



SSPE-CT-2004-502315

LAYWEL

Welfare implications of changes in production systems for laying hens

Specific Targeted Research Project (STReP)

Thematic Priority: Integrating and strengthening the ERA, Area 8.1.B.1.4, task 7

Deliverable 4.2

Prevalence of feather pecking in various production systems

Due date of deliverable: 12

Actual submission date: 18

Start date of project: 1/1/2004

Duration: 24 month

Organisation name of lead contractor for this deliverable: UNIVBRIS

Revision [final]

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	x
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Prevalence of feather pecking in various production systems

(Task 4.2 of the LayWel project)

UNIVBRIS has been working on compiling published information on prevalence of feather pecking in various production systems. This is expected to be finished by the end of June 2005. Tables are being compiled giving information about studies (i) where large numbers of flocks have been examined and the % of flocks exhibiting feather pecking reported (ii) where birds within individual flocks have been observed and the % of birds exhibiting feather pecking or the mean pecks per bird per hour estimated. The report will consider information only from birds housed in commercial-scale systems (not very small experimental trials). We then need to obtain information from the LayWel database in order to complete the report.

During 2004 UNIVBRIS has been working on collecting and analysing data on feather pecking, dustbathing etc. from 36 flocks of a major stocking density trial in single-tier aviaries (6 different stocking density/management treatments, each replicated 6 times).

The results are summarized in the following table.

<u>Value</u>	<u>Sample size</u>	<u>Authors</u>	<u>Farm Type</u>	<u>Flock type</u>	<u>Details of Study</u>
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Studies reporting proportion of flocks affected by feather pecking:

46.6% said feather pecking was normal, 56.6% said they had noted f.p. in their last flock. The median % of birds in a flock affected was 30%, the median age f.p. started was 40 wks, and the 1 st deaths were at 45.3 wks.	198 farms with relevant answers (from 637 farms surveyed).	Green et al., 2000	26 from perchery or barn systems, 172 from free range systems.	ISA/ Lohmann/ Hisex/ Hyline/ Shaver/ CBT. 98.5% of flocks were beak-trimmed.	Farmers observations of bald patches, blood on hens, damaged feathers, hens pulling out own feathers and those of other hens, hens eating feathers. All information relates to last depleted flock for each farm, thus covering the whole of lay.
40.0% and 77.3% of flocks developed considerable f.p. by 5 wks of age, and 14 wks of age respectively. (Considerable f.p. defined as >2 f.p. interaction/ bird/ hour)	25 commercial flocks (63,310 birds).	Huber-Eicher & Sebo 2001	Mixture of deep litter (with and without perches), and aviary systems (Natura, Rhis-Boleg, Volétage)	Borans Brown/ ISA Brown/ Lohmann Brown/ White Hisex/ White Hypex HN/ Lohmann White-LSL Both beak-trimmed and non beak-trimmed.	Direct observation of pecking behaviour by experimenters at 5, 14, 20, 32 and 50 wks old.

27.1% reported vent pecking as a regular occurrence in their flocks, 36.9% said v.p. had occurred in their last flock. 33.3% had both f.p. and v.p. Median % of the flock affected was 3.5%. Median age v.p. started was 37.3 wks, and median mortality attributed to v.p. was 1.3%. 1 st deaths occurred at a median age of 45 wks.	198 farms with relevant answers (from 637 farms surveyed).	Pöttsch et al., 2001	26 from perchery or barn systems, 172 from free range systems.	ISA/ Lohmann/ Hisex/ Hyline/ Shaver/ CBT. 98.5% of flocks were beak-trimmed.	Farmers observations of exposed skin, damaged feathers, blood around vent, hens eating the flesh of others.
Median % of flocks affected by f.p.: 62% (range: 0-94%) and by cloacal cannibalism: 2.65% (range: 0.4 – 12.6%).	59 flocks on 21 farms.	Gunnarsson et al., 1999	Non-cage systems: OLI Free and Vencomatic systems	ISA Brown/ Brown Hisex/ White Shaver Starcross 288/ White Dekalb delta-link/ White Lohmann Selected Longhorn. No birds were beak-trimmed.	Feather damage recorded by trained observers between 33 and 40 weeks. Cannibalism recorded post mortem.
% flocks in each housing system showing cannibalism, range: 2.3 – 17.4%	2842 flocks	Morgenstern & Lobsiger, 1993	Alternative housing systems, including free range, deep litter, aviary, slatted/ wire floor, and group cages	Variety of laying hens.	Survey of health problems in laying hen flocks in Sweden. (Limited information from abstract)
37.5% of flocks show f.p. behaviour.	66 farms.	Huber-Eicher, 1999	Deep-litter and aviary systems.	Variety.	Experimenters collected the data during a 3 hour interview with each farmer.

