



P-ISSN: 2349-8528
 E-ISSN: 2321-4902
 IJCS 2018; 6(2): 3705-3707
 © 2018 IJCS
 Received: 01-01-2018
 Accepted: 02-02-2018

Kanagaraju P

Assistant Professor, Department of Poultry Science, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University, Vepery, Chennai, Tamil Nadu, India

Babu M

Director (Retired), Centre for Animal Production Studies, TANUVAS, MMC, Chennai, Tamil Nadu, India

Ramesh S

Professor and Head, Central Instrumentation Laboratory, MVC, Chennai, Tamil Nadu, India

Rathnapraba S

Assistant Professor, Department of Animal Biotechnology, MVC, Chennai, Tamil Nadu, India

Yadav Sunil Machindra

PG Scholar, Department of Poultry Science, Madras Veterinary College, Chennai, Tamil Nadu, India

Correspondence

Kanagaraju P

Assistant Professor, Department of Poultry Science, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University, Vepery, Chennai, Tamil Nadu, India

Effect of early post-hatch feeding on the production performance of commercial broiler chicken

Kanagaraju P, Babu M, Ramesh S, Rathnapraba S and Yadav Sunil Machindra

Abstract

A biological experiment was carried out to study the effect of early chick nutritional supplements (ECNS) with 600 day old straight run broiler chicks from a single hatch, individually weighed, wing banded and randomly allotted into five treatments with four replicates of 30 chicks each. One of the following early chick nutritional supplement viz., Control (No ECNS, T₁), Egg white protein-glucose based ECNS (EWPG, T₂), Corn-soybean and fish meal based ECNS without steaming (CSF WOS, T₃), Steamed corn-soyabean and fish meal based ECNS (CSF WS, T₄), Commercial broiler pre-starter diet as ECNS (CBPSD, T₅) was offered to each one of the treatment chicks immediately after hatch in the hatcher tray and continued till placing the chicks in the chick transport box except control (T₁) which was subjected to fasting for 24 hours to simulate field conditions. The data on hatch weight, chick transit weight loss, early chick mortality, day old to six week body weight and weight gain, feed consumption and feed conversion ratio at biweekly interval and livability were recorded and analyzed. The results of the study revealed that the ECNS feeding had significantly (P<0.01) improved sixth week body weight and weight gain than the birds reared on the control diet. The biweekly cumulative feed consumption and feed conversion ratio (FCR) up to six weeks of age were not significantly affected between the treatments. ECNS feeding improved the productive performance and livability in broilers.

Keywords: Early post hatch feeding, performance, feed conversion ratio, ECNS, broilers

Introduction

In fast growing commercial strains of broiler chicken the first seven days represents approximately 17 per cent of the growing period. The broiler chicks are held at hatchery without feed for 24-36 hours in order to complete hatchery operations like vaccination, packing and transport. Hence, the broilers spent 5-7 per cent of its life without any feed and water due to a wide "hatching window". During the transit time (hatchery to farm), chicks body weight decrease by 4 g per 24 h due to dehydration and yolk and pectoralis muscle utilization (Bhanja *et al.*, 2009) [1]. Delay in access to feed and water thus increases the weight loss (Bhanja *et al.*, 2009) [1], makes the hatchlings more susceptible to pathogens (Dibner *et al.*, 1996) [2] and restriction in the development of critical tissues (Halevy *et al.*, 2000) [3]. A good start leads to a uniform flock of chicks with a good 7th day weight which is positively correlated to the slaughter weight of the birds (Noy *et al.*, 2001) [4].

Early chick feeding has an overall, long-term beneficial effects in broilers as it reduces transit weight loss, minimizes slow starters, eliminate ketosis, improves appetite, increases average daily gain, growth performance, enhances immunity, improves livability thereby reduces mortality, decreases carcass condemnations, improves dressed weight and breast meat yield in broilers (Panda *et al.*, 2013) [5]. Rapid growth of broiler chicken within a shorter period has provoked the interest of poultry nutritionists in early chick nutrition during the perinatal period. Keeping the above factors in mind a nutritional study was conducted to develop suitable early chick nutritional supplement and study its effect on the growth performance and gut health.

Material and methods

A total of 600 day old straight run broiler chicks from a single hatch, individually weighed, wing banded and randomly allotted into five treatments with four replicates of 30 chicks each.

One of the following early chick nutritional supplement viz., Control (No ECNS, T₁), Egg white protein-glucose based ECNS (EWPG, T₂), Corn-soybean and fish meal based ECNS without steaming (CSF WOS, T₃), Steamed corn-soybean and fish meal based ECNS (CSF WS, T₄), Commercial broiler pre-starter diet as ECNS (CBPSD, T₅) was offered to each one of the treatment chicks immediately after hatch in the hatcher tray and continued till placing the chicks in the chick transport box except control (T₁) which was subjected to fasting for 24 hours to simulate field conditions. After reaching the farm the birds were fed with pre starter, starter and finisher mash as per BIS (2007) [6] from 0-7 d, 8-21 d and 22-42 d of age, respectively.

