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Organic egg production in Finland: management of animal welfare and food safety

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Abstract

In Finland, as in many other countries, the demand for organically produced eggs as well as the number of organic egg producers has increased. Even though organic poultry are given greater possibilities to species-specific behaviour, e.g. by allowing access to outdoors and by housing in free range-systems, maintenance of high welfare status is challenging. Commercial free range or organic egg production systems are not common in Finland but reports from free range and organic egg production systems in other countries have revealed some problems concerning animal welfare and food safety. A total of 20 out of 23 commercial organic layer farms (in excess of 80% of all commercial Finnish organic farms year 2003) took part in the ongoing research, which identifies risk factors and potential solutions for laying hen welfare and food safety. Data was collected during two farm visits by interviewing the producer, using a semi-structured interview guide, making environment and animal-based observations and collecting samples. The study report will be completed by the end 2005.

Keywords: organic laying hen, animal welfare, food safety, risk factors

Introduction

Consumers are increasingly interested in the safety and origin of their food and the ethical issues within the production chain. This has lead to a rapid increase of both free range and organic poultry production in many countries. The trend is strengthened by the current plans to phase out conventional battery cages for layer hens in the European Union by 2012. In Finland, the demand for organically produced eggs has increased, as well as the number of organic egg producers. Organic eggs are within the top three organic products in Finland, when measured as market shares. In 2003, the market share of organic eggs was 4.2% (Finfood Luomu, 2005), and there were 46 organic farms with organic laying hens (36% had >1,000 hens; 42% <100 hens). Between 2000 and 2004, the number of organic farms has increased by 18%, the number of organic laying hens by 156% and the number of hens/farm by 118%. In 2004, there were 53 organic farms in Finland, with a total of 74,418 organic layers (KTTK, 2005).

Even though organic poultry are given a greater possibility to species-specific behaviour, e.g. by allowing access to outdoors (at least between May and October in the Finnish organic

systems) and by rearing them in free range-systems, maintenance of high welfare status in organic poultry flocks is challenging. Feather pecking, foot problems, external parasites and poor utilisation of outdoor areas have been recognised as problems in organic layer systems (Lampkin, 1997; Berg, 2001; Kjilstra *et al*, 2003). Inexperience might cause imbalances in feed rationing due to the absence of synthetic amino acids and use of home-grown feed (Gordon & Clarke, 2002; Zollitsch & Baumung, 2004). Furthermore, birds with outdoor access have a potentially greater risk for exposure to bird or zoonotic human pathogens, such as salmonella, campylobacter and certain parasites than birds in indoor systems. Good stockmanship and experience of free range systems have been identified as key elements to a high welfare status in organic poultry systems (Bestman, 2001). Thus, organic egg production poses major challenges for producers in countries like Finland, where free range egg production is not common; where climatic conditions limit both outdoor access and building design; and where biosecurity and exclusion of zoonotic pathogens from the food chain has been one of the main aims of conventional egg production.
This paper describes preliminary findings from a project that was designed to assess welfare and food safety in Finnish organic egg production systems.

Materials and methods

A total of 20 out of 23 commercial organic layer farms (in excess of 80% of all commercial Finnish organic farms) took part in the research. One flock per farm was chosen and flocks were visited twice (19 farms in Aug-Oct of 2003 and 17 farms in March-Apr of 2004). Data were collected through observation and by interviewing the producer, using a semi-structured interview guide. Laying hen welfare was estimated using environment-based and animal-based methods. Environment-based measures included ANI 35L-2001 -laying hens (Bartussek, 2001), housing environment and litter moisture and animal-based measures hen scoring (20–50 hens/flock, all together 911 hens) (Gunnarsson *et al*, 1995), hen body weight and flock-level fear of humans. Fresh faecal samples were collected from the floor for analysis of campylobacter and salmonella bacteria (5-50 samples per farm) and for internal parasite identification (4-10 pooled samples per farm). Gastrointestinal parasite eggs and oocysts were studied by flotation. For the prevalence study of poultry red mites (Dermanyssys gallinae), six cardboard traps per henhouse were placed into the walls of a henhouse for 2-3 days as described by Höglund *et al*, (1995). In addition, 10 untreated eggs/flock were collected for campylobacter and salmonella studies. Altogether, 38 dead hens from 12 farms were examined pathologically through post mortem. Management practices, welfare measures and measures related to animal health and food safety will be analysed, using e.g. risk factor analysis and triangulation of data to identify farm-specific and overall risk factors for welfare and health status and carrier status of the flocks with regard to zoonotic bacteria.

