of enzymes already present in the digestive system of the bird, such as amylase, proteinase, lipase, and the hydrolysis of some anti-food factors present in many types of raw feed materials [1,2].

Numerous studies have been conducted on the use of materials such as maize fibers and others as a partial or complete substitute for soybean meal in the diet of chicken eggs. [3], did not notice significant differences between egg production rates when replacing soybean meal with safflower meal. [4] indicated that wheat and barley could be used up to 25% without a significant difference between egg production rates. [5] also noted a decrease in egg production when using sunflower and safflower meal as a substitute for soybean meal.

[6] Confirmed that there were no significant differences in the rate of egg production when wheat and barley seeds were replaced with soybean meal at rates of 0.0, 5.0, 10.0 and 15.0% in the diet of chicken eggs. [7] Also did not indicate that there were significant differences in the rate of egg production, which reached 87.1 and 83.6% on diets containing wheat at a rate of 30.0%. As for [8], they noticed that they used yellow corn fiber without a significant difference between the rates of egg production, as the results of the second experiment showed, which indicated a clear deterioration in the rates of egg production significantly when increasing the proportions of wheat, barley and safflower meal in the chicken diet.

There was a significant decrease in egg weight when raising the use of fiber instead of protein or wheat from 12% to 26% in the diet containing 15.5% protein. [4] Did not notice significant differences in the average egg weight when using maize meal in different proportions. [7] Also noted results supporting the results obtained by [4]. However, in a second experiment carried out by the [8], its results showed a significant increase in the average egg weight of chickens fed on diets containing bean meal compared to the control diet that was free of bean meal. The researcher explained the reason for this because the birds used in this experiment had increased their feed consumption rate to compensate for the decrease in the amount of energy consumed, but they failed to do so, and in return they got a large amount of protein and methionine, which played an important role in increasing the weight of the resulting egg. Also, [9] did not notice a significant difference in the average egg weight of 59.7, 60.4, 61.0 and 60.9 g/egg when using bean meal only. As for the results of the second experiment, there was a significant increase in the average egg weight of the chickens that were fed on diets containing 22.0 and 34.0% of bean meal (59.2 and 59.3 gm/egg), respectively, compared to the control diet that was free of bean seed meal (56.4 gm). / an egg) . In their interpretation, the researchers confirmed what was stated by [4] and [10].
[11] Found a significant decrease in the average daily feed intake of birds that were fed on a diet containing safflower meal instead of soybean meal. Other studies also indicated that there were non-significant differences in the amount of daily feed consumed when using substitute materials for wheat and barley in different proportions in the diet of egg chickens [6]. [7] Indicated that there was a decrease in the amount of daily feed consumed by 1.82% when using bean meal at a rate of 30%. And the rate of feed consumption decreased significantly by 0.85% when raising the percentage of barley and maize containing 27% protein and 30% fiber from 12.5% to 24.30% [12], [4] noted an increase in the amount of feed consumed by 0.8, 7.6, and 5.9% when the percentage of bean meal utilization in the diet increased from 0.0% to 13.5, 27.0, and 40.5%, respectively, in the diet, as the consumption rate reached 118, 119, and 127 and 125 gm feed/bird/day, respectively.[8] indicated that the rate of feed consumption in the first experiment increased significantly by 0.85% when raising the proportion of wheat seeds from 25.0% to 36.5%, as the amounts of feed consumed amounted to 116, 116 and 118 gm of feed / bird / day for chickens that were fed on Diets containing different levels of yield (0.0, 25.0 and 36.5%), respectively. [13] and [14] confirmed the existence of significant differences in the rate of feed consumption in the treatment in which soybean meal was used as a major source of protein, and the average amount of feed consumed was 1206.2 gm / chicken, during a period of 28 days, with an average of 43.1 g / day and between the second treatment in which safflower seed meal was introduced into its diet, the average amount of feed consumed was 1220.9 g / chicken meat during the experiment period, i.e. with a daily average of 43.6 g / chick / day, as well as between the third treatment in which safflower meal proteins contributed to its feed by 25 % of the total protein used. The average amount of feed used was 1252.8 gm/chick during the experiment, with a daily average of 44.7 gm/chick/day. [12] Noticed a significant increase in the amount of feed needed to produce a kilogram of eggs. These results matched those of [4]. While [7] did not notice any significant differences in the amount of feed (kg) needed to produce one kilogram of eggs, [6] confirmed that

