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Investigating the affected methods in the first 48-hours of nutrition on performance of broiler chicks

Orang Esteghamat

Department of Animal Science, Astara Branch, Islamic Azad University, Astara, Iran

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ABSTRACT

The experiments to evaluate the effect of different feeding methods on weight gain of broilers were reared in the first 48 hours of nutrition. In this study 480 broiler of chicks were used in a completely randomized design. Rations were: 1: Water + initial grain (Crumble), 2: water + sugar + Early grain (Crumble), 3:water + feed opening (Crumble) + Multi-vitamins and electrolytes, 4:water + sugar + initial grain (Crumble) + Multi-vitamins and electrolytes, 5:water + cornstarch + multi-vitamin and electrolyte and 6: water + initial feed (mesh) + were multivitamins and electrolytes. Each treatment had four replicates and each replicate contained 20 chicks. The total period of weight gain, water treatment + initial grain (crumble) + Multi-vitamins and electrolytes showed the highest yield among the treatments . These results indicate that the initial, growth and end period, use of the whole grain in form of Crumble along with water and multivitamin and electrolytes had the best performance in terms of weight gain, and use of sugar in water did not have positive efficiency. Chicks access the full grain in form Crumble and water, multivitamins, and electrolytes was provided in the first 48 hours have been eating more. In the whole period, the treated water + grain + multivitamins and electrolytes significantly had lower FCR than the diet contain, water+ initial seed (Crumble) but in the sense of carcass yield and percent of mortality there is no significant difference observed between treatments (P <0.05).

Keywords: nutrition, performance, carcass yield.

INTRODUCTION

In the past two decades, the age of 2 kg chicken production has dropped from 60 days to less than 40 days .It averages, today the first week of live broiler chicks life is 20 percent of its whole life, while it was only 10 percent in the past 20 years. This rapid growth during the first week of life needs management. Decline in performance due to poor management isn't compensable because there is no chance [1]. Usually chicks after lay, spend time in their incubators. This time can have a negative impact on the future performance of broilers [2]. The first days of chicks' life after leaving egg are the important part of their growing.

In addition, considering to environmental conditions that are very important in incubation and also maintaining hygiene for preservation nutrients against and risk of contamination that obtained during the transfer period from feeding the yolk sac to the first independent ration, have important role. How to feed the chicks immediately after hatching, has a large impact on her performance in the end of aviculture period . In other words, start the herds breeding simultaneous with feeding and accurate management which makes birder can supply complain herd with uniform weight that is desirable in terms of food conversion efficiency and mortality to market.

Reduction of aviculture period caused that birds feeding in the first week to be more important. Because gradually decreasing in duration of growing period, importance of the first week in the phase of time is increased towards the

rest of growing period. This averages that if in the past eighty years, the first week, made up of one- sixteenth developments term, now it has about one-sixth.

Before arrival of chicks, the hall should be carefully considered. After a poor start, there is little time for contamination broiler chicks growth that whole long of their life time is only 1000 hours. So, each hour includes 0.1 percent of chicken life. In a 24-hour period, 2.4% of performance can be losing. Many manufacturers know that waste of performance in first day or the first wee will be reflected in final yield [1]. Way of feeding immediately after hatching chicks can have more effects on performance of herd in the final period.

In other words, start the herds breeding simultaneous with feeding and accurate management which makes birder can supply complain herd with uniform weight that is desirable in terms of food conversion efficiency and mortality to market [3].

Poultry chickens fed immediately after entering the aviculture hall, it is essential for the growth and development of digestive tract of chickens. Gastrointestinal growth in the first days of life, is faster than body growth. So suitable fed of chicks, will have a significant impact on growth and development of digestive system [2].

So for being success in this affair, regarding the principles of proper nutrition and management is necessary especially in the first week. Birders in different regions, based on gained experiences, using different ways in management and chickens fed in the first 48 hours of training. Use of sugar, cornstarch, mesh form grain or Crumble and … are among these methods.

