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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 (T_1) feeding a starter diet after hatching (no supplementation with Hydro - Gel 95). 2- The second group (T_2) feeding (Hydro - Gel 95) after hatching for two hours only, after that feeding a starter diet. 3-The third group (T_3) feeding (Hydro- Gel 95) after hatching for four hours and then feeding a starter diet. 4-The four group (T_4) 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 (T_3) 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 (T_4) 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 a 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

to govern the influence of early feeding by Hydro - Gel 95 and define the greatest period of early feeding on the villi of intestine (Duodenum) in broiler chicks.

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 (T_1) was a control group which was given a starter diet immediately after hatching.
2. The second group (T_2) was given (Hydro - Gel 95) after hatching immediately for two hours only, followed by a starter diet.
3. The third group (T_3) was given (Hydro- Gel 95) after hatching immediately for four hours only, followed by a starter diet.
4. The four group (T_4) 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.

Table 1: Composition of the basal diets %.

Ingredient %	Diets	
	Starter	Finisher
Yellow Corn	40	39.45
Wheat	20.5	29.6
Wheat bran	2.95	3.35
Soybean meal (48%)	31.3	21
Premix[1]	2.5	2.5
Limestone	0.7	0.7
Salt	0.2	0.2
Dicalcium Phosphate	1.15	1.2
Vegetable oil	0.7	2
Total	100	100
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 D_3 (IU / kg / feed)	5000	4000
Vitamin B_2 (Mg / kg feed)	8.60	3.00
Vitamin B_{12} (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

[1]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, 1500 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.

[1]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, 1500 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 xylen 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 xylen 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

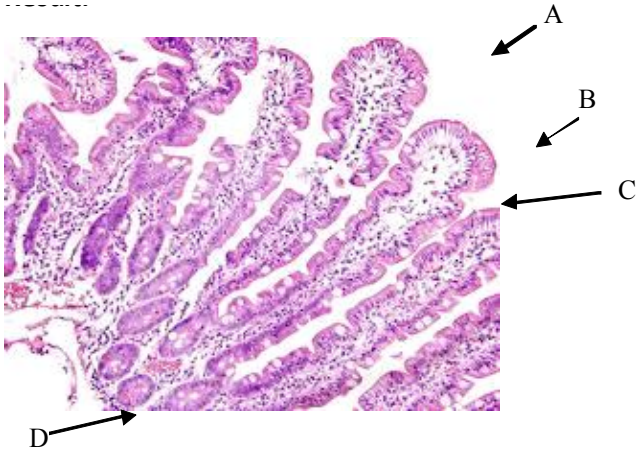

Fig. (T_1) = Control group which were the chicken given starter pellet diet immediately after hatching , show the normal length villi (A) , mucosa normal (B), lamina properia normal (C),sub mucosa normal (D).

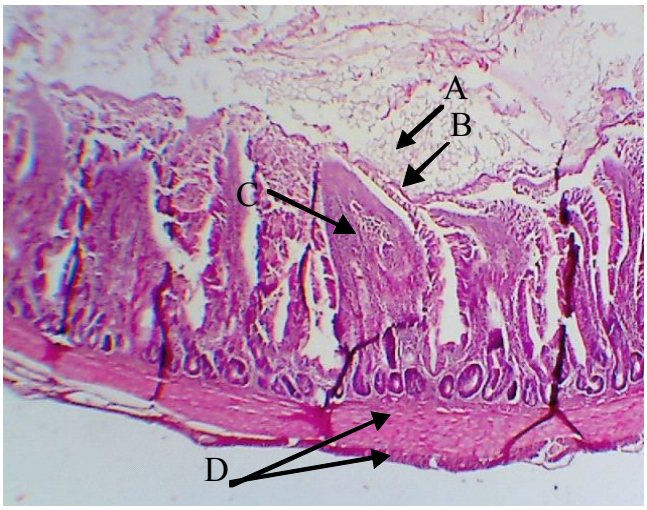

Fig. (T_2)= The group of the chicken were given 2 Houers (Hydro-Gel 95) immediately after hatching ,show the villi is short (A),Mucosa normal (B), Lamina properia metaplasia(C), sub mucosa and serosa normal(D).