there was no significant difference in the amount of feed required to produce one gram of eggs. [6] Confirmed that the use of high levels of wheat and barley in the diet of chicken eggs did not lead to a significant variation in the force (kg) needed to break the shell, or in the average thickness of the shell, or in the average specific weight of the egg. Note that the correlation coefficient is high between the thickness of the shell and each of the force needed to break the shell and the specific weight of the egg [15].

As previously explained, the egg needs about 25 hours in its journey through the oviduct until the hen lays a fully formed egg, and it takes about 30 minutes before the next egg is released from the ovary. Meaning that the difference between each two consecutive eggs in the series of eggs is about 25 hours. However, this period varies according to the length of the series and the period that elapses between each two series [16], [17] and [18].

MATERIALS AND METHODS

The devices were used listed below:

sequence	Name of the company/	origin Device name
1	Electronic scale arranged after the separator (1 gram - 5 kilograms)	China
2	Sensitive electronic scale two ranks after the separator (0.01 - 400 grams)	China

3-1-2 The number used, foodstuffs and fodder

I used the tools, foodstuffs and fodder in the table below:

sequence	Manufacturer/origin of tools	foodstuffs and fodder
1	Homemade	dissecting tools
2	Breeding Bird Cages	China
3	National Feed Company / Iraq	Feed for laying hens
4	From the local markets / Iraq	wheat and barley
5	Vitamins	Commercial (from the local markets for bird sanctuaries) / Iraq
6	Protein	Mix/Holland Protein
7	local protein	From the local markets for breeding birds / Iraq with
8	Hormone	/ FSH/ Germany

2 -working modalities

A study was conducted on egg production in local chickens and the effect of feed, its quality, vitamins and hormones on the ovulation process for a period of 30 days.

3- Prepare the chicken

Laying chickens were purchased from the local markets, known as the Lohmann breed (red-white), at the age of (8-12) months. 10 chickens were distributed in each group.

Hens were placed inside cages, with 3 chickens in each cage, with a capacity of 1 m x 50 cm and a height of 50 cm.

With fodder and water only during the day.

4- Collect the eggs

Eggs were collected from (50) chickens per day for a month of the experiment in order to observe the changes that occurred before and after the study. The changes in eggs were studied through:

Egg weight, number of eggs, diameter and height of yolk, weight of ovaries and chicken weight before and after the experiment

5 - Preparing the feed

This experiment was conducted to find out the effect of using two levels of protein (local and imported) and different sources of protein and the overlap between the level of protein and its source on the productive performance of female laying hens, as the protein concentrate was used (the imported vegetable of Syrian origin, which consists of soybean meal and yellow corn, in addition to a mixture of vitamins and minerals) and lysine and methionine. As for the local protein, local fish meal (Local Fish Meal) was used, which was prepared by the Gulf Company for Fisheries and Fish Protein Production / Basra, which consists of non-economic fish that are not consumed by humans. It also used the leftovers of the local poultry slaughterhouses (Poultry Offal Meal) produced by the International Company for Meat Preparation / Baghdad, and it was a mixture of uneaten slaughterhouse wastes such as internal gizzards, chicken heads and legs, and feathers. The mixture of vitamins and minerals imported from the production of the Swiss company Roche was also used in diets containing Animal protein sources and their components. Prepare the new feed by taking the feed for laying hens and adding local protein, vitamins, wheat seeds and barley by mixing 5 kg of feed for laying hens with ½ kg of vitamins and 1/2 kg of the local protein whose ingredients were mentioned above.

As for protein powder of Swiss origin, it was added at the rate of 5 grams (a small teaspoon) to the daily meal provided to chickens, with 5 grams of protein being dissolved in drinking water.

