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ANSInet
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorijps@gmail.com

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# Effect of Post-hatch Feeding on Broiler Performance

A.A. Saki
Department of Animal Science, Bu-Ali Sina University, Hamadan, Islamic Republic of Iran

**Abstract:** Broiler performance in the end of rearing period may be influenced by post-hatch feeding. Four hundreds and eighty Arian day-old chicken was placed in 4 treatments with four replications and 30 chicken in each. This experiment was arranged in complete random design (CRD). Twelve hours fasting, corn feeding, starter feeding and 24 hour fasting were used as a treatments. No significant differences (P>0.05) were observed in feed intake and feed conversion ratio in 7, 14, 21, 35 and 42 day old chicken. The organelles (legs, wings, back, breast meat, Abdominal fat, full intestinal, gizzard and neck) had shown similar reaction. Body weight increased significantly (P<0.05) by starter feeding compared with other treatments in seven and forty two days. The result of this study has shown that starter feeding (in first 24 hours) had the desirable performance in comparison with other treatments.

**Key words:** Post-hatch feeding, broiler chicken, Arian

## Introduction

Several investigations have shown that chicken weight in six and seven week old had the linear relationship with their weight in the first week of rearing. This was not due to the breeder age and day old chicken weight (Pezeshkian, 2002). Post–hatch feeding (after drying and preparing chicken in hatchability) could affect on broiler performance during the rearing period. Over the several years ago (80 years ago) broiler chicken was reach by 16 weeks of age to the slaughter weight. But by the now, they will approach during 6-8 weeks in slaughter weight (Pezeshkian, 2002). In fact this reducing of rearing period to make priority in feeding in first week of life. Since with gradually reduction of rearing period the first week of life is being more important compared with the next coming weeks. That means this ratio was changing from 1/16 to 1/8 or 1/6. On the other hand this period increasing by 15% of rearing period (Pezeshkian, 2002; Dibner, 1999). Some of the researches have noted that using a period as pre-starter before starter feeding for helping to chicken growth rate is very necessary (Nobakht, 2001).

The most content of yolk sacs could be absorbed by this pre-starter feeding during first 3-4 days of broiler chicken life. This ration may be more expensive than general of starter feeding, but such feeding was manipulated in the short period (3-4 days) Turner *et al*., 1999. for this, it could not be able to significant effect on ration price in the end of rearing period. Therefore, broiler feeding in the first days of life is one of the priority factor that could effect on growth, feed efficiency, uniformity and finally economic beneficial. Since those broiler chicken that were not growing very well during in first two weeks of life they will carry out this negative effect until the end of the their rearing. The different results were achieved by 18, 24 and 72 hours as a per-starter feeding. For this reason using different treatments in the different managements regarding various condition of regions may show the change reaction in the matter. In addition the effect of season could not be ignored in this respect.

Table 1: Ingredient of basal diet

| Ingredient | Starter (%) | Grower (%) |
|---|---|---|
| Corn | 50 | 50 |
| Wheat | 10 | 15 |
| Soybean Meal | 30 | 25 |
| Fish Meal | 6 | 6 |
| Sunflower Oil | 1.5 | - |
| Bone Meal | 1.5 | 2 |
| DL- Methionine | 0.35 | 0.35 |
| L- Lysine | 0.2 | 0.2 |
| Pre Mix | 0.45 | 0.45 |
| Total | 100 | 100 |

Reefer to conducted works in this area, still there is the question that what is the effect of post-hatch feeding on broiler performance in Hamadan province in Iran. Based of this idea this study has been arranged to examine such unknown effect.