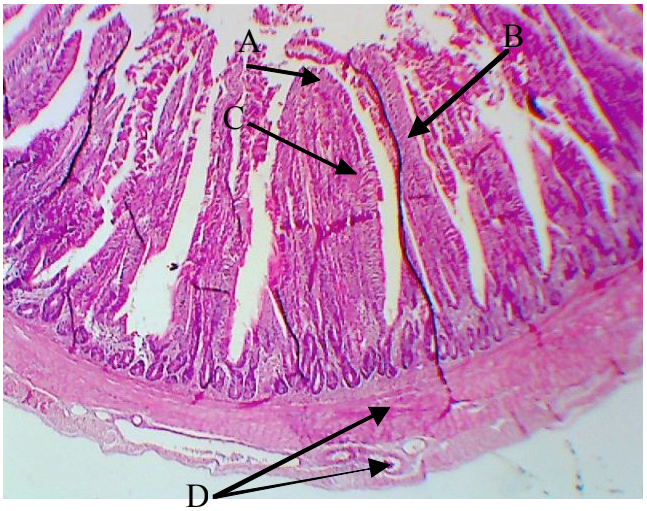

Fig. (T_3) =The chicken was given (hydro-Gel 95) for 4 Hours immediately after hatching ,the villi show large in size and long (A), mucosa normal (B), lamina prpreria metaplasia (C), sub mucosa and serosa normal (D).

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.

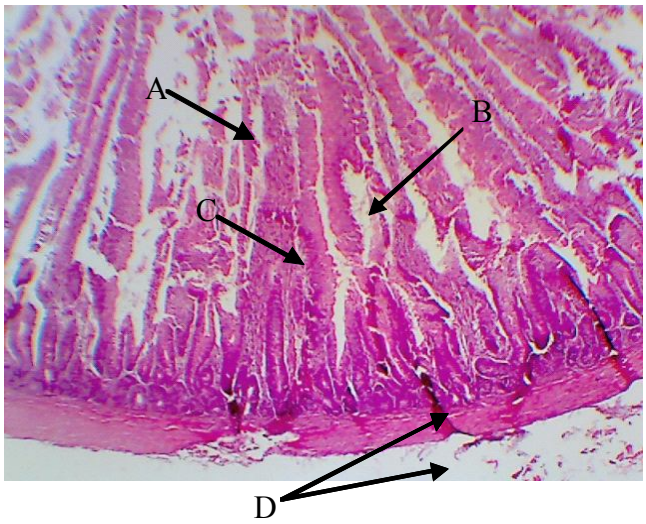

Fig. (T_4) = The chicken was given (Hydro-Gel 95) for 6 Hour immediate after hatching, show the villi is very long (A), mucosa Some distraction (B), lamina properia thin and long(C), serosa and sub mucosa normal (D).

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

Al- Diri, A. (2011). The effect of early feeding methods after hatching on performance and immunity in broilers. M.Sc. Thesis. Faculty of Vet. Med. University of Albaath, Syrian Arab Republic.

Ani, Z. and P. Ferket (2004). Met Methods for early nutrition and their potential. *World's Poult. Sci. J.*, **60:** 101-111.

Bar Shira, E., D. Sklan and A. Friedman (2005). Impaired immune response in broiler hatchling hindgut following delayed access to feed. *Vet. Immunol. Immunolpathol.*, **105:** 33-45.

Batal, A. and C. Parsons (2002). Effect of fasting versus feeding oasis after hatching on nutrient utilization in chicks. *Poult. Sci.*, **81:** 853-859.

Dibner, J.J., C.D. Knight, M.L. Katchell, C.A. Atwell, A.C. Downs and F.J. Ivey (1998). Early Feeding and development of immune system in Neonatal poultry. *J. Appl. Poultry. Res.*, **7:** 425-436.

El-Husseiny, O., S. Abou-Elwafa and H. El- Komy (2008). Influence of fasting or early feeding on broiler performance. *Int. J. Poult. Sci.*, **7:** 263-271.

Fayyad, H., S. Naji and N. Abdul-Hajo (2011). Technology of egg production and its products. Page 9-10, Book Academic Press, Faculty of Agriculture, University of Baghdad. Baghdad. Iraq.

Griffiths, L., S. Leeson and J. Summers (1977). 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.

