Effect of Adding Different Levels of Energy and Protein in The Production Performance of Quail

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Abstract

The study was conducted in one of the research farms belong to Department of Animal Production / Faculty of Agriculture at Tikrit University for the period from 11/9/2020 to 16/10/2020 to determine the appropriate diets from energy and protein and impact on the production performance of the developing quail bird. Two Hundred – Forty eight quail chicks with age of 7-35 days. The birds were divided into two treatments, each treatment contained four replicates with 31 birds per replicate. The first treatment was fed on a diet containing 20% protein , energy (2800 Kcal/kg), the second treatment was fed on a diet containing 22% protein , energy (2900 Kcal/kg). The results showed no significant differences in body weight during first, second and fifth weeks, while there were significant differences during the third and fourth weeks while the second treatment recorded an increase as comparison with the first treatment in this description. And the presence of significant differences during the period 2 to 3 sevenths in the rate of weight gain and the absence of significant differences during the remaining periods and there are no significant differences between the treatments in the rate of consumption of feed during the second and third week and the presence of significant differences during the fourth week where the second treatment recorded an increase as comparison with the first treatment and the absence of significant differences during the fifth week and the total period there are no significant differences between the treatments in feed conversion efficiency during the first week and the presence of significant differences during the second week where they recorded an increase as comparison with The first treatment is on the second treatment. There were significant differences between the treatments during the third week, where the second treatment recorded an increase as comparison with the first treatment. There are no significant differences between treatments during the fifth week and total conversion efficiency.

Keywords: Energy, Protein, Productive performance, Quail.

1.Introduction

Nutrition represented about 60-70% of the total cost of poultry production projects . protein and energy are one of the most important components of the diet affecting the growth of birds and their sources are one of the most expensive components of the diet to increase their prices, and this made researchers seek to reduce levels of protein and energy to the least extent possible while maintaining the ratio between them so as not to affect and reducing the cost of high to the extent possible [1]. the researchers had to find the best percentage of energy and protein in quail diets. The main factor affecting the amount of feed consumed is the level of energy in diet and increasing its level in diet leads to a decrease the appetite of bird and lower energy leads to increased. The bird's appetite thus increased feed consumed.

In recent years, quail farming has taken a special place in poultry production [2]. Quail has many desirable qualities that will increase its contribution from Poultry products from animal protein essential for human nutrition [3]. Characterized by early sexual maturity, short generation period and high production of eggs with a high content of vitamins and mineral elements important to humans, quail birds are a biological machine with high nutritional conversion efficiency [4], and have unique qualities in disease resistance and adaptability to various weather conditions and is an ideal experimental animal [5].

Therefore, the study aims to achieve the best level of energy and protein used in quail diets because there is no nutrition guide for the quail and how it affects production performance.
2. Materials and Methods

This study was conducted in one of the research rooms of the Department of Animal Production in college of Agriculture at Tikrit University for the period from 11/9/2020 to 11/1/2021 to determine the appropriate diets of energy and protein and its impact on the productive and physiology performance of the developing quail bird. Phases included breeding chicks up to the age of 35 days. Two hundred and eighty chicks were obtained one day and supplied one of the civil fields in Samarra and the chicks were placed in a room with (2m×3m) after the floor brushes with sawdust (group breeding) and provided with appropriate conditions of heat, lighting and ventilation and gave them an initial diet and at the age of 7 days weighed 248 chicks and distributed randomly to treatments and raised birds in rectangular cages 1 meter long, 1 m wide and 50 cm high, distributed to two treatments covering 4 replicates and 31 chicks per repeater, where they fed on the two diets. First diet contains the energy of 2800 (Kcal/kg) feed and the ratio of raw protein 20% and the second energy 2900 (Kcal/kg) price / kg feed and raw protein ratio 22%. The birds were raised from the age of 7 to 35 days. Measurements were taken for the productive traits (body weight, weight gain, feed consumption and food conversion efficiency) after the age of 35 days.

Growth-specific diets were used according to the treatments used in the experiment and as shown in Table (1). The data were statistically analyzed using the complete random design (CRD) to study the effect of the coefficients on the studied traits, and the significant differences between the means were compared using Duncan's polynomial test [6], and the statistical program [7].

| Ingredients         | Diets                  |
|---------------------|------------------------|
|                     | First | second |
| yellow corn         | 42.3  | 47.6   |
| Wheat               | 20    | 15.32  |
| wheat bran          | 22.85 | ---    |
| Soybean meal (48%)  | 7.35  | 29.58  |
| * protein concentrate | 5   | 5      |
| Calcium carbonate   | 1     | 1      |
| Di-Calcium Phosphate| 1.2   | 1.2    |
| Salt                | 0.3   | 0.3    |
| Total               | 100   | 100    |

** Chemical composition

| Metabolizable energy (Kcal/kg) | 2800 | 2900 |
|-------------------------------|------|------|
| Crude protein (%)              | 20.01| 22   |
| Crude fiber ( % )              | 4.09 | 3.72 |
| Lysine(%)                      | 1.02 | 1.15 |
| Methionine(%)                  | 0.44 | 0.47 |
| Met.+Cys. (%)                  | 0.76 | 0.81 |
| Calcium( % )                   | 0.89 | 0.90 |
| phosphorous( % )               | 0.59 | 0.51 |