Data on hatch weight, transit weight loss, body weight, weight gain, feed consumption, FCR, liver glycogen and histomorphometry of the small intestine were recorded. The body weight of the broiler chickens were recorded at hatch, at farm after transportation, at biweekly interval by using an electronic balance with 0.2 g accuracy. The broiler chickens were fed *ad libitum* feed during the experimental period. Feed consumption up to the six weeks of age was recorded. Feed conversion ratio was calculated by dividing average feed consumption by average body weight gain.

Data recorded in the biological experiments were subjected to one way analysis of variance (ANOVA). The statistical analyses were carried out with the Statistical Package for

Social Science (SPSS, 1999) [7] for windows version 17; SPSS GmbH, Munich, Germany) to determine analysis of variance between groups. Means were compared by Duncan multiple range comparison test with level of significance (P<0.05).

All the experimental procedures were assessed and approved by the Institutional Animal Ethics Committee from the Tamil Nadu Veterinary and Animal Sciences University, Chennai - 600 051 and all the institutional guidelines were followed.

Results and discussion

The data on hatch weight, transit weight loss, body weight, weight gain, feed consumption, feed conversion ratio, livability are presented in table 1.

The hatch weight showed no significant difference (46.70 to 46.77 g) at the start of the experiment. However, ECNS fed chicks lost significantly (P<0.01) less body weight than control during transit. While, it was 10.78 in control chicks, it was 7.55 in corn-soybean and fish meal with steaming (CSF WS); 8.82 in groups fed with commercial broiler pre starter diet (CBPSD) ECNS; 9.12 per cent in corn soybean fish meal without steaming (CSF WOS) fed chicks. Panda *et al.* (2006) [8], who reported that chicks deprived of feed up to 48 h lost 4.7 g of body weight however, those given immediate access to feed after post-hatch gained 11.3 g weight over the same period.

Table 1: Effect of ECNS feeding on the growth performance of broilers (Mean \pm S.E)

Treatments	Hatch weight (g)	Transit weight Loss (%)	Body weight (g)	Weight gain (g)	ECNS intake (g)	Feed consumption (g)	FCR	Livability
Control	46.76 \pm 0.10	10.78 ^a \pm 0.25	1654.41 ^b \pm 25.94	1609.64 ^b \pm 26.02	0.00 \pm 0.00	2759.30 \pm 36.00	1.72 \pm 0.02	96.67
ECNS - EWPG	46.77 \pm 0.09	9.70 ^{ab} \pm 0.28	1700.70 ^a \pm 16.76	1655.47 ^a \pm 16.97	9.03 ^b \pm 0.31	2709.10 \pm 33.29	1.64 \pm 0.03	98.89
- CSF WOS	46.76 \pm 0.10	9.12 ^b \pm 0.24	1702.41 ^a \pm 15.38	1656.13 ^a \pm 25.83	8.78 ^c \pm 0.07	2726.80 \pm 27.80	1.67 \pm s.02	98.89
- CSF WS	46.73 \pm 0.10	7.55 ^c \pm 0.21	1702.93 ^a \pm 22.98	1659.99 ^a \pm 30.15	9.41 ^{ab} \pm 0.06	2718.90 \pm 33.02	1.66 \pm 0.02	100.00
- CBPSD	46.70 \pm 0.10	8.82 ^{bc} \pm 0.27	1713.61 ^a \pm 24.81	1666.86 ^a \pm 26.02	9.60 ^a \pm 0.08	2750.30 \pm 20.29	1.65 \pm 0.01	100.00
Significant	NS	**	**	**	*	NS	NS	

Means with at least one common superscript in the same row do not differ significantly

* (P<0.05), ** (P<0.01)

At six week of age, significantly (P<0.01) higher body weight was recorded in all ECNS fed broiler chicken (1713.61 to 1700.70 g) than control (1654.41 g). ECNS feeding had significantly (P< 0.01) improved sixth week body weight gain (1666.86 to 1655.47 g) than control (1609.64 g). The findings of the present study were in agreement with the result of Tabeidian *et al.* (2011) [9] opined that delayed access to feed for 24 or 48 h resulted in lower weight gain of 9.9 and 8.1 g/d during the first seven days of age respectively. They also observed that feeding diets containing egg powder, glucose syrup for 24 and 48 h and both egg powder and glucose syrup for 24 h resulted in higher weight gain than control. However, this finding is contrary to the report of Vargas *et al.* (2009) [10] who reported that the 12 h of fasting immediately after hatch did not significantly influence the body weight gain when compared to the non-fasted group at 42 d of age.

