Effects of Three Lighting Programs During Grow on the Performance of Commercial Egg Laying Varieties

2. Laying Period Egg Production


Hy-Line International    Dallas Center, Iowa
Management:

- Birds were wing banded at hatch.
- Pullets were reared in floor pens during the growing period and transferred to the layer house at 17wk of age.
- Hen were housed individually in 25.4 x 35.6 x 40.6 cm cages for individual egg recording.
- Each cage was equipped with one drip nipple.
- A phase feeding program was used according to Hy-Line Commercial Management Guides.
- Corn-Soybean meal based crumbled diets were fed during growing and mash diet were fed during laying.
Beginning at 17wk of age, all pullets are subjected to an identical photoperiod of 10h with gradual increases in the photoperiod at weekly intervals until 16h photoperiod at 30 wk of age.

The 16h photoperiod was maintained for all hens until the end of experiment.
Three Rearing Light Programs

- Slow
- Rapid
- Moderate
Light intensity was the same for the three lighting regimes.

1\textsuperscript{st} week; all chicks were exposed to 30 lux light intensity

2\textsuperscript{nd}-5\textsuperscript{th} weeks; intensity decreased 5 lux/week

6\textsuperscript{th}-17\textsuperscript{th} weeks; all pullets received 7 lux of light intensity

After 17\textsuperscript{th} week; light intensity was increased to 30 lux
Traits (individual):

• Weekly body weight
• Age at sexual maturity
• Daily egg production
• Egg weight (first-3 and 26, 36, 46, 56 and 66 wk)
RESULTS
Light Test #1, W36 Body Weight 18-58wks

Body Weight, g

Slow
Moderate
Rapid
Light Test #1, W98 Body Weight 18-58wks

Body Weight, g

Slow  Moderate  Rapid
Light Test #2, W98 Body Weight 18-58wks

Body Weight, g

Slow  Moderate  Rapid
Light Test #2, HYB Body Weight 18-58wks

Body Weight, g

1100
1200
1300
1400
1500
1600
1700
1800
1900
2000

18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56

Slow
Moderate
Rapid
Trial #1: Sexual Maturity by Line and Lighting Program

Day

125
130
135
140
145
150
155

W36

W98

Slow
Moderate
Rapid

Legend:

Slow
Moderate
Rapid
Trial #2: Sexual Maturity by Line and Lighting Program

Day

HYB

W98

Slow

Moderate

Rapid

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Trial #1: Egg Numbers by Line and Lighting Program

- W36
- W98

Egg Numbers

- Slow
- Moderate
- Rapid
Trial #2: Egg Numbers by Line and Lighting Program

Egg Numbers

HYB  W98

- Slow
- Moderate
- Rapid

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Trial 1. W36 Production by Treatment
Trial 2. HYB Production by Treatment

HH (%) vs. Age (wk)

- M
- R
- S
Trial 2. W98 Production by Treatment

HH (%) vs Age (wk)
Light Test #1; W36 Egg Weights, g

<table>
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<th></th>
<th>Slow</th>
<th>Moderate</th>
<th>Rapid</th>
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<tbody>
<tr>
<td>First 3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>26wk</td>
<td></td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>36wk</td>
<td></td>
<td>a</td>
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<tr>
<td>46wk</td>
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<td>a</td>
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</tr>
<tr>
<td>56wk</td>
<td></td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>66wk</td>
<td></td>
<td>a</td>
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</table>

Egg Weight, g

- 3.3
- 1.4
- 1.5
- 1.6
- 1.5
- 1.5

© Hy-Line International
Light Test #1; W98 Egg Weights, g

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<tr>
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<tr>
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<tr>
<td>66wk</td>
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Light Test #2; HYB Egg Weights, g

Egg Weight, g

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<td>46wk</td>
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<tr>
<td>56wk</td>
<td>1.4</td>
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<tr>
<td>66wk</td>
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Light Test #2; W98 Egg Weights, g

Egg Weight, g

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Conclusions

- Differences in growth rate due to lighting program tended to continue during the lay period as a residual effect.
- In general, birds from the rapid step down lighting program tended to reach sexual maturity earlier, to attain peak production earlier, and to produce more eggs than those faster growing & heavier birds of the slow program.
- Most of the differences in egg production were due to differences in age at sexual maturity and seem to confirm an antagonism between growth and onset of reproduction ability.
Conclusions & Implications

- Differences in egg weight were consistent, with heavier birds (S) producing heavier eggs along the trajectory. Differences were largest at the beginning of the lay period (first 3-eggs).
- Final conclusions are pending evaluation of differences between treatments for other traits such as egg mass, egg quality, and bone structure, which are ongoing.
Thank you!

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2. Laying Period Egg Production

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