

Effect of lighting on growth of layers

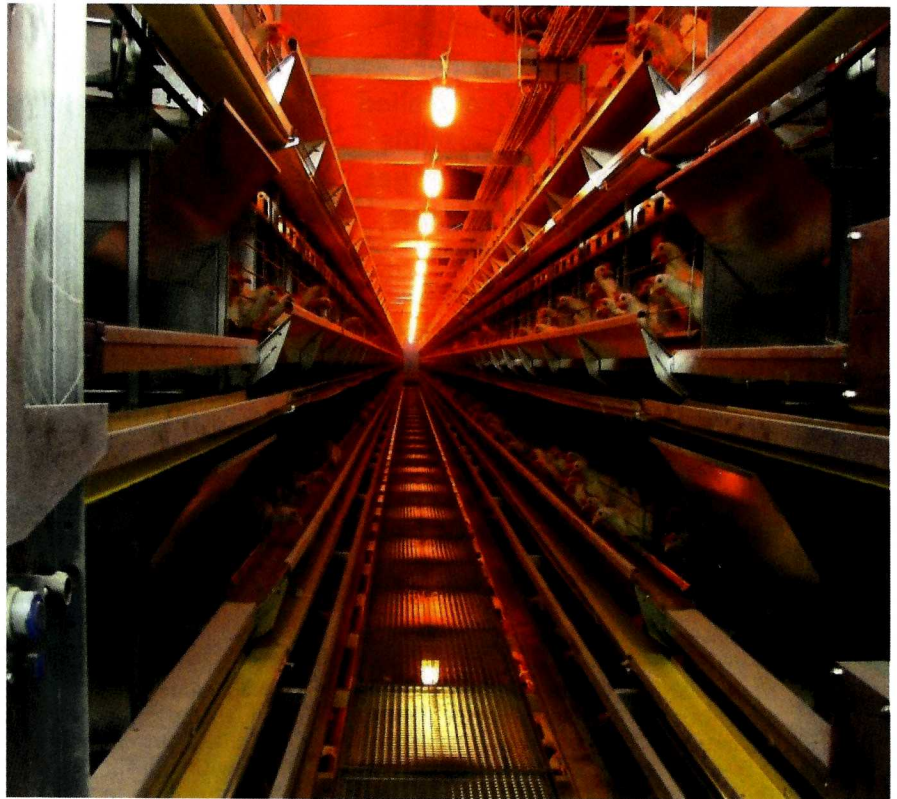
Slow, moderate and rapid step down light programmes have a significant effect on the growing period of commercial layers as well as on the daily production of the birds. These conclusions can be drawn from two experiments with Hy-Line layers in the USA.

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It is often questioned what the effect is of slow (SL), moderate (ML) and rapid (RL) step down light programmes on layer performance. To better understand the effect of light, two experiments were conducted. The first experiment compared the effect of the three light programmes during the growing period of commercial layers. The experiments were carried out in two phases: Phase 1 compared W36 and W98, and Phase 2 included one white (W98) and one brown (HYB) egg variety. A total of 500 pullets per variety were individually wing banded at hatching and moved to the grow house by variety with 20 hours (h) of light during the first week. Three replicates were kept in separate pens by variety-light programmes during the rest of the growing period. The light programmes differed in the rate of step down duration of artificial light exposure.

All groups started with 20 h light at week one; thereafter, the light exposure decreased 1h/2wk (SL), 1h/wk (ML) and 4h/wk (RL), to 13, 9 and 12 h at weeks 15, 12 and 3 for SL, ML and RL, respectively. Thereafter, SL plateaued at 13 h of light ML and RL plateaued at 9 h till week 17 when all treatments received 10 h of light. Individual body weights were collected weekly in the grow house up to 17 weeks of age when the birds were transferred to the layer house. Body weight records were analysed by variety using least square means procedures. The model included the effect of light programmes and pen within light programmes, age (wk) and its interaction with light programmes and residual.

The models' R-squares were over



The light programme during rearing has an effect on production performance during lay.

0.93 for both lines and phases. The lighting programmes caused significant differences in growth. In general, body weight was highest for SL and smallest for RL, being intermediate for ML. In Phase 1 SL birds were, relative to ML and RL, respectively, +18 and +52 g for W36, and -4 and +20 g for W98. In Phase 2 these figures were +23 and +36 g for W98, and +24 and +45 g for HYB. The SL treatment resulted in the heaviest pullets.

Laying period egg production

The second experiment to compare laying period effects of slow, moderate and rapid growing light programmes was set up with the same two-phase structure, number of pullets, varieties and lighting programmes as the first experiment. Again, all groups started with 20 h light at week one; thereafter, the light exposure decreased 1h/2wk (SL), 1h/wk (ML) and 4h/wk (RL), to 13, 9 and 12 h at weeks 15, 12 and 3 for SL, ML and RL, respectively. Thereafter, SL plateaued at 13 h of light and ML and RL plateaued at 9 h till week 17 when all treatments received 10 h of light.

Afterwards, 2h/wk light increase was applied to 16 h, and then kept constant during the whole laying period. Data was collected on sexual maturity, daily production, and individual weekly body weights. Production records were analysed by variety using least square means procedures. The model included the effects of light programmes, week of production and their interaction.

Data was analysed as daily hen housed production pooled by week of production. Additional models were treated the week of production as a regressor variable at different degree polynomial. Significant production differences occurred among the light programmes, especially during the pre-peak period. The RL excelled in Phase 1 due to an earlier sexual maturity and higher peak of production. On average, SL birds were 44 and 87 g heavier than ML and RL for W36 and 38 and 83 g for W98. In Phase 2, the effect of light programmes was not significant for PD in HYB, but SL birds were 24 and 45 g heavier than ML and RL. For W98, PD trend was similar to that in PH1, and SL birds were 12 and 51 g heavier than ML and RL. ■