



LIGHTING DURING INCUBATION AND GROW OUT OF BROILERS FED MASH DIETS

Introduction

Updated codes of practice for broiler chicken production in Canada have been approved and are soon to be released. The recommendation will be that broiler chickens be provided at least 4 hours of dark each day after they are past the early brooding period. This provision of longer hours of darkness has been shown to improve liveability (reduce heart disease), feed efficiency and growth rate of broilers grown for 35 days or longer (Schwean-Lardner et al., 2013). However these studies have consistently used feed that was pelleted prior to delivery to the birds. There is concern that not enough is known about the impact the shortened daylength may have on performance of broilers that are fed non-pelleted or mash diets.

A substantial portion of the broiler producers in Atlantic Canada are feeding their birds mash diets. The majority of these have access to milling capacity allowing them to formulate their own feed without the added expense of pelleting the feed. Savings in feed costs allows producers to absorb some reduced growth performance. Birds take longer to eat when provided feed in the form of mash compared to pelleted diets and there is concern that if dark periods are extended growth rate will be reduced to unacceptable levels.

Objective

Determine the influence of feed form on bird performance in an environment starting with incubation, of near continuous light (23 h per day) compared to an environment with longer dark periods (20 h light per day).



Photos courtesy X. Li.

Trial

Ross 308 eggs were placed in incubators equipped with LED lighting and given 12 hrs of light per day for the duration of the 21 day incubation cycle. An equal number of eggs were set in 4 incubators that operated in the darkness.

Four rooms with 16 pens each were used in this study. Within a room half of the pens were randomly populated with chicks hatched from incubators equipped with lights and the other half with chicks hatched in the dark. Each pen contained 42 birds with a 50:50 ratio of males to females to simulate straight run production. The lights were left on at 30 lux intensity for 23 h the first 3 days in all four rooms.

On day 4 two rooms were switched to a photoperiod of 20 h of light and 4 h of dark while the other two remained on a 23 h light, 1 h dark period.

On an equal basis half of each group of chicks were provided feed that was pelleted (crumbled for starter) and the other half were provided with mash diets from day 1 through to 33 days of age. The birds were weighed at the start of the trial and at the end of each phase.

Results

Day 33 body weights did not differ ($P>0.05$) regardless of whether the eggs were incubated in the dark or light and the birds were raised with either 20 or 23 hours of light when they were fed pelleted feed (Table 1). When birds were hatched with light and fed a mash diet there was no difference ($P>0.05$) between birds grown in 20 hours of light (1958 g) or 23 hours (1947 g). However, when birds were hatched in the dark as they are conventionally, raising them in 20 hours of light increased ($P<0.05$) the 33 day body weight (1998 g) compared to birds raised under 23 hours of light (1906 g).

Table 1. Effect of incubation photoperiod, growing photoperiod and feed form on 33 day body weights

Incubation Photoperiod							
Dark				12 hours Light			
Growing Photoperiod							
20 L: 4 D		23 L: 1 D		20 L: 4 D		23 L: 1 D	
Feed Form							
Mash	Pellets	Mash	Pellets	Mash	Pellets	Mash	Pellets
1998 b	2316 a	1906 d	2315 a	1958 bc	2343 a	1947 cd	2311 a
SEM	9						

a-d Lsmeans are significantly different ($P<0.05$)

Industry Impact:

The Nova Scotia broiler industry is concerned about a potential negative impact on growth performance with birds provided mash feed when the updated Codes of Practice require producers to provide the birds a minimum of 4 hours of dark per day. Small changes in growth performance early on in production can have a large impact on performance throughout. Any reduction in growth rate is potentially viewed as a negative impact on economics of broiler production especially in terms of feed efficiency as it is the most costly input. Results indicated that when eggs are incubated in the dark, providing 4 hours of darkness per day during the growing period improved market body weight when the broilers were fed a mash diet.

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Reference:

K, Schwan-Lardner, Fancher, B.I., Gomis, S., Van Kessel, A., Dalal, S., and Classen, H.L. 2013. Effect of day length on cause of mortality, leg health and ocular health in broilers. *Poult. Sci.* 92(1): 1-11.

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