Giving the hormone

After a month of using the feed and discovering some non-laying hens among the chickens, they were injected with ovarian stimulating hormone (75 I.U / l (FSH). The hormone was injected under the skin under the wing.

Productive traits

1- Egg production rate

The eggs were collected once a day and at one o'clock in the afternoon, and the percentage of weekly egg production H.D. was calculated according to the equation reported by[15] as follows:

$$H.D = \frac{\text{The number of eggs produced in a given time period}}{\text{The number of chickens in the rearing barn x the length of the period in days}} \times 100$$

-2- Average egg weight

The eggs of the repeated treatments were weighed weekly by a sensitive scale and the average weight of the eggs of the repeated treatments were extracted weekly during the experiment period. Tuesday of each week was chosen as a date for weighing the eggs.

3- Measure the height and diameter of the egg yolk

Measurement was done with a millimeter ruler.

4- Feed consumption rate (g / bird / day)

The daily fodder was provided freely at eight o'clock in the morning every day, and the fodder was taken from a pre-weighed quantity. At the end of the week, the remaining fodder was collected and weighed, and thus we had the amount of fodder consumed during the week.

The average daily feed consumption (gm / bird) per week was calculated according to the equation mentioned by [19]:

$$\text{The average daily feed consumption} = \frac{\text{The amount of feed consumed per week by one refined bird}}{\text{Number of birds in one replicate x 7 days}}$$

5- The rate of weight gain

The birds of the repeated treatments were weighed individually using a sensitive scale at the beginning and end of the experiment, and according to the rate of weight gain during the experiment period (a gram of weight gain per bird within 30 days) according to the equation reported by [19].

$$\text{The rate of weight gain of the bird} = \frac{\text{Final Weight (gm) - Starting Weight (gm)}}{\text{30 days}}$$

2 Statistical analysis

The experiment was carried out using a randomized complete block design (RCBD) as stated in [20]Snedecor and Cochran (1980), and the statistical analysis of the data was done using the ready-made statistical program [21]SAS (1989). Significant differences between the averages were also determined using the Duncan test, as stated in [22].

Results and discussion:

The characteristic of egg production is the main objective of establishing a project for the production of eggs, whether it is table eggs or hatching eggs. The data of Table No. (1) indicates the presence of significant differences at a significant level of $P < 0.01$ between all treatments and the control group and between the groups in the percentage of egg production, where the percentages were the highest In the second, third and fifth groups, compared to the control group, as the fifth group (hormonally treated) recorded the highest rates of egg production, followed by the second group, which was fed special diets for laying hens with local protein and vitamins, where the number of eggs during a month of the experiment period in the first group was 170 eggs, and in the second group The second 220 eggs, and in the third group (200 eggs) and the fourth group (180 eggs), and in the hormonal treatment it reached (250 eggs). In general, an improvement in egg production rates is noted in the second and fifth groups to a large extent compared to the control group. The reason for this improvement may be attributed to Production leads to an

