

## New Zealand Society of Animal Production online archive

This paper is from the New Zealand Society for Animal Production online archive. NZSAP holds a regular annual conference in June or July each year for the presentation of technical and applied topics in animal production. NZSAP plays an important role as a forum fostering research in all areas of animal production including production systems, nutrition, meat science, animal welfare, wool science, animal breeding and genetics.

An invitation is extended to all those involved in the field of animal production to apply for membership of the New Zealand Society of Animal Production at our website [www.nzsap.org.nz](http://www.nzsap.org.nz)

[View All Proceedings](#)

[Next Conference](#)

[Join NZSAP](#)

The New Zealand Society of Animal Production in publishing the conference proceedings is engaged in disseminating information, not rendering professional advice or services. The views expressed herein do not necessarily represent the views of the New Zealand Society of Animal Production and the New Zealand Society of Animal Production expressly disclaims any form of liability with respect to anything done or omitted to be done in reliance upon the contents of these proceedings.

This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](http://creativecommons.org/licenses/by-nc-nd/4.0/).



You are free to:

**Share**— copy and redistribute the material in any medium or format

Under the following terms:

**Attribution** — You must give [appropriate credit](#), provide a link to the license, and [indicate if changes were made](#). You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

**NonCommercial** — You may not use the material for [commercial purposes](#).

**NoDerivatives** — If you [remix, transform, or build upon](#) the material, you may not distribute the modified material.

<http://creativecommons.org.nz/licences/licences-explained/>

## The welfare status of egg-production in New Zealand

W. TEMPLE AND T.M. FOSTER

Department of Psychology, University of Waikato, Private Bag, Hamilton, New Zealand.

### ABSTRACT

Of all farm production practices, intensive systems come under public scrutiny most, and intensive egg-production is often a particular source of concern. Caged hens are seen as unacceptable in most European countries due to the density of housing, barrenness of environment and restriction of "most normal behaviour patterns". In New Zealand most egg-production systems involve practices which are being questioned overseas in terms of their welfare impact. This paper presents the results of a survey of some representative New Zealand farms in the light of public and scientific concerns for animal welfare. Currently there appears to be no obvious system likely to replace laying cages and guarantee good welfare. Pressure for change, however, seems likely.

**Keywords:** Egg-production, New Zealand, intensive housing, welfare, poultry.

This report is based on a survey of six farms. All were volunteers obtained through the Poultry Industry Association and were chosen to be representative of various common systems. They were not a random sample and might be expected to be "better" than other farms. All farmers were very co-operative and we thank them for their kindness and friendly welcome. On each farm we contacted the farmers, asked them some structured questions, and looked closely at a number of, randomly selected, hens and cages.

Most research and writing on the welfare and requirements of battery hens is European in origin. The UK's Farm Animal Welfare Council recognises five freedoms to consider in assessing the welfare of an animal in a husbandry system (Webster and Nicol, 1988). These are freedom from: hunger and thirst; thermal and physical discomfort; pain, injury and disease; fear and distress; and the freedom to exercise most normal patterns of behaviour. These "freedoms" form a basis for assessing potential risks to welfare. The productivity of a group or of an individual animal is not regarded as an index of welfare, except one of poor welfare when it is low.

### Space

Most egg production in N.Z. is done in units using standard (30 x 45 cm) laying cages in single tiers or, occasionally in two (or three) tiers. A few systems use the larger (50 x 50 cm) cages. Most standard cages are in sheds which are not fully closed and which use removable curtains to regulate ventilation and temperature. This is in contrast with some European practices which involve fully closed sheds and more tiers of laying cages. These standard cages have an area of 1350 cm<sup>2</sup> and give around 450 cm<sup>2</sup> per bird. (Note that this is the minimum recommended allowance at present). Space allowances in our sample were between 357 and 517 cm<sup>2</sup> per bird. The most common was 450 cm<sup>2</sup>. Hens use around 600 cm<sup>2</sup> to stand and move without touching their cage-mates, around 800 cm<sup>2</sup> to perform grooming movements and around

1500-1800 cm<sup>2</sup> to perform full wing-stretch (Stamp Dawkins and Hardie, 1989). A standard A4 page is around 624 cm<sup>2</sup>.

It is clear that the present systems employed in New Zealand do not allow the "expression of most normal patterns of behaviour" and would be judged to be as detrimental to welfare using the five freedoms. Reduced space is also considered to contribute to feather loss and lack of exercise to weaker leg bones (Gregory *et al.*, 1990).

### Feeding and waterers

Feeding regimes varied. Three were automatic (a chain system) and three used a degree of human involvement. Frequencies varied from once (most common) to nine times per day. All fed mash as the main diet. Most used the "standard" small cup waterer, usually shared between four to twelve birds. No serious welfare problems were apparent in the food and water access, although at the stocking densities involved it is usually necessary for a hen to move another hen in order to get access to water.