MATERIALS AND METHODS

Implementation of this project lasted 42 days. Experimental cages dimensions was (1 × 1.5 × 1) m and totally 24 cages were used for this experiment and in each experimental cage, 20 birds of both sexes were cast. In this project, 480 pieces of broiler chicks of both sexes of Ross were examined.

A few days before the start time, the room is completely cleaned with detergent and then was disinfected thoroughly. A few hours before the arriving chicks to hall, heater turned on until the temperature reaches to 32^0c degrees Centigrade. The chicks were randomly assigned to each of the experimental units. During the period, feed were freely on chickens available. In the first and second weeks of the nurturing, a feeding tray and conical water fountains were used in each experimental unit and from the beginning of the second week, feeding vessel were cylindrical. In whole period, feed intake by chicks was voluntary and chickens weight and feed consumption were taken at the end of each week. During the aviculture period with observing mortality, carcass weight immediately and mortality times were also recorded.

Diet based on Requirements of broiler chicks and with attention to nutrient content of food items for the three stages of development was formulated by the WUFFDA software. The initial phase (0 to 10 days old) growth phase (11 to 28 days) and late phase (29 to 45 days), were respectively.

Salinomycin from 7 days to 22 days and Maduramaysin from 22 days to 32 days were used.

Measured various factors in this experiment were, the amount of food intake, body weight gain, rate of feed conversion and mortality were from overweight.

Statistical model of pilot plan

In this experiment, a completely randomized design was used with the following model:

$$X_{ij} = \mu + t_j + \mu_{ij}$$

in This formula X_{ij} represents each observation in experience, μ represents the total mean, T_j effect of treatment, and μ_{ij} effects of experimental error. And for analysis of the different factors SPSS-18 software of computer was used.

Table 1 .rations used in various experiments

End period (kg per tone)	Growth period (kg per tone)	Initial period (kg per tone)	Meal materials
684	640	572	**Corn**
262	302	367	**Soy**
16	18	20	**Oil liquid**
5.13	15	15	**Dicalcium phosphate**
11	5.11	12	**Calcium carbonate**
2	2	5.2	**Salt**
1.5	1.5	2	**Baking soda**
2.5	3	3	**Mineral supplement**
2.5	3	3	**Vitamin supplement**
2.3	2	2	**Methionine**
2	1.5	1	**Lysine**
Nutrients			
3170	3080	2980	**Energy**
18	19	5.20	Protein
176	162	145	**ratio of energy to protein**
05.1	1.1	2.1	**Total lysine**
43.0	44.0	46.0	**Total Methionine**
82.0	84.0	89.0	**Methionine + cysteine**
9.0	96.0	1	**Calcium**
45.0	48.0	5.0	**P**
16.0	17.0	2.0	**Sodium**
2.0	2.0	2.0	**Cl**

RESULTS AND DISCUSSION

The weight gain in the initial period (0 to 10 days) and growth period (11 to 28 days) , treatment containing of water+ initial feed Crumble , water + initial feed Crumble+ electrolyte multivitamin , water + sugar + initial feed Crumble + electrolyte Multi vitamins, and water+ initial feed mesh + electrolyte multivitamin, significantly have higher performance than the treatments containing initial seed+ water + sugar and water + cornstarch + electrolytes multivitamins (P <0.05). Treatment containing water + initial grain crumble+ electrolyte multivitamin, showed the most weight gain on initial period between experimental treatments and water treat+ sugar+ initial feed Crumble had the lowest weight gain during the same period .