improvement in the nutritional value and an increase in the chicken's appetite for the used feed mixed with nutritional supplements, which leads to an improvement in production activities in the body at all levels, from feathers to feathers. The weight of the total animal and its increase in production activities, this agrees with [2]. This result is consistent with the recommendations of the company that produces this breed of chicken and with the results reached by [2], who referred to the rates of egg production in this strain, whether pure or hybrid, that takes a natural curve, as production gradually escalates with the age of the animal to reach its peak and then It gradually decreases according to the hen's ovulation cycle. The weight of the egg is a true indicator of its size, which contributes to determining the price of eggs, which represents another goal for breeders of table eggs. It is noted from the results shown in Table (1) that there are significant differences at a significant level of $P < 0.01$ between all treatments for the characteristic of egg weight compared to the control group. The results of the first group (control) indicated a decrease in the weight of chicken eggs, with an average egg weight of (57 ± 0.40). (g) During this period without treatment. In the second and third groups, the average egg weight was (65 ± 0.44 and 65 ± 0.80) g, respectively, as an improvement in egg production was observed in the added treatments, while the decrease in egg weight returned in the fourth group, represented by With diet, wheat and barley after cutting off nutritional supplements and protein, the results agree with [2], where he indicated that there was a decrease in the weight of eggs when using different levels of protein. The protein, the amino acid methionine, the lipid, and the essential fatty acid linoleic acid ready for metabolism within the body have a major role in determining the weight of the egg nutritionally[23] and [24]. Therefore, the high level of fiber worked to reduce the weight of the egg by increasing the bird's need for protein and essential amino acids due to the increase in the loss of internal nitrogen as a result of the fiber's action by removing a layer of cells lining the intestine [25]; [26]. Due to the fibers having a bulky effect, as it stimulates the slow dilatational receptors in the crop to send nerve signals to the central nervous system and the bird's sense of satiety [27]; [28]. It is worth noting that the weight of the egg is affected by the percentage of protein, methionine, or linoleic in the diet, or the amount of these nutrients consumed by the bird per day [29]. Also, the liberation of the Pectinase enzyme as a result of the use of wheat and barley seeds used in our experiment has led to the digestion of pectin, which is present in high proportions in the wall of plant cells in the soybean meal in the ready-made diet, as pectin plays a major role in the deterioration of the productive performance of egg chickens by increasing the viscosity of the contents of the intestine Hence the decrease in the availability of nutrients for chickens[30]. And the deterioration of the body's ability to retain the nutrients contained in the feed ingested due to the high viscosity of the contents of the intestines, which are present in the mixture of enzymes, which, when used, lead to a reduction in the negative effect of pectin substances, as they constitute more than 70% of the total number of non-starchy polysaccharides [31]. The amount of feed consumed is an indicator of the nutritional content of the diet provided to the birds and its efficiency, and it is the determining factor for the efficiency and profitability of production. Table No. (1) shows the data related to the averages of feed consumed by the birds of different treatments during the experiment, and from it is noted that there are significant differences at a significant level ($P<0.01$) in the quantity The

feed consumed for the four treatments and the control group were as follows (97.5 ± 1.20, 150 ± 2.45, 120 ± 1.30, 100.4 ± 2.50, 200.5 ± 1.30), and the highest consumption rate was in the fifth (hormonal) group, while the lowest consumption of feed was in the first control treatment And the fourth treatment: The addition of barley to the fiber components has led to a significant improvement in raising the percentage of ready-made ration use without affecting the percentage of egg production compared to the comparison ration. The birds benefited from the largest amount of nutrients in the diet [8],.Also, the reasons that led to this improvement are that the positive effect of the birds The external source (added to the diet) that decomposes the fibers in increasing the nutritional value of soybean meal, proteins, wheat and barley, and that these enzymes work to increase the coefficient of digestion of nutrients by increasing the efficiency of the internal source enzymes (enzymes produced by the organism's body) in digesting the contents of the endosperm of plant cells of starch, protein and lipid after breaking down the endosperm walls [32];[33] and[34] that consist of peptic materials (uranic acid or polygalacturonide) (Langout). In addition, the formation of these enzymes by barley seeds works to increase the duration of the nutrients stay for a longer period in the intestine [35] and improve the efficiency of absorption of nutrients by canceling or limiting the formation of the non-moving aqueous layer formed by the viscosity of the fibers due to the high susceptibility of pectin materials On holding or retaining water in high quantities, thus shifting between nutrients and absorption units (villi) in the intestine[1] and [36]. Also, the reason for the significant improvement in the weight of the egg compared to the comparison diet when adding wheat and barley is attributed to its role in increasing the readiness of protein and fat, and then the chickens benefit from it [37] and [34].It was noted in Table No. (2) That there was a difference in the height of the yolk and the diameter of the circle of dense albumen in all treatments, and it was noted that there was a higher height in the second, third and fourth treatment compared to the control group. The circle is relatively large in relation to the dense albumen, and the results agree with [2], where he indicated that the quality of the albumen and the height of the yolk is due to the quality of the protein used in the feed. The data in Table No. (2) Indicate that there are differences between all the experimental treatments for live body weight and in the five groups. As it is noted a rise in the weights of the chickens from the beginning of the experiment to its end, but there is a discrepancy between the weights of each chicken. This depends on the structural metabolic rates according to the amount of feed ingested. Significant differences were observed between the groups and the control group at a significant level ($P<0.01$), and the rates of weight gain in the groups were the five were as follows (5%, 16.6%, 20%, 11.6%, 23.3%). Also, the fifth group with hormonal treatment recorded the highest weight and the lowest weight was in the control group. The results agree with [2], where he indicated that the weights increased not in size, but in Feathers and fat in the stomach of the hen and fodder are consumed in the production of eggs. . And the results of egg production, egg weight, egg mass, daily feed consumption and feed conversion coefficient, which are shown in Table (1), represented by the deterioration of those productive characteristics referred to above as a result of the high content of dietary fibers. And the negative effects of fiber can be summarized as either to reduce the amount of feed intake due to the decrease in the volumetric density of the diet[38] or to reduce the amount

