

## The Effect of Feeding Starter Diets for Different Periods on Performance of Broilers

تأثير تغذية صيصان اللحم بعلف بادئ لفترات مختلفة على زيادة الوزن النهائي

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### Abstract

A total of 150 birds were used in this experiment in summer 2002 to investigate the effect of feeding starter diets for different periods on the performance and the economical advantages on broiler chicks. Birds were fed starter diets for two, three and four weeks prior to feeding the finisher diets. Birds fed the starter for four weeks had higher ( $p<0.05$ ) average final weights, more ( $p<0.05$ ) gain per day, more ( $p<0.05$ ) feed intake and lowest ( $p<0.05$ ) feed conversion efficiency. Feeding the starter for two weeks caused the lowest ( $p<0.05$ ) cost of gain as opposed to other feeding groups. The results of the experiment showed that feeding starter rations for more than two weeks had no economical advantages according to the local starter feed prices.

**Keywords:** Broilers, starter diets, performance, feed intake.

### ملخص

تم استخدام ١٥٠ طيراً من صيصان اللحم بشهري تموز - اب ٢٠٠٢ لدراسة مدى تأثير التغذية بعلف بادئ لفترات مختلفة على زيادة الوزن النهائي والتكلفة الاقتصادية، حيث غذيت الصيصان على علف بادئ لفترة اسبوعين، ومجموعة ثانية فترة ثلاثة اسابيع، ومجموعة ثالثة فترة اربعة اسابيع، قبل تغذيتها على علف نهائي حتى عمر ٤٢ يوماً. وجد أن تغذية الصيصان على العلف البادئ لمدة اربعة اسابيع، أدت إلى زيادة معنوية ( $p<0.05$ ) في الأوزان النهائية، وكذلك في معدلات الزيادة اليومية وكمية الغذاء المتناول، بينما أدت إلى انخفاض معنوي ( $p<0.05$ ) في الكفاءة التحويلية، وقد أدت التغذية على علف بادئ لفترة اسبوعين إلى انخفاض معنوي ( $p<0.05$ ) في التكلفة مقارنة بالمجاميع الأخرى. بينت نتائج التجربة أن التغذية على علف بادئ لفترة أكثر من اسبوعين كانت غير اقتصادية بناء على الاسعار المحلية لهذا النوع من العلف.

### 1. Introduction

Poultry industry is one of the major branches of animal sectors in Palestine (Palestinian Ministry of Agriculture, MoA, 2000). It contributes about 35% of the

animal production income (Abo Omar, 2000). One of the major obstacles in poultry farms is the higher price of feed stuff, where feed constitutes about 75% of total cost in poultry industry (Rabayaa et al., 2001). Several feeding program are adopted locally. Some practices involved feeding starter diets for seven days while others consider feeding starter diets for two (NRC, 1994) or four weeks (NRC, 1984; Abo Omar, 1992). Each practice has its advantages, however, no information are available about the most appropriate practice in regard to its effect on performance of broilers and economical benefits.

The objective of this study is to investigate the performance of broiler chicks fed starter diets for different periods.

## 2. Materials and Methods

### 2.1 Diets

The diets used in the study are shown in Table 1. Diets are similar to commercial broiler diets. The starter diets contain 22% crude protein and 2900 kcal/kg diet. While the finisher diets include 19% crude protein and 3200 kcal/kg diet. The starter diets were fed for two, three and four weeks prior to feeding the finisher diets till 42 days of age, respectively.

**Table (1):** Calculated composition of broiler rations used in the feeding trial (starter and finisher) (%):

| Nutrient               | Starter, % | Finisher, % |
|------------------------|------------|-------------|
| Diet composition:      |            |             |
| Yellow corn            | 21         | 10          |
| Wheat                  | 32         | 44.4        |
| Soybean meal           | 39         | 31.4        |
| Dicalcium phosphate    | 1.6        | 1.6         |
| Limestone              | 1.4        | 1.0         |
| Oil                    | 4          | 0           |
| Premix                 | 1          | 9.          |
| Chemical analysis:     |            |             |
| Dry matter             | 87         | 87          |
| Crude protein          | 22         | 19          |
| Crude fiber            | 3          | 3           |
| Crude fat              | 4          | 0.0         |
| Calcium                | .90        | 90.         |
| Phosphorus (available) | .60        | 6.          |

...continue table (1)

| Nutrient             | Starter, % | Finisher, % |
|----------------------|------------|-------------|
| Manganese, ppm       | 80         | 80          |
| ME, kcal/kg          | 2900       | 3200        |
| Methionine + cystine | .00        | 0.          |
| Lysine               | .9         | 80.         |
| Ash                  | 0.0        | 0           |

## 2.2 Birds

A total of 150 unsexed day-old chicks of Hubbard strain were purchased from a local hatchery and divided into three groups of 50 chicks each. Each group was partitioned into five replicates with 10 chickens in each. Chicks were raised in floor pens. Feed and water was provided ad-libitum. Feed consumption and weight gain were recorded on weekly basis until termination of the experiment when birds were 42 days old.

