INFLUENCE OF FASTING AND EARLY FEEDING BY USING HYDRO-GEL 95 AFTER HATCHING ON THE VILLI OF INTESTINE (DUODENUM) OF BROILER ROSS 308

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Abstract

Influential the optimal time of fasting and early feeding for broiler is a significance to advance successive productive performance. The determination of this study is to assess the influence of fasting and early feeding by using Hydro-Gel 95 after hatching on the growth parameters of broiler chicks. This research is design by using a completely randomized design (CRD) with total of 240 broilers (Ross 308) one-day-old spread to 4 groups as follow: 1-The first group is a control (T₁) feeding a starter diet after hatching (no supplementation with Hydro - Gel 95). 2- The second group (T₂) feeding (Hydro - Gel 95) after hatching for two hours only, after that feeding a starter diet. 3-The third group (T₃) feeding (Hydro- Gel 95) after hatching for four hours and then feeding a starter diet. 4-The four group (T₄) feeding (Hydro-Gel 95) after hatching for six hours and then feeding a starter diet. The effects of the present experiment revealed that feeding chicks with Hydro - Gel 95 had a significant (P<0.05) improvement for (T₃) as a Histological change were appearance different the villi in shape and length compare to control group and other group showing more length. While group (T₄) had shown more length but destruction in mucosa, and lamina properia. The results suggest that feeding (Hydro-Gel 95) to chicks after hatching for 4 or 6 hours could improve Histological of villi which due to improve the growth parameters of broiler chickens.

Key words: Fasting, Early Feeding, Hydro-Gel 95.

Introduction

Supply water and feeding directly after hatch has been shown to be significant reason through the first days after hatching, since they are single vital factors to stretch the objective weight. It recognized that the progression of hatching in commercial hatcheries prolonging approximately 24 - 48 hours 'til totally chicks are hatched, the chicks stay in the hatch machines lacking of feeding and water as an effect. Furthermore, the procedure of immunization and stuffing in the birdcages and transmission chicks to the assembly fields lead to late feeding and water for more than 24-48 hours. This postponement coverage the chicks to tension of malnutrition and tissues dryness, which affect the regular growing of chicks (Batal and Parsons , 2002 ; Tweed , 2005 ). Therefore, companies have urbanized new nutritive schemes for chicks while they are still in the hatching machines. This scheme is called early feeding which offer necessary nutrients (energy, vitamins, and minerals) that have a important character in accumulative intestinal action which in opportunity revealed on chicks health (Griffiths et al., 1977 ; Fayyad and et al., 2010 ; Prabakar et al., 2015). Some systems of chicks early feeding have been used, like spraying nutrients with bits on chicks or as Pellet or mixing the nutrients mandatory with gel to become a paste and twig it on the places of the cages (Naji et al., 2009). The "Hydro-Gel 95" covers around 95% water with nutrients which are individually prepared for poultry chicks to upsurge the capability to overwhelmed the tension in hatcheries or in transference from hatchery to the farm. For that purpose, the current revision objectives
Influence of Fasting and Early Feeding by Using Hydro-Gel 95 after Hatching on the villi of intestine

Materials and Methods
This experimentation was conducted in the poultry farm, department of Animal Production, faculty of agriculture, University of Kufa, for the period of 5 weeks (from 15 January 2018 to 18 February 2018). This experiment is design by using a completely randomized design (CRD) with total of 240 broiler chicks of Ross 308 one day old were used in this experiment, which collected from Al-Anwar Hatchery private company in Babylon, with a prime weight about 42 g. The chicks were arbitrarily spread after they left the hatching machine to 4 cages (counting each cage as treatment) with 60 chicks / Cage, and each cage divided to 3 parts (each replicate contents 20 birds), as follow:

1. The first group (T₁) was a control group which was given a starter diet immediately after hatching.
2. The second group (T₂) was given (Hydro - Gel 95) after hatching immediately for two hours only, followed by a starter diet.
3. The third group (T₃) was given (Hydro- Gel 95) after hatching immediately for four hours only, followed by a starter diet.
4. The four group (T₄) was given (Hydro-Gel 95) after hatching immediately for six hours only, followed by a starter diet.

The Hydro - Gel 95 Produced in USA, provided from the official agent of the company in Saudi Arabia, Every 100 grams of Hydro-Gel 95 Contains: 25.6 Kcal ME, 0.3 g crude protein, 2.2 g carbohydrate, 0.4 g sugar, 1.6 g crude fiber, 1.9 g fat, 95% water, 1.5 mg calcium, 0.2 mg phosphorus, 54.5 mg potassium, 26.1 mg Sodium.

The chicks were distributed to 12 Pens (200 × 150 cm per pen) after their arrival to the farm. Pellet foods were used in this experiment provided from Middle Euphrates for poultry food in Najaf. Chicks were held on floor cages and artificial lighting was provided for 23 hours daily for 5 weeks of experimental period. All chicks were fed during the first three weeks of age (1-21 Days) on starter diet (22.89% crude protein and 2958.80 Kcal ME / kg). Then finisher diet (19.12 % crude protein and 3117.25 Kcal ME / kg) (Table, 1) was used during the second phase of age (22 - 35 Days). Vitamins and minerals mixture were added to cover the dietary necessities of chicks in accord with the Ross 308 broiler management guide.