of nutrients retained inside the body of the bird necessary to direct them to the activities of growth and production through an increase in the viscosity of the contents of the intestine, which led to a decrease The coefficient of digestion of nutrients, especially starch, protein and fat on the one hand [39]; [40]; [41] and a deterioration in the efficiency of the absorption process due to the formation of a non-moving aqueous layer between the nutrients and the absorption units in the intestine (villi). On the other hand [42and 34].

Significant differences were observed in the weights of the ovaries before the experiment and after the completion of the experiment, as the weight of the ovaries ranged between 5.5-6.5 grams and reached (6.50-11.20) grams after the end of the experiment, where significant differences were observed at a significant level (P<0.01).

The highest increase was recorded in the hormonal treatment, which indicates that the quality of the feed and the protein used contributed to an increase in the size of the ovary and the number of mature follicles, as in pictures No. (2, 3) compared to picture (1), which shows the shape of the reproductive system in the control group. As the two pictures show (5). , 4) the size of the ovaries, follicles and the reproductive system, where the results indicated that the use of the gonads stimulating hormone, the appropriate dose is ½ cc of Gonal-f 75 I.u/l concentration, which was injected into hens (10) other than the linens by half the dose under the wing (under the armpit). The response to the hormone is fast between 3-6 days, as the chickens capable of laying eggs regained their ovaries, but for the chicken that did not ovulate, there was a grease on the ovary, as in the picture (6). Picture No. (8) Shows the difference between an active ovary and an ovulated ovary.

Table No. (1) Shows the percentages of egg production, the number of eggs produced, the average egg weight, and the amount of feed consumed in the experimental groups for a month.

qualities /productive totals	Time periods	Percentage of egg production	Number of eggs produced	Average egg weight/gm	Feed consumption rate bird/day/gram
The first group without treatment (control) A	30 days	.656 %	170	57.5 ± 0.40	97.5 ± 1.20
the second group (first transaction) b	30 days	73.3 %	220	65.4 ± 0.44	150.3 ± 2.45
The third group	30 days	66.6%	200	65.3 ± 0.50	120.2 ± 1.30

(second transaction) C					
Fourth group (third transaction) D	30 days	60%	180	60.2 ± 0.50	100.4 ± 2.50
Fifth group (hormonal injection) E	30 days	83.3%	250	85 ± 0.75	200.5 ± 1.30

There are significant differences between groups A, B, C, D, and E at a significant level ($p<0.01$).
Table No. (2) Represents the height and diameter of the egg yolk and the diameter of the albumen, the weight of the chickens in the experimental groups.