Studies reporting proportion of birds, within flocks, affected by feather pecking:

F.p. established in 27 of 71 rearing cages by 17 days, 1 st death from cannibalism occurred at 2 weeks. 3.7% of flock dead due to cannibalism. 10.6% of flock dead due to cannibalism during lay.	3879 chicks in 71 cages	Allen and Perry, 1975	Battery laying house.	Babcock B300 light hybrid. No birds were beak-trimmed.	Feather damage scored to estimate rates of f.p; assessments were done at 18, 23, 31, 51 and 67 weeks. Dead birds underwent post mortems.
94%, 48% and 52% of birds performed f.p. at 6, 38 and 69 wks of age respectively. Average number of pecks per bird per hour: 3, at 38 weeks.	310 hens	Kjaer and Sørensen, 1997	Aviary systems	White Leghorns. Non- beak trimmed.	Experimenters recorded feather pecking interactions during observation periods at 6, 38 and 69 weeks of age.
At 6 weeks: A mean of 1.06% of birds feather pecked. At 12 weeks: 0.06% and 1.07% of birds pecked when reared at low and high densities respectively.	3120 birds (Half reared at low, and half at high density)	Hansen & Braastad, 1994	Pens at low density: 6.5 birds/m ² , and at high density: 13 birds/m ² .	White leghorns.	Behavioural observations for 6 hours on each of 4 consecutive days at 6 and 12 weeks.
% deaths due to cannibalism range: 1 – 30%.	16,500 birds on 11 farms.	Koene, 1997	Hens kept under extensive housing conditions (EKO and Biological dynamical). Non-beak trimmed.	ISA and Hisex.	Questionnaire to farmers. (Limited information from abstract)

Mean % birds performing feather pecking behaviours amongst focal hens: Gentle f.p. – 27% Sever f.p. – 11.5%	25 randomly selected focal animals from each of 10 farms.	Oden et al., 1999	Ole-Volétage aviary system. Non-beak trimmed.	ISA Brown.	Observations of focal animals by experimenter at 21, 35, 45 and 55 weeks of age.
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Studies reporting rates of feather pecking by individual birds:

Average rate of f.p. interactions range: 0.5 - 4.2 per bird per hour An average of 83.1% of birds in each group feather pecked (range: 58.1 - 100%)	10 groups of growers, 305 hens in total.	Wechsler et al., 1998	In pens, stocking density 12.6 birds/m ² .	White Lohmann Selected, White Leghorn hybrids. Non-beak trimmed.	Observers recorded number of pecking interactions for 4 periods of 30 minutes between 24 and 32 days of age.
By breed, the mean number of pecks per bird per hour was: 10.3 (LS), 7.9 (NB), 30.2 (ISA), 18.8 (LB)	2400 birds	Kjaer, 2000	Aviary systems. 12.4 birds/ m ² .	White leghorns: Lohmann selected (LS), Norbrid 41 (NB). Medium heavy: ISA Brown (ISA), Lohmann brown (LB) Non-beak trimmed.	Experimenters recorded feather pecking interactions during observation periods at 38 weeks of age.
At 35 weeks: brown hybrids performed 1.98 f.p. per bird per hour; white hybrids performed 0.84 f.p. per bird per hour. At 55 weeks: brown hybrids performed 16.8 f.p. per bird per hour; white hybrids performed 0.78 f.p. per bird per hour.	35 wks: 10 white and 31 brown flocks. 55 wks: 15 white and 39 brown flocks.	Oden et al., 2002	Ole-Volétage and Vencomatic aviary systems. Non-beak trimmed. Stocking densities range from 9.0 – 19.1 birds/m ² .	ISA Brown; Hisex Brown; LSL White; LSL Brown; Shaver White; Dekalb White	Experimenter recorded feather pecking interactions during 10 minute observation periods at 35 and 55 weeks.

Mean peck rates over all ages: Gentle – 1.77 pecks per bird per hour. Severe – 0.45 pecks per bird per hour.	319 birds	Albentosa & Nicol, 2001	16 pens with litter floors.	ISA Brown	Experimenters recorded feather pecking interaction on 5 separate occasions between 15 and 33 weeks of age.
Frequency of f.p. per bird per hour: Gentle - 1.93; 2.64; 3.28 at 15, 22, and 30 wks respectively. Severe – 0.054; 0.56; 1.17 at 15, 22, and 30 wks respectively. (Values are averaged over stocking density and location)	24 flocks	Nicol et al, 1999	Percheries. Stocking densities were 6, 14, 22 and 39 birds/ m ² , mediated by flock size. Non-beak trimmed.	ISA Brown.	Experimenters recorded feather pecking during 20 minute observation periods at 15, 22 and 30 weeks of age.
Mean frequency of f.p. per bird per hour: Gentle – 2.4; 1.8; 1.9; 2.9 at group sizes of 15, 30, 60 120 individuals. Severe – 1.1; 1.1; 1.2; 1.5 at group sizes of 15, 30, 60 120 individuals. (Averages over all ages)	900 hens	Bilčík & Keeling, 2000.	16 deep litter pens, 4 replicates of each group size. Non-beak trimmed.	Hisex white.	Experimenter recorded feather pecking interactions during observation periods at 22, 27, 32 and 37 weeks of age.