Henderson, S., N. Vicent, C.M. Pixicy, B.M. Hargi and G. Telle7 (2008). Effect of early Nutritional supplement on broiler performance. *Int. J. Poultry Sci.*, **7:** 211-214.

Juul-Madsen, H., G. Su and P. Sorensen (2004). Influence of early or late start of first feeding on growth & immune phenotype of broilers. *Brit. Poult. Sci.*, **45:** 210-222.

Naji, S., G. Al-Qaisi, Z. Al-Danki, A. Al-Hilali and Y. Jamil. Hatching and management of hatcheries. Page 34-36, Book Nasser Press, Iraqi Poultry Producers union, Baghdad. Iraq.

Noy, Y. and D. Sklan (1999). Different type of early Feeding and performance in chicks and poults. *J. Appl. Poult. Res.*, **8:** 16-24.

Noy, Y., A. Geyra and D. Sklan (2001). The Effect of early Feeding on growth and small intestine development in the post hatch. *Poult. Sci.*, **80:** 912-919.

NRC (1994). Nutrient Requirements of Poultry. 9th rev. ed. Natl.Acad. Press, Washington, DC.

Panda, A. and M. Reddy (2007). Boosting the chicks' immune system through early chick nutrition. *Poult. Int.*, **47:** 22-26.

Plavnik, I. and S. hurwits (1985). The performance of broiler chickens during and following a server feet Restrictional on early age. *Poultry Sci.*, **64:** 348-355.

Plavnik, I. and S. Hurwits (1991). Response of broiler chickens and Turkey pouts to food restriction of varied severity during early life. *Brit. Poultry Sci.*, **32:** 343-352.

PLavnik, I. and Z.S. Hurwit (1988). Early feed restriction in male Turkeys. growth patern, feed efficiency and body composition. *Poultry Sci.*, **67:** 1407-1413.

Pourteza, J., F. Zamani, A. Tabeidian and M.Toghyani (2012). Effect of early feeding or feed deprivation on growth performance of broiler chicks. *Res. pin. Anim.Vet. Sci.*, **2(2):** 136-140.

Prabakar , G., M. Moorthy, K. Mani and B. Mohan (2015). Performance of broilers fed with glucose, egg powder and whey powder during juvenile period. *Ind. Vet. J.*, **93:** 23-26.

Prabakar, G., S. Pavulraj , S. Shanmuganathan, A. Kirubakaran

and N. Mohana (2016). Early Nutrition and Its Importance in Poultry: A Review. *Indian J. Anim. Nutr.*, **33(3):** 245-252.

SAS (2012). SAS / Stat User å s Guide : Statistics Cary.SAS Institute Inc. NC, USA .

Sklan, D. (2001) Development of digestive tract of poultry world. *Poult. Sci*., **57:** 415-428.

Steel, R.C. and J.H. Torrie (1980). Principle and procedures of Statistics, 2nd ed.McGraw-Hill Book Co. New York, NY.

Sumaidaie, S.M. (2010). Predicting the production performance of broiler Ross 308. Depending on the length or weight of the chick perforator. M.Sc. Thesis, Faculty of Agriculture University of Baghdad. Baghdad. Iraq.

Tsiaghe, V.K., M.E. Cook, A.E. Harpar and M.L. Sunde (1987). Enhanced immune vespones in broiler chicks Feed methionine in supplemented diets. *Poult. Sci*., **66:** 1147.

Tweed, S. (2005). The Hatch Window. Cobb- Vantress Technical Focus. Vol. 2. Siloam Springs, AR. 2nd ed.McGraw -Hill Book Co. New York, NY.

Turro, I., E.A. Dunnington, Z. Nitsan, M. Picard and P.B. Sieegel (1994). Effect of youlk-sac removalat hatchon growth and feeding behavior in lines of chickens differing in body weight. *Geowth. Dev. Aging*, **58:** 105-112.

Uni, Z., S. Ganot and D. Sklan (1998). Post hatch development of mucosal function in the broiler small intestine. *Poult. Sci.*, **77:** 75-82.

Zangana, B. and M. Jassim (2014). Effect of early feeding with bio-concentrates in meat carcass measurements. *J. Iraqi Agr. Sci.*, **45(4):** 409-414.