The weight gain in the finishing period (29 to 45 days) , water treatment Crumble + electrolyte multivitamin has significantly higher performance than treatment with water+ initial feed Crumble (p <0.05). There were no significant differences between the other treatments. Weight gain in whole of period of, water treatment +initiation grain Crumble + electrolyte multivitamin have showed highest yield among the treatments. The difference of this treatment with treatments containing water + initial feed Crumble , water + sugar + initial feed Crumble and water + cornstarch + electrolyte multivitamin was significant (P <0.05). But the difference between the treatments with water + sugar + initial feed Crumble + electrolyte multivitamin and water+ initial grain mesh +electrolyte multivitamin wasn't significant (P <0.05)

Table 2 - Comparison the averages of weight gain during the early period (0 to 10 days) in different treatments

Weight gain on initial period (0 to 10 days) g	Treatments of experience
a39.25±9.262	Water + sugar + initial feed Crumble
b29.25±6.241	Water + sugar + initial feed Crumble
a53.5±10.274	Water + initial feed Crumble+ electrolyte multivitamin
a45.5±6.262	Water + sugar+initial feed Crumble+ electrolyte multivitamin
b5.25±7.246	water +Corn flour + electrolyte multivitamin
a54.25±8.261	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences

Table 3 - Comparison the averages of weight gain of growing period (11 to 28 days) in different treatments

weight gain during growing period (11 to 28 days) g	Treatments of experince
a40.25±3.1160	Water + initial feed Crumble
b88.5±2.1072	Water + sugar + initial feed Crumble
a82.5±13.1180	Water + initial feed Crumble+ electrolyte multivitamin
a15.1150±51	Water + sugar + initial feed Crumble+ electrolyte multivitamin
b78.75±4.1103	water +Corn flour + electrolyte multivitamin
a24.75±34.1158	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences

Table 4 - Comparison averages of weight gain on final period (29 to 45 days) in different treatments

the final periods weight gain(29 to 45 days) g	treatments of Experiment
b56.75±5.1162	Water + initial feed Crumble
ab1195±10	Water + sugar + initial feed Crumble
a68.1305±103	Water + initial feed Crumble+ electrolyte multivitamin
ab5.75±102.1258	Water + sugar + initial feed Crumble+ electrolyte multivitamin
ab775.1225±	water +Corn flour + electrolyte multivitamin
ab86.1220±96	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences

Table 5 - Comparison the averages of weight gain in whole of period (0 to 45 days) in different treatments

weight gain of whole period (0 to 45 days) g	treatments of Experiment
bc37.25±10.2585	Water + initial feed Crumble
c53.75±8.2508	Water + sugar + initial feed Crumble
a75.2760±126	Water + initial feed Crumble+ electrolyte multivitamin
ab12.25±148.2671	Water + sugar+initial feed Crumble+ electrolyte multivitamin
bc9.2575±12	water +Corn flour + electrolyte multivitamin
abc20.2640±120	Water + initial feed mesh + electrolyte multivitamin

Dissimilar letters in each column indicate significant differences.

Feed consumption

The feed consumption in starter period (0 to 10 days), treatments such as water + initial grain crumble+ electrolyte multivitamin and water + initial feed mesh+ electrolyte multivitamin had the highest intake. The differences between treatments with treatments containing water + sugar + initial grain crumble and water + cornstarch + electrolyte multivitamin was significant (P <0.05), but this difference with treatments such as water + sugar+ initial grain crumble+ electrolyte multivitamin and water + initial grain crumble statistically was not significant (P <0.05).
In terms of feed consumption in growing period (11 to 28 days) , treated with water + sugar + initial feed Crumble significantly , compared with the other treatments had lower feed consumption (P <0.05). Among other treatments, no significant differences were observed.

In terms of feed consumption at the end period (29 to 45 days) , treated with water + sugar + initial feed Crumble and water + cornstarch + + initial feed Crumble + electrolyte multivitamin , had significantly , lower feed consumption than other treatments(P <0.05).

In terms of feed consumption at the whole period (0 to 45 days) , treatment of water + sugar + initial feed Crumble had the lowest food intake . The difference between the treatment of corn flour + water + multivitamin electrolyte wasn't significant but difference with other treatments was significant (P <0.05).