Some preliminary results

The hen number at farms varied between 150 and 5,072, and 55% of farms had fewer than 1,000 hens/flock. Hens were not beak trimmed. The two most popular hen breeds were Lohmann white LSL (40% of flocks and 67% of hens in 2004) and Hy-Line Variety Brown (35% of flocks and 13% of hens). Mortality ranged from 0–3.9%/month between flocks (average 0.85%/month, median 0.5%/month).
In 2003 and 2004, there were 10 and 8 tame, 7 distant and 2 fearful flocks. In 2003, 16 flocks (567 hens) and, in 2004, 12 flocks (344 hens) were clinically scored. Ages of the scored hens were on average 47 (19–148) weeks and 53 (31-156) weeks, respectively. Over 90% of the hens were in lay. Feather status and skin status were, by and large, good. Moderate wear of feathers at back, wings and/or tail were seen in 1.4–16.9% (2003) and 2.3–29.4% (2004) of

scored hens and featherless areas were seen in 0.7–8.1% (2003) and 0–9,6% (2004) of scored hens on average. Pecks at the skin of back, wings, tail, belly and/or cloacca were found in 0.4–3% (2003) and 0.6–6.1% (2004) of the scored hens on average. Feather pecking and/or cannibalism were seen in three (2003) and two (2004) different flocks. The overall ANI score of single farms varied between 15.5 and 31 points and the average values were 24.8 points (2003) and 23.9 points (2004). The score was lower in the winter-spring period (mainly because of worse indoor air) than in the autumn 2003. Preliminary results suggest that the short outdoor period in Finland decreases the overall ANI score markedly.
Between 71 and 90% of the flocks were *Campylobacter* spp. positive, the results did not differ significantly between seasons. The most common species detected was C. *jejuni*. Two of the farms were campylobacter-negative, both in the autumn and the spring. No specific factors either in the environment or in the management of the animals could explain why the farms did not have campylobacter-positive animals. Campylobacter positive egg shell sample was detected once. Salmonellas were not detected either from faecal samples or eggs.
Only 0-10% or 0-15% of the farmers had recognized endoparasites or ectoparasites, respectively, in their flocks, but 42–77% or 48–90% of the flocks were *Nematoda* spp. positive or red mite positive, respectively. The post mortem results are biased, as only 60% of the farms sent some hens for post-mortem and 42% of the hens came from one farmer. However, red mites were detected on 58% of these farms sending hens for post mortem, which corresponds well with the trap results from all farms. A number of hens that had died due to cannibalism were diagnosed from 50% of these 12 farms.

Discussion

Flock sizes of Finnish organic layers are smaller than in many other countries. Feather pecking and cannibalism found during farm visits and mortality seem to be at a lower level than in some other investigations, even though the hens were not beak trimmed. The parasite and cannibalism (post mortem samples) results compare well with results found in free range/organic poultry in Denmark (Permin *et al*, 1999), back yard flocks or alternative systems in Sweden (Höglund *et al*, 1995), hens in alternative systems in the UK (Green *et al*, 2000) and organic laying hens in the Netherlands (Bestman & Wagenaar, 2003).
Campylobacter jejuni colonises commonly the intestines of wild birds and poultry. Our results showed that organic laying hens are more often colonized by campylobacters than broilers, as in certain Finnish studies approximately 4% of the broiler flocks were contaminated by campylobacters when studied at slaughter. Campylobacter colonization did not apparently lead to contamination of egg shells, as only one sample was positive of a total of 36 samples studied. *Campylobacter* on egg shell surface is not likely to survive, as it is very sensitive to dryness. These facts together indicate that the risk of transmission of campylobacters on eggs to consumers is small. Intestinal colonization by campylobacters may lead to contamination of meat at slaughter, as seen commonly in chickens. Meat of used organic hens is not commonly used as food, further decreasing the possibility of meat to transmit campylobacter infection to humans.