qualities /productive totals	Time periods	Egg yolk height (mm)	Yolk diameter (cm)	Thick albumen diameter	Chicken weight before treatment	Chicken weight after treatment	Weight gain rate
The first group without treatment (control) A	30 days	14 ± 0.25	3.5 سم ± 0.75	7 سم ± 0.24	1850 ± 55.40	2000 ± 50.40	5%
the second group (first transaction) b	30 days	17 ± 0.33	4.5 سم ± 0.50	9 سم ± 0.50	1900 ± 40.50	2400 ± 53.30	16.6%
The third group (second transaction) C	30 days	17 ملم ± 0.25	4.5 سم ± 0.15	9 سم ± 0.50	1900 ± 50.66	2500 ± 40.30	20%
Fourth group (third transaction) D	30 days	16 ملم ± 0.10	4 سم ± 0.55	8 سم ± 0.50	1850 ± 40.50	2200 ± 50.25	11.6%
Fifth group (hormonal injection) E	30 days	17 ± 0.50	5.5 ± 0.10	12 سم ± 0.33	1900 ± 50.40	2600 ± 50.22	23.3%

There are significant differences between groups A, B, C, D, and E at a significant level ($p<0.01$).

Table No. (3) Shows the weight of the ovaries before and after treatment in the experimental groups.

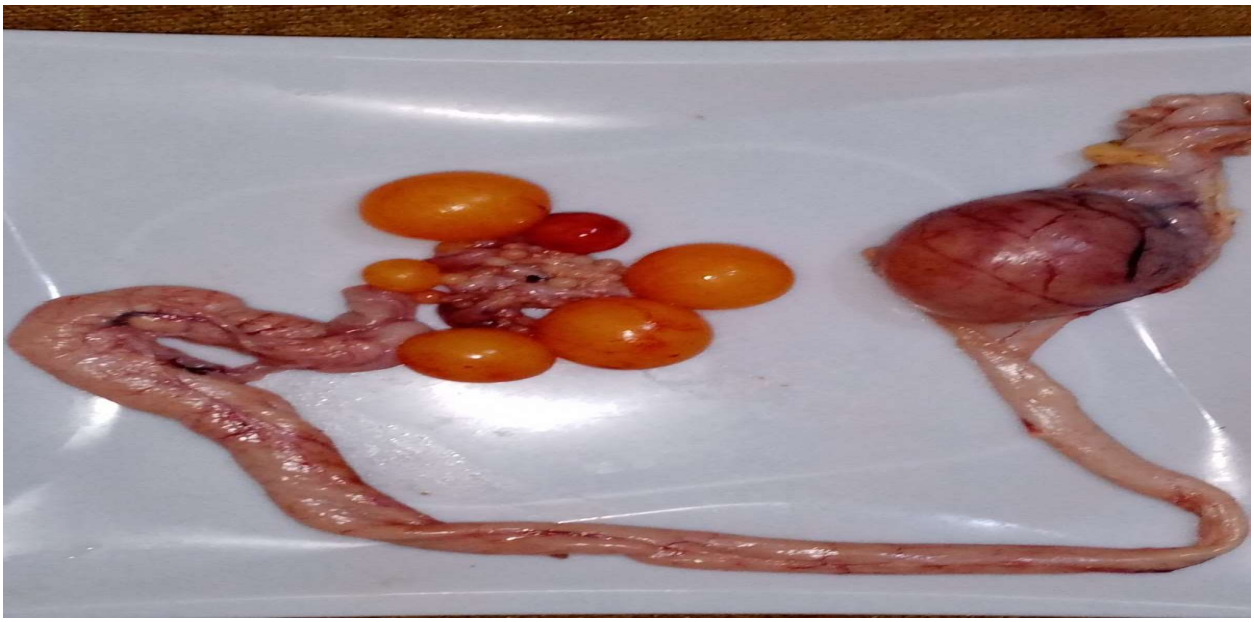
Ovary weight (gm) Totals	before treatment	after treatment
The first group (control) a	5.50 ± 0.10	6.50 ± 0.20
the second group (first transaction) b	5.50 ± 1.10	6.50 ± 1.33
The third group (second transaction) C	5.52 ± 0.45	6.5 ± 0.50
Fourth group (Third transaction) D	5.60 ± 0.44	6.50 ± 0.55
Fifth group (hormonal treatment) E	5.55 ± 0.33	11.20 ± 0.10

There are significant differences between groups A, B, C, D, and E at a significant level ($p<0.01$).

Picture No. (1) Shows the ovaries, mature follicles, the oviduct and the uterus inside it in the control group.