Table 6 - Comparison of Average feed intake during initial period (0 to 10 days) in different treatments

feed intake of initial period (0 to 10 days) g	treatments of Experiment
ab72.5±4.293	Water + initial feed Crumble
c08.280±4	Water + sugar + initial feed Crumble
a07.300±7	Water + initial feed Crumble+ electrolyte multivitamin
ab71.292±5	Water + sugar+initial feed Crumble+ electrolyte multivitamin
bc08.25±11.286	water +corn flour + electrolyte multivitamin
a128.300±9	Water + initial feed mesh + electrolyte multivitamin

Dissimilar letters in each column indicates significant differences

Table 7 - Comparison the means of feeding on growth period (11 to 28 days) in different treatments

Feed on growing period(11 to 28 days)g	treatments of Experiment
5.31a25±.1942	Water + initial feed Crumble
b93.25±14.1836	Water + sugar + initial feed Crumble
a36.25±14.1921	Water + initial feed Crumble+ electrolyte multivitamin
a01.5±89.1965	Water + sugar + initial feed Crumble+ electrolyte multivitamin
a41.1955±20	water +corn flour + electrolyte multivitamin
a07.1940±7	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

Table 8 - Comparison the means of feed intake in final period (29 to 45 days) in the different treatments

Feed on final period(29to45 days)g	treatments of Experiment
a39.25±6.3339	Water + initial feed Crumble
b08.3200±4	Water + sugar + initial feed Crumble
a45.3420±58	Water + initial feed Crumble+ electrolyte multivitamin
a23.25±151.3391	Water + sugar + initial feed Crumble+ electrolyte multivitamin
b78.75±4.3193	water +corn flour + electrolyte multivitamin
a73.5±48.3382	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

Table 9 - Comparison the averages of feed intake in whole period (0 to 45 days) in different treatments

Feed on final period(0to45 days)g	treatments of Experiment
ab13.5575±10	Water + initial feed Crumble
c5.25±12.5316	Water + sugar + initial feed Crumble
a67.25±47.5641	Water + initial feed Crumble+ electrolyte multivitamin
a5.75±242.5648	Water + sugar + initial feed Crumble+ electrolyte multivitamin
bc45.5435±26	water +corn flour + electrolyte multivitamin
a88.5 ±51.5622	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

FCR

The conversion ratio in the initial period (0 to 10 days), treatment with water + sugar + initial grain Crumble with conversion ratio 1/161 has the highest conversion rate. This amount with FCR of water+ initial grain Crumble + electrolytes multivitamin with conversion ratio 1.093, which has the lowest conversion factor, showed a significant difference (P <0.05) but differences with other treatments isn't significant (P <0.05).

The conversion factor of the growing period (11 to 28 days) , treatment of water + initial feed Crumble + electrolyte multivitamin significantly showed the lowest FCR (P <0.05). Treatment of water+ corn flour + electrolyte multivitamin during this period had highest FCR, and statistically significant difference with other treatments (P <0.05). The conversion factor in the final period (29 to 45 days) and whole period (0 to 45 days) , treatment of water + initial feed Crumble had the most conversion ratio between different experimental groups . Its Difference with treatments containing water + sugar + initial feed Crumble+ electrolyte multivitamin and water + sugar + initial feed mesh + electrolyte multivitamin isn't statistically significant. , but this difference was significant with other treatments (P <0.05).

Table 10 - Comparison the means of FCR during initial period (0 to 10 days) in different treatments

FCR on initial period(0 to 10 days)	treatments of Experiment
ab027.1199±0.1	Water + initial feed Crumble
a034.1612±0.1	Water + sugar + initial feed Crumble
b043.0939±0.1	Water + initial feed Crumble+ electrolyte multivitamin
ab034.1129±0.1	Water + sugar + initial feed Crumble+ electrolyte multivitamin
a04.1629±0.1	water +Cornflour + electrolyte multivitamin
ab025.1486±0.1	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences are

Table 11 - Comparison the means of conversion ratio in growth period (11 to 28 days) in different treatments