### Cage design and Maintenance

Floor slopes varied between 4 and 9 degrees (median 6 degrees). Most cages seem to be old, but not in bad repair. Around 5% of the total sampled showed some evidence of rusty/broken/repared wires. Most cages had only the centre section of the front as the opening section. Such cages have been suggested in U.K. research to contribute to broken bones when the hens are removed from the cages (Gregory and Wilkins, 1989). Modified cages with horizontal bar fronts which open fully are reported to improve access to food, and welfare on removal. It is reasonable to assume that overseas research data on bone breakage would apply to New Zealand. No cages had perches (suggested to improve leg-bone strength (Hughes and Appleby, 1989)) or "scratch" strips (shown to reduce over-long claw growth (Tauson, 1986)).

## Lighting and ventilation

All farms surveyed supplemented natural lighting with either incandescent or fluorescent lights, to extend daylight to around 16 hours. No farm used artificial heating but all varied air circulation by means of opening and closing various doors and curtains.

## Ammonia levels

The rates of dropping removal varied from once every two days to only when the hens were removed. Most were around two- to three- monthly. We were able to rate ammonia levels only on a subjective scale from none (36% of sites) through low (31%) and moderate (25%) and severe (8%). A judgement of "moderate" was a level which the surveying humans found irritating. The highest levels were generally encountered near the centres of large sheds with low frequencies of dropping removal.

## Mortality rates

On an annual basis mortalities ranged from 3% to 15%. The median was 9%. Although these figures are not unusual by world standards it seems that an annual mortality rate of around 10% would not be acceptable in most farming operations, nor would it be likely to be perceived as such by the general public. Post-mortems are not carried out unless there is an "epidemic".

## Foot and claw condition

The rates of observable foot injuries (best described as wart-like cracked or open calluses) ranged from 0% to 100% of birds. The average for each farm ranged from 33% to 92%. The overall median rate was 64%. These estimates were made by two observers who had to agree before a case of injury was recorded. They are, therefore, reasonably reliable although higher than expected. Other injuries were very much fewer with skin abrasions being the only other noticeable category (range 0% to 20%, median 4%). Foot condition is probably, at least partly, a result of the flooring material (wire) and the lack of regular movement. Hens' most preferred floor surfaces have more contact points with the feet than our cage floors provide (Hughes and Black, 1973).

Two observers looked at each hen in the sample and rated the length and degree of curl of the hens' claws. The percentages of individual hens with at least one curled claw ranged between 16% and 100% of the samples. The median was 100% (i.e. more than half the farms sampled had 100% of their hens with at least one curled claw). Claw lengths were estimated at around 2 cm in most cases. Excessive claw growth has been identified as relevant to reduced welfare, but the lengths found in our survey do not represent a cause for concern.

## Feather loss

This was judged by two observers on a subjective scale based on previously agreed diagrams of hens. The scale points, the range of each category found across all farms, and the medians of these were: no loss 5% to 40% (19%); low 3% to 27% (22%); moderate 16% to 77% (26%); severe 6% to

40% (10%); and extreme 0% to 35% (0%). To score in the last category the hen would have to have virtually no visible complete feathers. This was seen on only two farms. One farm had 40% of its hens scored as having no feather loss.

Feather-loss varied widely within our sample and is usually seen as a cause for welfare concern. It seems to occur partly as a result of abrasion and partly from feather-pecking by other hens. This feather-pecking is thought to be, essentially, re-directed exploratory pecking and is distinguished from the bouts of hen-hen pecking which are termed cannibalism and often lead to death. These latter are more common in large indoor housing systems (Hughes, 1990). Generally hens who had been longer in the cages showed more feather loss which seems logical but was not studied on a systematic basis.

## Beak and toe trimming

All farms had beak-trimmed hens. Five of six had the centre toe trimmed. Beak-trimming was mainly (5/6) done on the property at between five and seven days of age. Individuals were often concerned to report that their beak-trimming was "not severe". Toe trimming was reported to have been done by the hatchery in all cases it occurred. Both of these practices raise welfare questions and are coming under pressure for change in many European countries (Fraser and Broom, 1990)

Beak trimming has been shown to be accompanied by the presence of particular forms of neuroma which are thought to indicate chronic pain (Gentle *et al.*, 1990). To make some estimate of the degree of trimming two observers rated the amount trimmed on a five-point scale (low to severe) for between 50 and 70 randomly-chosen hens on each farm. Across all the farms the median percentage in the low category was 30%. At least one farm had 44% of its hens rated as severely trimmed.