Conclusions so far

Further data analysis is in process. There seem to be comparable prevalences with other studies of organic or free range poultry. Parasites are common in organic layer flocks. Salmonella is rare in Finland and there are no public health risks with regard to salmonella or cambylobacters since spent hens are not eaten in Finland. More conclusions are expected after the analysis is completed.

References

Bartussek, H. (2001) Animal needs index for laying hens. ANI 35-L/2001 – laying hens. June 2001. Bal Gumpenstein. 30 pp.

Berg, C. (2001). Health and welfare in organic poultry production. Acta Veterinaria Scandinavica S95: 37-45.

Bestman, M. W. P. (2001). The role of management and housing in the prevention of feather pecking in laying hens. In: M. Hovi and M. Bouilhol (eds.) Human Animal relationship: stockmanship and housing in organic livestock systems. Proceedings of the 3rd NAHWOA Workshop, 77-88.

Bestman, M.W.P., and J.P. Wagenaar (2003). Farm level factors associated with feather pecking in organic laying hens. Livestock Production Science 80: 133-140.

Finfood Luomu (2005). Luomubarometri 4/2003 ja luomumyynti (Barometer and sale of organic products 4/2003).[online]. [cited 22.4.2005]. Available at: http://www.finfood.fi/.

Gordon, S.H. and D.R. Charles (2002). Niche and organic chicken products - their technology and scientific principles. Nottingham University Press, Nottingham, United Kingdom, 320 pp.

Green, L.E., K. Lewis, A. Kimpton and C.J. Nicol (2000). A cross sectional study of the prevalence of feather pecking in laying hens in alternative systems and its associations with management and disease. Veterinary Record 147: 233-238.

Gunnarsson, S., K. Odén, B. Algers, J. Svedberg and L. Keeling (1995). Poultry health and behaviour in a tiered system for loose housed layers. Report 35. Department of Animal Hygiene, Faculty of Veterinary Medicine, Swedish University of Agricultural Sciences, Skara, Sweden. 112pp.

Höglund, J., H. Nordenfors and A. Uggla (1995). Prevalence of the Poultry Red Mite, Dermanyssys gallinae, in Different Types of Production Systems for Egg Layers in Sweden. Poultry Science (1995) 74:1793-1798.

Kijlstra, A., M. Groot, J.v.d. Roest, D. Kasteel and I. Eijck (2003). Analysis of black holes in our knowledge concerning animal health in the organic food production chain. Wageningen UR, 55 pp.

KTTK (2004). Luomueläinmäärien yhteenveto 2003 – 2004 (Database of organic animal production). [online]. [cited 25.4.2005]. Available at: http://www.kttk.fi.

Lampkin, N., (ed.) (1997). Organic poultry production. Final Report to MAFF.

Permin, A., M. Bisgaard, F. Frandsen, M. Pearman, J. Kold, and P. Nansen (1999). Prevalence of gastrointestinal helminths in different poultry production systems. British Poultry Science (1999) 40:439-443.

Zollitzch, W. and R. Baumung (2004) Protein supply for organic poultry: options and shortcomings. In: M. Hovi, A. Sundrum and S. Padel (eds.) Organic livestock farming: potential and limitations of husbandry practice to secure animal health and welfare and food quality. Proceedings of the 2nd SAFO Workshop 25-27 March 2004, Witzenhausen, Germany; 153-159.

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