FCR of growth period(11 to28days)	treatments of Experiment
b0069.674±0.1	Water + initial feed Crumble
b011.7121±0.1	Water + sugar + initial feed Crumble
c03.6277±0.1	Water + initial feed Crumble+ electrolyte multivitamin
b012.7091±0.1	Water + sugar + initial feed Crumble+ electrolyte multivitamin
a015.7712±0.1	water +corn flour + electrolyte multivitamin
b0566.6755 ±0.1	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

Table 12 - Comparison the mean of FCR in final period (29 to 45 days) in different treatments

FCR of final period (29 to 45 days)	treatments of Experiment
a0099.8719±0.2	Water + initial feed Crumble
b025.678±0.2	Water + sugar + initial feed Crumble
b179.6314±0.2	Water + initial feed Crumble+ electrolyte multivitamin
ab119.7008±0.2	Water + sugar + initial feed Crumble+ electrolyte multivitamin
b011.6072±0.2	water +corn flour + electrolyte multivitamin
ab172.7828±0.2	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

Table 13 - Comparison the averages of conversion ratio in whole period (0 to 45 days) in different treatments

Conversion ratio of whole period(0to45 days)	treatments of Experiment
a0099.1565±0.2	Water + initial feed Crumble
ab025.1191±0.2	Water + sugar + initial feed Crumble
b179.0467±0.2	Water + initial feed Crumble+ electrolyte multivitamin
ab119.1158±0.2	Water + sugar + initial feed Crumble+ electrolyte multivitamin
ab011.1107±0.2	water +corn flour + electrolyte multivitamin
a172.1323±0.2	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

Carcass

The carcass yield, percentage of mortality, percentage of abdominal fat, relative percentage of breast, relative percentage of liver, relative percentage of gizzard, between different treatments, there were no significant differences (05/0P <).

Table 14 - Comparison the averages of carcass yield in different treatments

Carcass yield	treatments of Experiment
a22.07±0.77	Water + initial feed Crumble
a26.87±0.77	Water + sugar + initial feed Crumble
a47.62±0.77	Water + initial feed Crumble+ electrolyte multivitamin
a36.65±0.77	Water + sugar + initial feed Crumble+ electrolyte multivitamin
a411.47±0.77	water +corn flour + electrolyte multivitamin
a378.75 ±0.77	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

Table 15 - Comparison the means of mortality rates in various treatments

Mortality percentage	treatments of Experiment
a025.25±0.1	Water + initial feed Crumble
a025.25±0.1	Water + sugar + initial feed Crumble
a025.25±0.1	Water + initial feed Crumble+ electrolyte multivitamin
a025.25±0.1	Water + sugar + initial feed Crumble+ electrolyte multivitamin
a028.5±0.2	water +corn flour + electrolyte multivitamin
a0	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

Table 16 - Comparison the averages of fat percentage of abdominal in different treatments

Abdominal fat percentage	treatments of Experiment
a012.6975±0.3	Water + initial feed Crumble
a017.6975±0.3	Water + sugar + initial feed Crumble
a027.71±0.3	Water + initial feed Crumble+ electrolyte multivitamin
a043.7±0.3	Water + sugar + initial feed Crumble+ electrolyte multivitamin
a12.675±0.3	water +corn flour + electrolyte multivitamin
a018.71 ±0.3	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

Table 17 - Comparison the means of relative percentage in different treatments

Breast relative percentage	treatments of Experiment
a19.85±0.31	Water + initial feed Crumble
a58.95±0.31	Water + sugar + initial feed Crumble
a7.95±0.31	Water + initial feed Crumble+ electrolyte multivitamin
a432.4±0.31	Water + sugar + initial feed Crumble+ electrolyte multivitamin
a221.725±0.31	water +cornflower + electrolyte multivitamin
a341.65 ±0.31	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