## 3. Statistical Analysis

All data were analysed using Steel and Torrie (1980) procedures. The Duncan Multiple Range Test (Duncan, 1955) was used to separate treatments' means.

## 4. Results and Discussion

### 4.1 Body Weight

The results observed are consistent to those reported by other workers when broilers were fed commercial broiler diets (Abo Omar, 2000; Rabayaa et al., 2001). Feeding the starter diet for four weeks significantly increased ( $p < 0.05$ ) the average final weight of broilers during the first five weeks of the experiment (Table 2). Results indicated that duration of feeding starter diets caused a significant increase in body weight. Feeding the high protein diets for long period (four weeks) might decrease the energy intake required by birds that was obtained from the extra protein intake. The results of this research are consistent to NRC (1994) recommendations which indicated that starter should be fed only for three weeks.

Birds fed starter diets for four weeks gained significantly more ( $p < 0.05$ ) as opposed to birds in other feeding groups (Table 2).

**Table (2):** Body weight, feed intake and feed conversion ratios of broilers fed starter diets for different periods (mean  $\pm$  SE)

| Group                             | Starter for two weeks | Starter for three weeks | Starter for four weeks |
|-----------------------------------|-----------------------|-------------------------|------------------------|
| Weeks                             |                       |                         |                        |
| Initial weight                    | 40                    | 39.5                    | 40.5                   |
| Weight at 35 days                 | 1663.0 $\pm$ 20.1b    | 1671.0 $\pm$ 22.0 b     | 1752.0 $\pm$ 24.0 a    |
| Weight at 42 days                 | 2015.0 $\pm$ 32.0 b   | 2018.0 $\pm$ 36.0 b     | 2142.0 $\pm$ 32.6 a    |
| Weight gain (g per chick per day) | 46.4 $\pm$ 2.1 b      | 46.7 $\pm$ 2.1 b        | 49.0 $\pm$ 2.0 a       |
| Feed intake (g per chick per day) | 85.0 $\pm$ 3.0 b      | 87.0 $\pm$ 2.9 b        | 93.0 $\pm$ 2.5 a       |
| Feed: gain ratio                  | 1.83 $\pm$ .05 c      | 1.86 $\pm$ .06 b        | 1.89 $\pm$ .05 a       |
| Cost of 1 kg ration               | 0.22                  | 0.24                    | 0.25                   |
| Cost of 1 kg gain                 | 0.40 c                | 0.44 b                  | 0.47 a                 |

Rows of different letters are significantly different at level of ( $p < 0.05$ )

#### 4.2 Feed Intake

Birds fed the starter rations for four weeks consumed significantly more ( $p < 0.05$ ) feed as opposed to other birds during both 5 and 6 weeks of age (Table 2). The experiment showed that birds fed the starter diets for more than three weeks consumed significantly more ( $p < 0.05$ ) feed as opposed to birds consumed the starter diets for two and three weeks when feeding trial was extended to six weeks. Again, it is not common to feed birds longer than five weeks as they reach their marketing weight at this time.

Gain values were similar to other values reported by other workers when starter diets were fed for two weeks (Rabayaa, 2000).

#### 4.3 Feed Conversion

Broilers fed starter diets for two weeks were significantly most efficient ( $p < 0.05$ ) in converting feed to gain as opposed to other birds. Similarly, the feed conversion efficiency was better ( $p < 0.05$ ) in birds fed starter diets for three weeks as opposed to birds fed starter for four weeks (Table 2). The high intake of feed observed in birds fed starter for the longest period explained the lowest feed conversion observed in these birds. The feed conversion efficiencies in all feeding regimes were similar to values reported by other researchers (Abo Omar, 2000; Rabayaa et al., 2001; Rabayaa, 2000; Rahman et al., 2002).

#### 4.4 Cost of Gain

The cost of gain was the highest ( $p < 0.05$ ) in birds fed the starter diets for four weeks followed by birds fed the starter for three weeks and birds fed starter for two weeks had the lowest ( $p < 0.05$ ) cost of gain. The high price of starter feed caused the increase of the overall ration then increased the cost of gain (Table 2). The results indicated that feeding starter for periods more than two weeks had no economical value.

#### 5. Conclusions and Recommendations

This research indicated that feeding starter for periods more than two weeks was of no economical advantages since cost of gain was significantly high when it was fed for longer periods. The high cost of starter feed made it least feasible to feed it for long periods.

More research is needed to investigate the effect of feeding starter diets for longer periods on the carcass quality and other parameters as the dressing percentages.

#### 6. References

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