One kilogram of premix contained: 2200 Kcal/kg Metabolizable Energy, 45% crude Protein, 8% crude Fat , 3% crude Fiber, 6% calcium , 0.12% Phosphorus (av), 3% Lysine, 2% methionine, 2.5% methionine + Cystine, 130,000 IU vitamin A, 30,000 IU vitamin D3, 500 mg vitamin E, 40 mg vitamin K, 30 mg vitamin B1, 75 mg vitamin B2, 60 mg vitamin B6, 120 mg pantothenic acid, 15 mg folic acid, 400 mg niacin, 1,500 mg biotin, 1.7% choline, 1.5 % Na , 450 mg Fe (ferrous sulfate), 70% Cu (copper sulfate), 600 mg Zn(zinc sulfate), 5 mg I (potassium iodine), 1 mg cobalt, and 1 mg Selenium.

Table 1: Composition of the basal diets %.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
<th>Diets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow Corn</td>
<td>40</td>
<td>39.45</td>
</tr>
<tr>
<td>Wheat</td>
<td>20.5</td>
<td>29.6</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>2.95</td>
<td>3.35</td>
</tr>
<tr>
<td>Soybean meal (48%)</td>
<td>31.3</td>
<td>21</td>
</tr>
<tr>
<td>Premix</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Limestone</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Salt</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Dicalcium Phosphate</td>
<td>1.15</td>
<td>1.2</td>
</tr>
<tr>
<td>Vegetable oil</td>
<td>0.7</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Calculated nutrient levels % (N.R.C. 1994).
Crude protein % 22.89 19.12
Energy ( Kcal ME / kg ) 2958.80 3117.25
Crude Fat % 2.62 3.96
Crude Fiber % 3.97 3.83
Calcium % 1.00 0.82
Available phosphorus % 0.52 0.39
Methionine % 0.52 0.46
Lysine % 2.35 1.91
Cysteine % 0.44 0.09
Vitamin A ( IU / kg feed) 12000 10000
Vitamin D₃ (IU / kg / feed) 5000 4000
Vitamin B₁₂ (Mg / kg feed) 8.60 3.00
Vitamin B₁₂ ( Microgram / kg feed) 17.00 10.00
Vitamin E ( IU / kg / feed) 6.00 40.00
Vitamin K3 (Mg / kg feed) 3.20 2.00
Energy / protein Ratio 129.26 163.05

One kilogram of premix contained: 2200 Kcal/kg Metabolizable Energy, 45% crude Protein, 8% crude Fat , 3% crude Fiber, 6% calcium , 0.12% Phosphorus (av), 3% Lysine, 2% methionine, 2.5% methionine + Cystine, 130.000 IU vitamin A, 30.000 IU vitamin D3, 500 mg vitamin E, 40 mg vitamin K, 30 mg vitamin B1, 75 mg vitamin B2, 60 mg vitamin B6,120 mg pantothenic acid, 15 mg folic acid, 400 mg niacin, 1,500 mg biotin, 1.7% choline, 1.5 % Na , 450 mg Fe (ferrous sulfate), 70% Cu (copper sulfate),
600 mg Zn (zinc sulfate), 5 mg I (potassium iodine), 1 mg cobalt, and 1 mg Selenium.

Diets and water were offered ad libitum over the experimental period. Chicks in all four groups of experiment were kept under the same management system. Diets were formulated according to (N.R.C., 1994). Preparation of Biopsy by Dehydration used ethanol in different concentration to remove the water from the tissue (30 %, 70 %, 80 %, 90 %, 100 %) for 1-1.5 hours to each concentration. Embedded the tissue into paraffin wax used wax machine fill the cassette and then place in +4 C until the wax is harden. The wax block place in microtome and begin cutting at 3-4 mm as optimal thickness and the section pick up by forceps into the water bath in 45-50 C. For reless the fold, then take the floating section by clean slide and putting in oven at 40 C to remove a access wax. Clearing the slide by used xelen with embedded in 3 beaker for 2 minutes in ethanol with different concentration % (100, 90, 80, 70, 30) for 15 minute in each concentration and rinse in distilled water for 5 minute. Hematoxylin and eosin dye used for stain the slid, by place at first in Hematoxylin for 10 minute, wash by tap water and used eosin for 15 minute, wash by xelen for 5 minute to remove excesses stain. Addition Canada balsam and cover slid, the slid now ready to examine under light microscope (mag. X 40).

Data achieved from the experiment were tested for significance by one-way ANOVA using the GLM procedures of SAS (2012). Differences among treatment means were separated by Duncan’s multiple range test (Steel and Torrie, 1980).

Results & Discussion

Early Feeding help to improve overall performance of the bird including intestinal development, stimulation of immune system, it is important to select a specialized supplement that can improve the development of the intestine, if the intestine tract develop more efficiently, the bird will be better able to absorb nutrients which can impact Feed efficiency and muscle development in the long run (Prabaker et al., 2015).

Noy et al., (1999, 2001) refer there were increase in intestine weight in chicks which early feed. In this experiment appeared that increasing in mass weight of intestine due to the increase in the size of villa will lead to increase the absorption the nutrient and increase in body weight.
Fig. (T1) = The chicken was given (Hydro-Gel 95) for 6 Hour immediate after hatching, show the villi is very long (A), mucosa Some distraction (B), lamina properia thin and long(C), serosa and sub mucosa normal (D).

The experiment appear the best time were given to the chicken is 4 Hours excess immediately after hatching, the groups were given in this time get more weight than other groups (2,4) because the villa show is larger in size and long will lead to increase the absorption surface and weight production (Fig. 3).

Groups 4 were given for 6 Hours with (Hydro-Gel 95) immediately after hatching not get increase in weight production although the villa is more long than other groups (Fig. 4), because the length of villa more than normal lead to destruction some of epithelial cell in mucose membrane which causes decrease the absorption surface and not get weight production compare with other groups (2, 3).

References


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