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Comparison of different industrial methods of post-hatch feeding on performance of broilers

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ABSTRACT

In order to investigate the effect of industrial methods of early post-hatch feeding of broilers on performance, 105 one-day-old chicks (Ross 308) divided to 5 treatments. In first 24 hours after hatch, the following treatments: supplementing water with electrovite or sugar and diet with corn meal powder were compared to control (fasting) and shame (starter diet) groups. In the 2nd, 7th and 10th days of experiment, body weight and feed intake of every replicate was measured. By using SAS statistical program including completely randomized design and Duncan test, results showed that 24 hours post hatch, body weight increases in all groups in comparison to control (P≤0.05) and treatments did not have affects on feed consumption (P>0.05).

Key words: Broiler, post- hatch feeding, performance, digestive tract.

INTRODUCTION

Establishment of a stable and sufficient glucose status is critical for the posthatch development of chicken until feed consumption is initiated. Toward the end of incubation, embryos use their energy reserves to meet the high demand for glucose to fuel hatching activities [3, 6, 7, 10] and afterward, due to chicks remaining in hatcheries and the distance between hatcheries and farms, hatchlings do not have access to diet during the first 24 to 36 hours posthatch [8, 11, 12].

Thus, the glucose level available to posthatch survival is dependent upon the glycogen reserve and gluconeogenesis, which is induced when glucose intake is insufficient to meet the metabolic glucose demands [5].

To reduce the use of glucose reserves of neonatal chicks, we hypothesized that administration of different types of carbohydrate's rich nutrients (corn meal powder into diet and sugar in water) would support the energy status of the hatchling, and thus contributing to enhanced posthatch performance [2]. In addition to the carbohydrate source, we used insetting electrovite into water to investigate its effect on stress reduction of hatchlings.

The objective of this study was to measure effects of industrial posthatch feeding methods, containing starvation, access to starter, carbohydrate's rich nutrients and electrovite on body weights and feed consumption of broiler chicks from 1 until 10 d posthatch.

MATERIALS AND METHODS

One hundred and five one-day-old broilers (Ross 308) were randomly divided to 5 groups with 3 replicates that every replicate includes 7 chicks which bred for 10 days. They randomly transferred to 15 Pens (0.66*0.66) with permanent lighting.

Treatments were as follows in first 24 hours after hatch:

1. Control group (starvation with access to water).
2. Shame group (access to starter diet *ad-lib* and water without any additives).
3. Access to starter diet *ad-lib* and water containing electrovite (based on the order on its package).
4. Access to starter diet *ad-lib* and water containing 5% sugar.
5. Access to starter diet *ad-lib* containing 10% corn meal powder and water.

Statistical model design: Data was analyzed in a completely randomized design by using SAS v9 / 2 (2009) and if there was a significant difference between the averages, they were compared by using the Duncan test [9].
Body weight and feed intake were measured for every pen on 2nd, 7th and 10th days of experiment.

RESULTS

A) Body weight: findings of body weight have been inserted in Table 1.

Table 1: Comparison of average body weights

days / **treatments**	1	2	7	10
1 starvation (control)	42.14	42.61 ^{c}	110.27	166.00
2 starter diet (shame)	42.14	47.14 ^{ab}	119.16	174.00
3 electrovite	42.91	47.61 ^{a}	126.94	184.00
4 sugar	41.20	45.23 ^{b}	113.33	175.67
5 corn meal powder	41.90	47.38 ^{a}	115.44	170.00
	ns	*	ns	ns

ns = lack of significant difference between treatments (P>0.05)
** = Significant differences between treatments (P≤0.05)*
a,b,c = in each column represents the differences between treatments

According to table 1, the average of body weights at the first day of breeding did not show any statistically significant differences (P>0.05) between treatments but after 24 hours, the control group had the lowest body weight as we expected due to its fasting for 24 hours and usage of yolk sac and body component during this time (P≤0.05). On the other hand, the groups with access to electrovite and corn meal powder had the highest body weight (P≤0.05) but access to sugar could not increase body weight compared to mentioned above groups (P≤0.05). Also, the shame treatment (access to starter diet) had not significant differences (P>0.05) with treatments 3, 4 and 5 but had higher body weight in comparison to control (P≤0.05).

Therefore, it is obvious that early access to starter diet increase body weight in comparison to fasting which results to body weight loss. In addition, supplementation of diet and water with corn meal powder or electrovite respectively cause to more body weight development. Also, it is noticeable that in terms of numerical, body weight gain of electrovite group continues until day 10 of breeding period without any significant differences between all of experimental groups.

B) Feed intake: findings of feed consumptions have been shown in Table 2.

Table 2: Comparison of average feed intakes

days / **treatments**	2	7	10
1 starvation (control)	0 ^{b}	95.55	75.00
2 starter diet (shame)	3.80 ^{a}	98.88	76.66
3 electrovite	2.85 ^{a}	105.28	77.66
4 sugar	2.61 ^{a}	96.38	68.66
5 corn meal powder	3.56 ^{a}	92.97	67.33
	*	ns	ns

ns = lack of significant difference between treatments (P>0.05)
** = Significant differences between treatments (P≤0.05)*
a,b = in each column represents the differences between treatments

According to table 2, except for the first 24 hours when control treatment did not have access to feed, other average feed intakes did not show any significant differences between treatments (P>0.05).

DISCUSSION

The results of this experiment makes clear that early access to starter, especially supplementing diet by corn powder or water by electrovite have positive effects on broiler performance in comparison to fasting during first hours after hatch. The results of this study match with experiments conducted by [1] and [4] that showed all of broilers with early feeding had higher body weight compared to control.

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