

Genetic selection on home pen locomotor activity in chickens:

selection program and direct responses

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1. Introduction

It has been suggested that feather pecking in laying hens might be genetically linked to their activity level (Kjaer, 2009). If feather pecking and activity are genetically correlated, selection for increased activity should lead to higher levels of feather pecking. Also, increased activity is known to increase bone strength in layers and leg health and gait in broilers, but genetic correlation between activity recorded as undisturbed locomotor behaviour in the home pen and growth rate has not yet been estimated. This poster presents how such lines were developed and the preliminary data on direct responses on activity and pullet growth rate. Observations on feather pecking is not yet available.

2. Materials and methods

Genetic lines

- **LOW:** A line selected for low activity
- **HIGH:** A line selected for high activity
- **CON:** An unselected control line of pure-line New Hampshire laying hens

Selection scheme

In each generation and line, 10 sires and 20 dams produced an average of 200 offspring for selection. In the fourth generation (S4), 850 chickens of all three lines were phenotyped for activity and body weight for comparison.

Recording activity

Activity was recorded individually and automatically for all birds over 5 days in the home pen at 5 weeks of age, using a transponder system (Gantner Pigeon Systems, Schruns, Austria).

3. Results

Response to selection was good and better in the high line than in the low, see Figure 1. Activity in LOW and HIGH was 58% respectively 208% relative to CON.

In S4 the LOW chickens had lower (GLM, $F_{2,850} = 96$, $P < 0.001$) BW at 6 weeks of age compared to the CON and HIGH chickens, which did not differ significantly (368 g, 413 g and 407 g respectively). Figure 2 shows the relative weight of the LOW and HIGH lines.

4. Discussion and conclusion

- The data suggest that chicken lines can be selected for higher activity, within reasonable limits, without reducing pullet growth rate.
- Further experiments are needed to confirm the effect using modern broiler lines.
- This method might be used to counteract some of the problems of intensive selection on egg production in layers and growth rate in broilers, namely reduced bone strength, leg health and walking ability.
- By selecting for increased activity, chickens might indirectly experience increased leg health and better gait score.

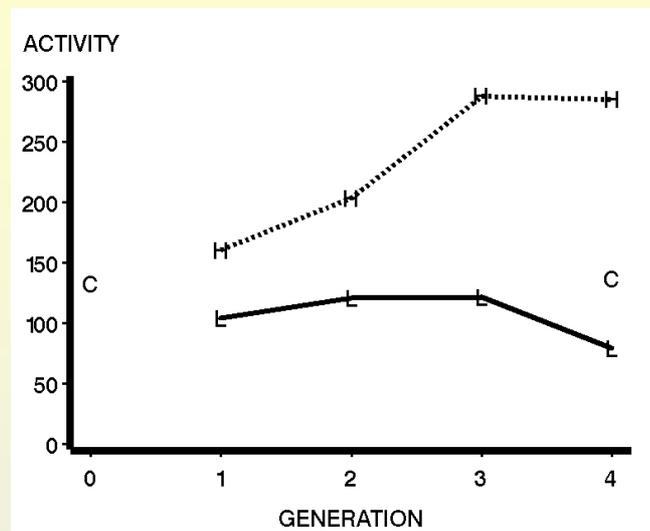


Figure 1 Activity recorded as average number of crossings over the antennas per chicken per day at 5 weeks of age. Legend: L = Low activity, H = High activity and C = Control line

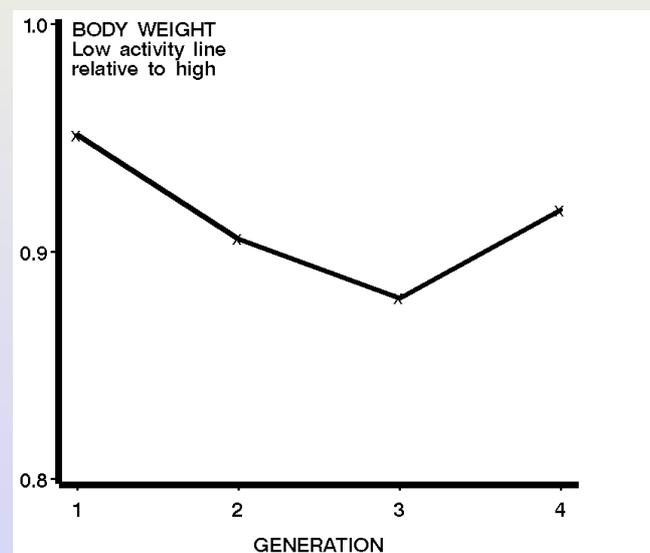


Figure 2 Relative body weight (Low activity line / high activity line) at 6 to 9 weeks of age. Age varies between generations, but not within generation. See Results section for statistics

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