The cumulative feed consumption and feed conversion ratio (FCR) up to six week of age were not significantly affected between the treatments in this study. However, the feed consumption was numerically higher in control (2759.30 g) followed by CBPSD (2750.30 g), CSF WOS (2726.80 g), CFS WS (2718.90 g) and EWPG (2709.10 g) respectively at six weeks of age. Similarly the FCR showed a numerical difference between control and treatment groups, ranged from 1.64 (EWPG) to 1.72 in control. However ECNS fed groups recorded numerically better FCR compared to control birds

which were subjected to 24 h fasting. Abed *et al.* (2011) [11] concluded that chicks with immediate access to feed and water had higher feed consumption than those deprived upto 48 h post-hatch. The findings of present study with respect to feed conversion ratio concurred with the findings of Noy and Sklan (1999) [12] who observed no significant differences in feed efficiency in chicks upto marketing age, subjected to different early access to feed, oasis, liquid hatchery supplement or water.

The livability up to six weeks of age was lower in control (96.67 per cent) and in the ECNS fed group it was ranged from 98.89 (EWPG and CSF WUS) to 100 per cent (CSF WS and CBPSD). Kidd *et al.* (2007) [13] confirmed the present findings, and reported that the per cent mortality of broilers increased (2.1 to 2.2 per cent) up to 37 d of age when feeding was delayed by 5 h after hatch. The improved production performance in ECNS fed chicks might be due to decreased transit weight loss, improved growth rate, reduced early chick mortality and livability in adult birds. From the results of present study it could be concluded that the early post hatch feeding of ECNS improved the production performance and livability of commercial broiler chicken.

Acknowledgement

The author greatly acknowledged the Tamil Nadu Veterinary and Animal Sciences University, Chennai-51 for providing all

infra structural facilities and fund to carry out this work.

References

1. Bhanja SK, Devi C, Panda AK, Shyamsunder G. Effect of post hatch feed deprivation on yolk sac utilization and performance of young broiler chickens. *Asian -Aust. J Anim. Sci.* 2009; 22(8):1174-1179.
2. Dibner JJ, Kitchwell ML, Atwell CA, Ivey FJ. The effect of dietary ingredients and age on the microscopic structure of the gastrointestinal tract in poultry. *J Appl. Poult. Res.* 1996; 5:70-77.
3. Halevy OA, Geyra M, Barak Z, Uni D, Sklan D. Early post hatch starvation decreased satellite cell proliferation and skeletal muscle growth in chicks. *J Nutr.* 2000; 130:858-64.
4. Noy Y, Geyra A, Sklan D. The Effect of early feeding on growth and small intestinal development in the posthatch poult. *Poult. Sci.* 2001; 80:912-919.
5. Panda AK, Bhanja SK, Shyam Sunder G. Early post hatch nutrition on growth and a development in commercial broiler chickens – a review. *Anim. Nut. Feed. Tech.* 2013; 13:323-333.
6. BIS. Bureau of Indian Standards of poultry feed. Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi, India, 2007.
7. SPSS. Statistical software package for the social sciences SPSS, version 17. Int., USA, 1999.
8. Panda AK, Shyam Sunder G, Rama Rao SV, Raju MVLN. Early nutrition enhances growth and speeds up gut development. *World Poult. Nutr.* 2006; 22:15-16.
9. Tabeidian SA, Toghyani M, Modaresi A, Jalalizand MA. Effect of fasting or post-hatch diet's type on performance of broiler Chicks International Conference on Food Engineering and Biotechnology IPCBEE vol.9 (2011) © IACSIT Press, Singapore
10. Vargas FSC, Baratto TR, Magalhães FR, Maiorka A, Santin E. Influences of breeder age and fasting after hatching on the performance of broilers. *J Appl. Poult. Res.* 2009; 18:8-14.
11. Abed F, Karimi A, Sadeghi GH, Shivazad M, Dashti S, Sadeghi-Sefidmazgi A. Do broiler chicks possess enough growth potential to compensate long-term feed and water deprivation during the neonatal period? *S. Afr. J 34 Anim. Sc.* 2011; 41:33-39.
12. Noy Y, Sklan D. Different types of early feeding and performance in chicks and poults. *J Appl. Poultry Res.* 1999; 8:16-24.
13. Kidd MT, Taylor JW, Page CM, Lott BD, Chamblee TN. Hatchery feeding of starter diets to broiler chicks. *J Appl. Poult. Res.* 2007; 16:234-239.