## Materials and Methods

Four hundred and eighty Arian broiler chickens with 40 grams average weight in 4 treatments were used. These includes: first 12 hours fasting, 24 hours fasting, 24 hours corn feeding and 24 hours starter diet. Experiment was conducted in complete random design (CRD) with 4 replications in each treatment and 30 experiment units (30 chickens) were used in each. After 24 hours similar starter and grower feeding were used for all treatments. They included: corn, soybean meal, wheat, fish meal, vitamin and mineral supplementation. These ingredients are presented in Table 1. Growing rate, feed intake, body weight and feed conversion ratio were tested in 7, 21, 35 and 42 days of age. Abdominal fat, organelles weight, legs, wings, back, breast meat, full intestine, gizzard, neck as well as finger ash were recorded in the end of rearing period. Chickens were divided into the 4 treatments based on the similar average body weight. No restriction was arranged in water consumption during this experiment. Rearing

Table 2: Chemical composition of basal diet (%)

| | M.E. (K Cal./Kg) | EE | C.F. | D.M. (%) | C. P. |
|---|---|---|---|---|---|
| Starter | 2947.89 | 23.10 | 93.00 | 5.0 | 8.27 |
| Grower | 2836.70 | 22.55 | 92.10 | 4.3 | 4.33 |
| Corn | 3200.00 | 8.49 | 92.00 | 3.3 | 4.41 |

ME, metabolizable energy; CP, crude protein; DM, dry matter; CF, crude fibre; EE, eter extract

Table 3: Feed Intake (g/chick)

| Treatment | 7 d. | 14 d. | 21 d. | 35 d. | 42 d. |
|---|---|---|---|---|---|
| Fasting (12 Hour) | 85.16 | 322.36 | 768.90 | 2423.30 | 3423.35 |
| Corn | 80.54 | 305.90 | 768.70 | 2454.25 | 3455.47 |
| Starter | 82.00 | 300.00 | 717.76 | 2300.96 | 3300.96 |
| Fasting (24 Hour) | 86.99 | 309.96 | 741.95 | 2346.52 | 3354.53 |

No differences were found between treatments, d, day.

Table 4: Body weight (g) at different ages

| Treatment | 7 d. | 14 d. | 21 d. | 35 d. | 42 d. |
|---|---|---|---|---|---|
| Fasting (12 Hour) | $103.00^{b}$ | 232.03 | 505.37 | 1520.50 | $1777.50^{b}$ |
| Corn | $103.90^{b}$ | 237.75 | 479.75 | 1481.50 | $1870.00^{ab}$ |
| Starter | $109.50^{a}$ | 244.45 | 532.00 | 1512.75 | $1905.75^{a}$ |
| Fasting (24 Hour) | $10467^{b}$ | 234.00 | 504.00 | 1533.75 | $1890.00^{a}$ |

a, b means in columns with no common superscript are different significantly (P<0.05), d, day.

Table 5: Feed Conversion ratio (FCR) at different ages

| Treatment | 7 d. | 14 d. | 21 d. | 35 d. | 42 d. |
|---|---|---|---|---|---|
| Fasting (12 Hour) | 1.45 | 1.72 | 1.67 | 1.64 | 1.98 |
| Corn | 1.33 | 1.57 | 1.73 | 1.7 | 1.89 |
| Starter | 1.31 | 1.53 | 1.48 | 1.57 | 1.78 |
| Fasting (24 Hour) | 1.43 | 1.64 | 1.61 | 1.58 | 1.81 |

D, day.

Table 6: Effects of different treatments on body composition

| Treatment | Tibia Ash | Breast meat | Legs | Neck | Liver & Heart | Gizz-ard | Intes-tine | Abd. Fat | Back | Wings | Fem. | Carcass |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fasting (12H.) | $13.85^{ab}$ | 386.6 | $90.8^{a}$ | 109.4 | $64.2^{b}$ | 59.4 | 124 | 30.2 | 340 | $164^{a}$ | 416 | 1846 |
| Corn | $15.52^{a}$ | 350.0 | $77.6^{b}$ | 94.4 | $53.6^{b}$ | 52.2 | 126 | 22 | 298 | $136.6^{b}$ | 369 | 1690 |
| Starter | $13.24^{b}$ | 348.0 | $65.2^{c}$ | 101.0 | $79.3^{a}$ | 56.6 | 130 | 28.9 | 294 | $140.8^{b}$ | 356 | 1689 |
| Fasting (24H.) | $14.36^{ab}$ | 346.0 | $86.3^{ab}$ | 90.9 | $62.6^{b}$ | 60.0 | 126 | 18.9 | 288 | $155.3^{ab}$ | 361 | 1740 |

a, b and c means in columns with no common superscript are different significantly (P<0.05). abd, abdominal; H, hour; Fem, Femur.

condition such as lighting regime, moisture, ventilation were optimized for all treatment groups. Two chickens were slaughtered in each replicate to examine body compartments which are shown in Table 3.