Clearly the amount of beak trimmed can vary and is probably dependent on the skill of the operator. One farm's hens all scored in the lowest two of the above categories. One farm had no hens falling in the lowest category. Since we had, initially, expected that beak-trimming would have been done at the hatchery, we did not investigate how or specifically by whom it was done.

Trimming of the centre toe is not, as far as we can find out, practised commonly overseas. In New Zealand, centre toe trimming seems (reports) to be carried out routinely to avoid injury during the rearing, rather than laying, period. It is possible that some changes in early housing and rearing practices could render this unnecessary. The one farmer who did not have toe-trimmed hens reported no apparent problems.

## Individual hen inspection and egg collection

One advantage of laying-cage systems is that they allow identification and inspection of individual hens, mainly during egg-collection. In practice it may be unrealistic given the numbers of hens involved. Egg collection was mainly by hand (only one automatic system) and varied between once and three (most common) times per day. Health checking and decisions to contact veterinary or other services were made

mainly on the basis of increased mortality or sharply decreased production.

### Rearing

In most cases rearing is done on the property (i.e. the hens are purchased as day-olds). Practices seem to vary widely with numbers in each cage ranging from seventy to seven at different ages. Toe-trimming is reported to be necessary to avoid injury to other hens during this period. There appears to be no scientific research on the need for this and it is difficult to comment on the effectiveness of the practice. It is not clear why it is so wide-spread in New Zealand.

### General comments

There are strong suggestions (Appleby, 1991) that the barrenness of the laying cage contributes to many of the behaviour and welfare problems. Some researchers in both the U.K. and Australia are suggesting that the advantages of the small indoor cage (mainly identification and protection of the individual hen in a small group and hygiene/disease control) be retained through the production of modified (enriched) cages (e.g. Robertson *et al.*, 1989). These would be larger and would contain scratch and dust-bathing areas, perches, a nest-box and, possibly, material for general exploratory pecking. At the time of writing this, however, it is clear that such alternatives are not yet developed and would not necessarily be suitable in commercial practice. They would also cost more than the present systems for both plant and labour.

From the above it seems that if, say, some form of the proposed European standards of animal welfare were adopted, or imposed on us as suppliers of agricultural produce (albeit not eggs or poultry meat), then New Zealand would not be in a strong position to defend some of our present practices.

Historically we have tended to follow Europe's lead in many areas of social and legislative change. It is the opinion of the present authors that this may well be another.

### REFERENCES

- Appleby, M.C. 1990. *Do hens suffer in battery cages?: A Review of the Scientific Evidence commissioned by the Athene Trust*. Institute of Ecology and Resource management, University of Edinburgh: Edinburgh.
- Fraser, A.F.; Broom, D.M. 1990. *Farm animal behaviour and Welfare (3rd edition)*, Bailliere Tindall: London.
- Gentle, M.J.; Waddington, D.; Hunter, L.N.; Jones, B. 1990. Behavioural evidence for persistent pain following partial beak amputation in chickens. *Applied Animal Behaviour Science*, **27**, 149-157.
- Gregory, N.G.; Wilkins, L.J. 1989. Broken bones in domestic fowl: handling and processing damage in end-of-lay battery hens. *British Poultry Science*, **30**, 555-562.
- Gregory, N.G.; Wilkins, L.J.; Eleperuma, S.D.; Ballantyne, A.J.; Overfield, N.D. 1990. Broken bones in domestic fowls: effect of husbandry system and stunning method in end-of-lay hens. *British Poultry Science*, **31**, 59-69.
- Hughes, B.O. (1990) Welfare in alternative housing systems for laying hens. In: *Proceedings of the VIII European poultry conference*. Barcelona June 1990. pp. 186-195
- Hughes, B.O.; Appleby, M.C. 1989. Increase in bone strength of spent laying hens housed in modified cages. *The Veterinary Record*, May 6, 483-484.
- Hughes, B.O.; Black, A.J. 1973. The preference of domestic hens for different types of battery cage floor. *British Poultry Science*, **14**, 615-619.
- Robertson, E.S.; Appleby, M.C.; Hogarth, G.S.; Hughes, B.O. 1989. Modified cages for laying hens: a pilot trial. *Research and Development in Agriculture*, **6**, 107-114.
- Stamp Dawkins, M.; Hardie, S. 1989. Space needs of laying hens. *British Poultry Science*, **30**, 413-416
- Tauson, R. 1986. Avoiding excessive growth of claws in caged laying hens. *Acta Agric Scand*, **36**, 95-106.
- Webster, A.J.F.; Nicol, C.J. 1988. The case for welfare. *Cambridge Poultry conference, "Cages for the future"*, Fitzwilliam College: Cambridge, 11-21.