References

- Albentosa, M. and Nicol, C. J. 2001. Avoidance of a novel object is predictive of feather pecking behaviour in ISA Brown laying hens. *Proceedings of the 6th European Symposium on Poultry Welfare, Zallikofen*, pp. 198-202.
- Allen, J., and Perry, G. C. 1975. Feather pecking and cannibalism. *Br. Poultry Sci.* **16**: 441-451.
- Bilčík, B. and Keeling, L. J. 2000. Relationship between feather pecking and ground pecking in laying hens and the effect of group size. *Appl. Anim. Behav. Sci.* **68**
- Green, L. E., Lewis, K., Kimpton, C. J. and Nicol, C. J. 2000. Cross-sectional study of the prevalence of feather pecking in laying hens in alternative systems and its association with management and disease. *Vet. Rec.* **147**: 233-238 .
- Gunnarsson, S., Keeling, L. J., and Svedburg, J. 1999. Effect of rearing factors on the prevalence of floor eggs and cloacal cannibalism and feather pecking in commercial flocks of loose housed laying hens. *Br. Poultry Sci.* **40**: 12-16.
- Hansen, I. and Braastad, O. B. 1994. Effect of rearing density on pecking behaviour and plumage condition of laying hens in two types of aviary. *Appl. Anim. Behav. Sci.* **40**: 263-272.
- Huber-Eicher, B. 1999. A survey of layer-type pullet rearing in Switzerland. *Wld's Poultry Sci. J.* **55**: 83-91.
- Huber-Eicher, B. and Sebo, F. 2001. The Prevalence of feather pecking and development in commercial flocks of laying hens. *Appl. Anim. Behav. Sci.* **74**: 223-231.
- Kjaer, J. B. 2000. Diurnal rhythm of feather pecking behaviour and condition of integument in four strains of loose housed laying hens. *Appl. Anim. Behav. Sci.* **65**: 331-347.
- Kjaer, J. B. and Sørensen, P. 1997. Feather pecking behaviour in white leghorns, a genetic study. *Br. Poultry Sci.* **38**: 333-341.
- Koene, P. 1997. Cannibalism in extensive poultry keeping in the Netherlands: an inventory. *Proceedings of the 5th European Symposium on Poultry Welfare, Wageningen*, pp. 147-148.
- Morgenstern, R. and Lobsiger, Ch. 1993. Health of laying hens in alternative systems in practice. *Proceedings of the 4th European Symposium on Poultry Welfare, Edinburgh*, pp. 81.
- Nicol, C. J., Gregory, N. G., Knowles, T. G., Parkman, I. D., and Wilkins, L. J. 1999. Differential effects of increased stocking density, mediated by increased flock size, on feather pecking and aggression in laying hens. *Appl. Anim. Behav. Sci.* **65**: 137-152.
- Oden, K., Vestergaard, K. S., and Alger, B. 1999. Agonistic behaviour and feather pecking in single-sexed and mixed groups of laying hens. *Appl. Anim. Behav. Sci.* **62**: 219-231.
- Oden, K., Keeling, L. J. and Algers, B. 2002. Behaviour of laying hens in two types of tiered aviary systems on 25 commercial farms in Sweden. *Br. Poultry Sci.* **43**: 169-181.
- Pötzsch, C. J., Lewis, K., Nicol, C. J. and Green, L. E. 2001. A cross-sectional study of the prevalence of vent pecking in laying hens in alternative systems

and its associations with feather pecking, management and disease. *Appl. Anim. Behav. Sci.* **74**: 259-272.

- Wechsler, B., Huber-Eicher, B. and Nash, D. R. 1998. Feather pecking in growers: a study with individually marked birds. *Br. Poultry Sci.* **39**: 178-185

Acknowledgement

This report has been co-financed by the European Commission, within the 6th Framework Programme, contract No. SSPE-CT-2004-502315. The text represents the authors' views and does not necessarily represent a position of the Commission who will not be liable for the use made of such information”.