## Results

Chemical composition were presented in Table 2 for starter, grower and corn diets. As it appears in Table 3 and 5 no differences were observed in feed intake and feed conversion ratio. Liver weight in the starter diet was significantly higher (P<0.05) than other treatments in the end of first week. In contrast no differences were found in liver weight at 14, 21 and 35 days of age. Where that live weight was increased significantly (P<0.05) by starter diet and 24 hours fasting regime at 7 and 42 day old chickens compared with other treatments. In different part of body weight such as wing weigh in 12 hours fasting diet; heart and liver weight in starter diet were significantly increased (P<0.05) in comparison with other treatments. Tibia ash percentage in corn diet and legs weight in 12 hours fasting were significantly (P<0.05) greater than other treatments (Table 6).

## Discussion

Nutrient utilization is dependent to digestible and absorption in gastrointestinal tract (G.I.T). Developing and growth were occurred in GIT by increasing post hatch feeding. This could an increased enzymes secretion from (GIT). The effect of these enzymes on feed digestion and absorption are due to duration of feed which remain in (GIT) Griffiths, *et al.*, 1977. Finally an increased in growth and nutrient absorption are made by these reflections.

In present study, body weight was decreased by those chickens which was not accessed to feed compared whit that groups which was fed by starter diet immediately after hatching. This was confirmed by other researches (Deaton, 1995). Size and weight of different part of GIT were corresponded with body weight in post-hatch-starter-feeding (katanbaf *et al.*, 1988; Noy and

Sklan, 1995; Pinchasov and Noy, 1994; Sell *et al*., 1991). In addition this survey has indicated that there was no differences in abdominal fat between treatments. This point was confirmed by other researches (Deaton, 1995; Fontana *et al*., 1993; Griffith *et al*., 1977; Scheidler and Baughman, 1993; Summers *et al*., 1990; Turner *et al*., 1999; Yu *et al*., 1990). They also stated that no, response has observed in abdominal fat at 41, 47 and 49 days of age chickens which fed by ad-libitum and restricted feeding (Pinchasov and Jensen, 1989; Rosebrough *et al*., 1986). Liver weight was higher by post-hatch-starter feeding, compared with other treatments. It was demonstrated that development of different segments of intestinal tract was different during the rearing period (Bean *et al*., 1979 and Deaton, 1995). Day-old body weight (40 gram) was increased to 500g till 21 days of age, this range changing was more highlighted in post-hatch-starter diet compared with the other treatments. Feed intake at 7 days old was 7gram and increased to 62g by 21 days of age this was lower in the post-hatch-starter diet. In comparison of other groups, this was also noted by Noy and Sklan, 1995 and 1999; Noy *et al*., 2001. Feed conversion ratio was improved by post-hatch-starter diet corresponding other treatments this was not significant. No corn ration in first 24 hours of life has effect on broiler performance. Feed intake was increased by post-hatch-starter feeding treatment compared with other treatments in 7 to 14 days. This was supported by Noy and Sklan, 1999 and Uni *et al*., 1995. .Increasing high performance was observed by using hatch- supplementation carbohydrates and fat during the first hours of chicken life (Sell *et al*., 1991 and Turner *et al*., 1999). Therefore the results of researches in this study have shown that broiler performance was reduced by restricting feed after hatch. Since reduction in growth and absorption intestinal surface secretion mucus of GIT digestion and absorption were indicated by restricting post-hatch feeding broiler. It is suggested that from hatching to rearing place may takes 24 or 48 hours, Since for improving broiler performance it is necessary to insure providing hatch supplementation diet to supporting growth rate. Yolk sacs in new born chickens containing high sources of fact, in other hand this lipid could not to be converted to carbohydrate and glucose, because in the first day of life in this study have shown that developing and increasing growth rate of chickens GIT could be approached by using starter diet. Further investigation need to be clarified the effect of seasonal in reaction of post-hatch feeding on broiler performance.

