



The relationship between chick characteristics, broiler welfare and growth

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Introduction

In hatchery management, one-day-old chick quality is related to breeding and hatching conditions. However, it is likely that one-day-old chick quality is also related to broiler welfare and growth. Therefore, we studied if day-old chicks of optimal quality differ from day-old chicks of suboptimal quality in welfare aspects (behaviour, walking ability) and production aspects (growth) between 1-8 and 35-42 days of age. In addition, chicks were housed in a high (standard) and low density to study if the effect of day-old chick quality on broiler welfare and growth can be modified by housing density.

Methods

- 192 day-old broiler chicks (Ross 308) were used;
- 96 chicks were scored as optimal chicks using the Pasgar@score¹ and received a score of 10 points (P10);
- 96 chicks were scored as inferior chicks using the Pasgar@score¹, i.e. they had too much yolk, red hocks and navel abnormalities and received a score of 7 points (P7);
- chicks were housed in groups of 4 in pens with wood shavings, two P10 and two P7 chicks per pen;
- half of the groups were housed at high (0.09 m²/chick) (HD) and half of the groups at low (0.20 m²/chick) (LD) density;
- T-maze behaviour (social reinstatement²), behaviour in a novel environment, asymmetry, vocalisations in isolation, body temperature and walking ability (gait score, latency-to-lie test³ and step width⁴) were measured between 1-8 and 35-42 days, growth was measured weekly.



Figure 1. T-maze.



Figure 2. Latency-to-lie test.



Figure 3. Measurements of step width.

Results

Table 1. Significant differences between P7 and P10 chicks or broilers. The table shows means of parameters measured and the corresponding P-values.

Test	Parameter	P7	P10	P-value
Growth	weight (gr) day 1	38.6	36.5	<0.001
	weight (gr) day 4	59.2	57.8	0.02
	weight (gr) day 8	121.4	118.4	0.08
	relative growth week 1 (%)	215.4	225.1	0.03
Asymmetry	wings (score) day 8	0.04	0.03	0.05
Walking ability	gait score day 39	0.84	0.49	0.01
	latency-to-lie (sec) day 40	210	263	0.06
	step width (cm) day 39	9.55	8.61	0.006

Table 2. Significant differences between LD and HD chicks or broilers. The table shows means of parameters measured and the corresponding P-values.

Test	Parameter	LD	HD	P-value
T-maze	latency to leave start box (sec) day 2	35.9	53.4	0.05
	latency to reach mirror day 2	39.9	57.6	0.02
	latency to correct arm (sec) day 2	44.8	60.7	0.03
Isolation test	vocalisations, frequency/min day 8	105	100	0.08
	escape attempts day 8	0.5	0.2	0.09
Behaviour in novel environment	standing (% time) day 42	45.2	36.7	0.07
	foraging (% time) day 42	49.4	42.3	0.05

Conclusions

Results show that differences between P7 and P10 chicks are small. However, P10 broilers suffer less from leg weakness as compared to P7 broilers. LD chicks show more social reinstatement and vocalise and escape more in isolation as compared to HD chicks. LD broilers are more active in the novel environment as compared to HD broilers. No interactions between housing density and chick quality were found. Although day-old-chick quality seems to be related to broiler welfare we suggest that low quality chicks are partly able to compensate the initial lack of quality during the rearing period.

References

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