Table 18 - Comparison the means of liver relative percentage in different treatments

liver relative percentage	treatments of Experiment
a033.7925±0.2	Water + initial feed Crumble
a112.6975±0.2	Water + sugar + initial feed Crumble
a057.77±0.2	Water + initial feed Crumble+ electrolyte multivitamin
a049.7425±0.2	Water + sugar + initial feed Crumble+ electrolyte multivitamin
a07.75±0.2	water +corn flour + electrolyte multivitamin
a095.725 ±0.2	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

Table 19 – comparison the means of hip Relative percentage in different percentage

Hip relative percentage	treatments of Experiment
a11.9±0.27	Water + initial feed Crumble
a37.825±0.27	Water + sugar + initial feed Crumble
a57.8±0.27	Water + initial feed Crumble+ electrolyte multivitamin
a43.875±0.27	Water + sugar + initial feed Crumble+ electrolyte multivitamin
a62.825±0.27	water +cornflower + electrolyte multivitamin
a404.05±0.28	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant difference

Table 20 - Comparison the mean of gizzard relative percentage in different treatments

gizzard relative percentage	treatments of Experiment
a02.15±0.1	Water + initial feed Crumble
a04.1525±0.1	Water + sugar + initial feed Crumble
a07.1925±0.1	Water + initial feed Crumble+ electrolyte multivitamin
a037.1475±0.1	Water + sugar + initial feed Crumble+ electrolyte multivitamin
a012.1175±0.1	water +Corn flour + electrolyte multivitamin
a04.1525 ±0.1	electrolyte multivitamin+ Water + initial feed mesh

Dissimilar letters in each column indicate significant differences.

treatment containing water + initial feed Crumble + electrolyte multivitamin have showed, the largest initial weight gain among experimental treatments and initial period and water treatment+ sugar+ initial grain crumble , had the lowest weight gain during the same period . The results showed that in prime and final period, use of whole grain in form of crumble with water and electrolyte multivitamin had the best performance in case of weight gain and use of sugar at water didn't have positive yield. Researchers have suggested that starting Dietary intake of initial time of feeding in, an increase feed intake and body weight respectively [5].

From the view of weight gain in whole period, water treatment +initiation crumble + electrolyte multivitamin showed the highest yield among the treatments. This shows that best performance can be get in terms of weight gain, with using a whole grain in Crumble form with water and electrolyte multivitamin, immediately after arrive of chicks to aviculture room.
In one experiment, the chicks in first 48 hours, received a variety of diets. Chicks that in early 48 hours used initial whole grain with 23% protein significantly had greater weight gain [6]. These results are consistent with the results of this experiment.

The researchers argue that chicks instinctively after leaving the eggs are foraging and their growth begins start about 24 hours after eating. In most cases the chickens for 36 to 48 hours after leaving the eggs do not have access to food. As a result, during this period, the body weight due to losing fluid decreases [7].

Chicks in the last weeks of rearing will have compensatory growth and compensate their weight loss. Poor early nutrition in the first week usually has negative affect on growth of muscles.

Unavailability of food reduces the growth of skeletal muscles and birds may be forced to compensate for the loss later [8].

Generally digestive enzymes are in the body of poultry. Therefore the food that enter into poultry digestive tract , will digest well but the nutrients do not absorbed until birds start to eat initial feed. Existence of food in digestive channel is a factor that cause stimulates and absorption of nutrients [9].

When the chicks hatch out, are poor in sense of carbons. Initial power effectively increases rapidly the liver glycogen. Existence some dietary carbohydrates such as glucose and sucrose, increased storing liver glycogen. So if a chick starter diet containing 60 percent carbohydrates along with other nutrients required by chicks, liver glycogen level storing will increase [4].
The theory that chickens should be kept without food for some time after hatching is unacceptable. experiments has proven that weight in 6 or 7 weeks directly related to its weight in the first week of aviculture and this relationship is apart from relation between the chicks initial weight and age of chickens[3]

Results showed that protein deficiency in early ages of growth period leads to tissue hyperplasia; use of propionate has decreased initial casualties in whole period of propionate consumption. And standard basal diet improved process of weight gain [10].

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