3. Results and Discussion

The results in table (2) show that there are significant differences in the rate of weight of the bird during the period 3 and 4 weeks and the absence of significant differences during the period 1, 2 and 5 weeks these results are consistent with the results of [8-10]. The results differed with [11-13], who noted that there were significant differences between treatments with different protein levels in the bird's weight rate for different weeks due to the lack of significant differences Between the treatments, the level of protein 20% and the capacity of 2800 (Kcal/kg) has met the bird's needs for protein and the energy needed to grow.
Table 2. Effect of using different levels of energy and protein in body weight rate (g/bird).

| Age | Treatments | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 |
|-----|------------|--------|--------|--------|--------|--------|
|     |            | body weight rate |        |        |        |        |
| T1  | a0.51±2.54 | a0.56±7.024 | b0.30±105.28 | b0.24±140.37 | a0.65±173.42 |
| T2  | a0.53±4.21 | a0.82±7.024 | a1.21±110.8 | a0.43±142.38 | a1.59±174.75 |

The different letters within the same column indicate significant differences between treatments at a significant level (p<0.05)
The first treatment is the protein content in the diet (20%) Energy (2800 ME) and second treatment protein ratio (22%) And energy (2900 ME).

Table (3) shows that there were no significant differences during the first week and that there were significant differences during the second week, with the second treatment with a protein level of 22% and energy 2900 (Kcal/kg) on the first treatment with a protein level of 20% and a capacity of 2800 (Kcal/kg). And there are no significant differences during the period of 3 and 4 weeks and as a reason there are no significant differences the total weight gain. These results are consistent with those of [14-16], and The Results differed with [17,18], who indicated significant differences between treatments with different protein levels in the rate of weight gain for the different weeks due to the lack of significant differences between the treatments due to the fact that the level of protein 20% and the energy 2800 (Kcal/kg) led to the meeting of the bird's needs of protein and energy The needed for growth.

Table 3. Effect of using different levels of energy and protein in the weight gain rate (gm./bird/week).

| Age | Treatments | Week 2-3 | Week 4-5 | Total weight gain |
|-----|------------|----------|----------|------------------|
|     |            | Weight gain |          |                  |
| T1  | 0.10±27.70a | 35.043±0.73b | 35.08±0.52a | 33.06±0.49a | 130.88±0.29a |
| T2  | 28.95±1.16a | 39.63±0.92a | 31.57±1.58a | 32.37±1.43a | 132.54±1.84a |

The different letters within the same column indicate significant differences between treatments at a significant level (p<0.05)
The first treatment is the protein content in the diet (20%) Energy (2800 ME) and second treatment protein ratio (22%) And energy (2900 ME).

Table (4) shows that there are no significant differences between treatments in the feed consumption rate during the second and third week and there are significant differences during the fourth week where the second treatment recorded an increase as comparison with the first treatment and there are no significant differences during the fifth week and the total period these results are consistent with [14], and The results varied with [3,16].

Table 4. Effect of using different levels of energy and protein in feed consumption rate (g/bird/week).

| Age | Treatments | Week 2 | Week 3 | Week 4 | Week 5 | accumulative feed consumption |
|-----|------------|--------|--------|--------|--------|--------------------------------|
|     |            | Feed consumption |        |        |        |                                |
| T1  | 0±64.52a   | 103.75±1.22a   | 120.16±0.46b | 173.95±2.96a | 462.37±4.53a |
| T2  | 64.52±0.1a | 106.45±1.6a  | 123.6±0.43a | 174.11±2.55a | 468.75±3.36a |

The different letters within the same column indicate significant differences between treatments at a significant level (p<0.05)
The first treatment is the protein content in the diet (20%) Energy (2800 ME) and second treatment protein ratio (22%) And energy (2900 ME).

Table (5) shows that there are no significant differences between treatments in the efficiency of food conversion during the first week and the presence of significant differences during the second week where the first treatment with protein level recorded an increase as comparison with 20% and the energy 2800 (Kcal/kg) on the second treatment with a protein level of 22% and energy 2900 (Kcal/kg). There were significant differences between the treatments during the third week, where the second treatment recorded an increase as comparison with the first treatment. There are no significant differences between treatments during the fifth week and total conversion efficiency. The results are consistent with [2,4,11]. They confirmed that there are significant differences in the food conversion factor when the level of protein in the diet varies and the lack of
significant differences between the treatments is due to the fact that the level of protein 20% and energy 2800 (Kcal/kg) led to the filling of the bird's needs of protein and energy the needed for growth.

**Table 5.** Effect of adding different levels of energy and protein in feed conversion efficiency.

| Age | Treatments | week 2 | week 3 | week 4 | week 5 | accumulative Conversion efficiency |
|-----|------------|--------|--------|--------|--------|-----------------------------------|
|     |            | ±      | ±      | ±      | ±      | ±                                 |
| T1  | 0±2.32     | 2.96±0.03 | 3.42±0.06 | 5.26±0.13 | 3.53±0.04 | a                                 |
| T2  | 2.23±0.08  | 2.68±0.04 | 3.94±0.18 | 5.40±0.21 | 3.53±0.05 | a                                 |

The different letters within the same column indicate significant differences between treatments at a significant level (p<0.05)

The first treatment is the protein content in the diet (20%) Energy (2800 ME) and second treatment protein ratio (22%) And energy (2900 ME).

**Conclusions**

It is clear from this study that it is possible to reduce the level of energy and crude protein in growth diet of the quail, and that the protein level is 20% and the energy of 2800 kilocalories leads to the fulfillment of the bird's protein and energy needs for growth.

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