## References


Bean, W.L., J.A. Cherry and W.D. Weaver, Jr. 1979. Intermittent light and restricted feeding.

Deaton, J.W., 1995. The effect of early feed restriction on broiler performance. Poult. Sci., 74: 1280-1286.

Dibner, J., 1999. Avoid and delay. Feed Int., 20: 30-34.

Fontana, E.A., W.D. Weaver, Jr., D.M. Denbow and B.A. Watkins, 1993. Early feed restriction of broilers: Effects of abdominal fat pad, liver and gizzard weights, fat deposition and carcass composition. Poult. Sci., 72: 243-250.

Griffiths, L., S. Leeson and J.D. Summers, 1977. Fat Deposition in broilers: Effect of dietary energy to protein balance and early life caloric restriction of productive performance and abdominal fat pad size. Poult. Sci., 56: 638-646.

Katanbaf, M.N., E.A. Dunington and P.B. Siegel, 1988. Allomorphic relationships from hatching to 56 days in parental lines and f1 crosses of chickens selected 27 generations for high or low body weight. Growth Development Aging, 52: 11-22.

Nobakht, A., 2001. Primary nutrition of broiler , Poult. Jahan, vol.17, 18, p: 25-45.

Noy, Y., A. Geyra and D. Sklan, 2001. The effect of early feeding on growth and small intestinal development in the post hatch poultry. Poult. Sci., 80: 912-919.

Noy, Y. and D. Sklan, 1995. Digestion and absorption in the young chick. Poult. Sci., 74: 366-373.

Noy, Y. and D. Sklan, 1999. Energy utilization on newly hatched chicks. Poult. Sci., 78: 1750-1756.

Pezeshkian, S., 2002. Utilization of standard-prestarter feed formulation flour corn, calcium propionate in primary nutrition of chicken. Jahan Poult., 9:13-15.

Pinchasov, Y. and Y. Noy, 1994. Early postnatal amylolysis in the gastrointestinal tract of turkey poults (*Meleagris gallopavo*). Comparative Biochemistry and Physiology, 106: 221-225.

Pinchasov, Y. and L.S. Jensen, 1989. Comparison of physical and chemical means of feed restriction in broiler chicks. Poult. Sci., 64: 348-355.

Rosebrough, R.W., N.C. Steele, J.P. Mc Murtry and I. Plavnik, 1986. Effect of early feed restriction in broilers. II. Lipid metabolism. Growth, 50: 217-227.

Sell, J., C.R. Angel, F.J. Piquer, E.G. Mallarino and H.A. Albatshan, 1991. Developmental patterns of selected characteristic of the gastrointestinal tract of young turkeys. Poult. Sci., 70: 1200-1205.

Scheidler, S.E. and G.R. Baughman. 1993. Computerized early feed restriction programs for various strains of broilers. Poult. Sci., 72: 236-242.

Summers, J.D., D. Spratt and J.L. Atkinson, 1990. Restricted feeding and compensatory growth for broilers. Poult. Sci.,1855-1861.

Turner, K.A., T.J. Applegate and M.S. Lilburn, 1999. Effects of feeding high carbohydrate or fat diets. 1. Growth and metabolic status of the posthatch poultry following immediate or delayed access to feed. Poult. Sci., 78: 1537-1580.

Uni, Z., Y. Noy and Y. Sklan, 1995. Posthatch changes in morphology and function of the small intestines in heavy and light strain chicks. Poult. Sci., 74: 1622-29.

Yu, M.W., F.E. Robinson, M.T. Clandin and L. Bodmar, 1990. Growth and body composition of broiler chicks in response to different regimens of feed restriction. Poult. Sci., 69: 2074-2081.