Picture No. (2) of the ovary after the hormonal injection.

Picture No. (3) Shows different sizes of the ovaries after the end of the experiment in hormonal injections.

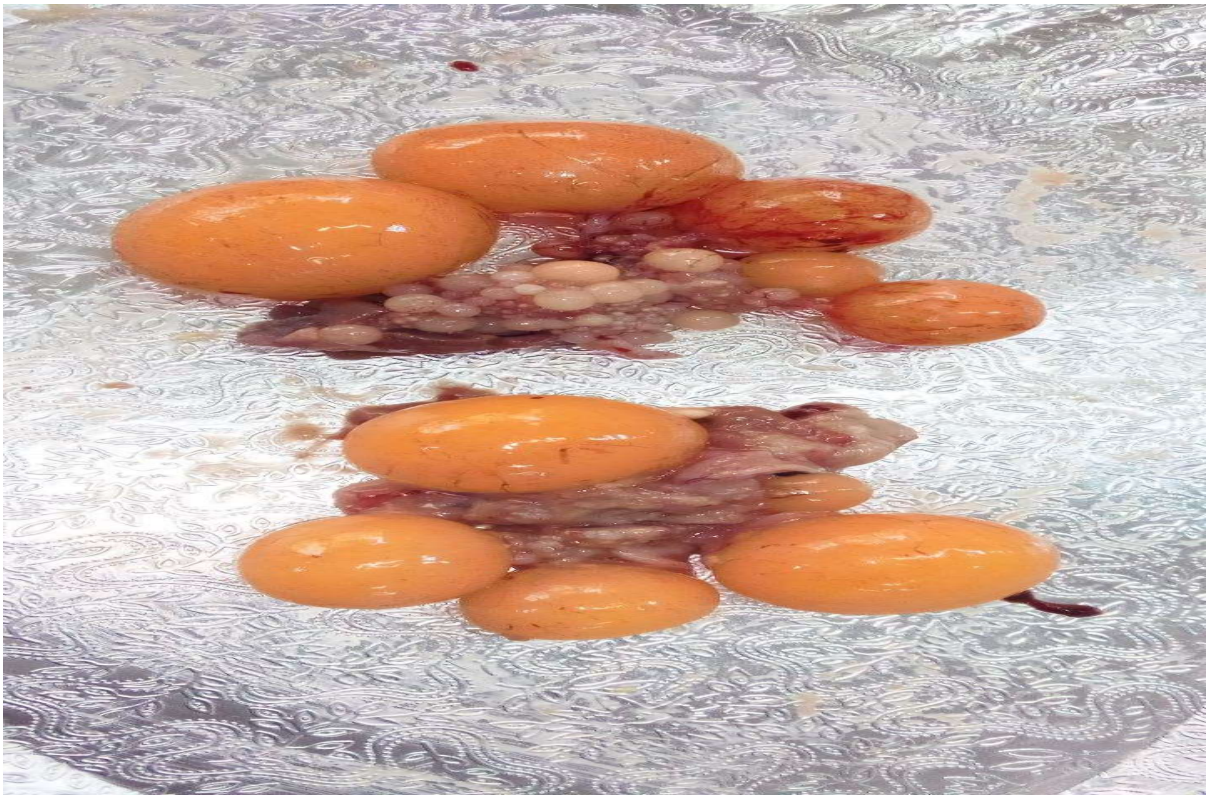


Picture No. (4) of a fertile ovary, oviduct and uterus containing an egg in the second group treated with local protein, wheat and barley.

Picture No. (5) Shows a fertile ovary, an oviduct, and a uterus that contains an egg. In the third group, the diet fortified with imported proteins, wheat, and barley.

Picture No. (6) Shows the stimulation of the ovaries that have finished ovulating after using the stimulating hormone (note the ovarian fatness) with the presence of large numbers of mature follicles.

Picture No. (7) shows the phenomenon of hyper ovulation in chickens producing eggs after being injected with the hormone.



Picture No. (8) Shows an active ovary filled with mature follicles, and at the bottom of it is an ovary at the end of the ovulation period before the eggs are cut off.

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