MORTALITY PATTERNS IN AUSTRALIAN AND IMPORTED LAYING HENS

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Summary

The mortality patterns in two Australian and four imported strains of egg layers, involving a total of over 3,500 birds, are presented. Commercial one-day-old pullets were obtained from hatcheries where they received routine vaccinations. Subsequently the birds were reared on a commercial farm near Tamworth, where they received typical commercial management. At 16–18 weeks of age, they were transferred to the University of New England and housed in five- or two-bird cages.

Mortalities from Marek's Disease and cannibalism complex were substantially higher in the imported strains. Mortality in the imported strains from cannibalism complex was significantly higher in five- than two-bird cages and the ranking of strains was influenced by housing system.

I. INTRODUCTION

The recent importation of laying strains from the northern hemisphere into Australia has led to a number of problems concerning bird livability. The imported strains, when vaccinated with conventional Australian Marek's vaccines, do not appear to be well protected against Marek's Disease (MD) and heavy losses have been reported in the field. A number of reasons have been put forward, including the presence of very velogenic strains of MD.

This report details a total mortality survey of two Australian and four imported strains of laying birds to 66 weeks of age under management conditions that are typical of many Australian poultry farms. The paper by Nolan et al. (1998) in these proceedings details the production and economic traits of this trial.

II. MATERIALS AND METHODS

The birds were hatched between 16 and 30 January 1996. All chickens were vaccinated at their hatcheries against MD and Infectious Bronchitis (IB) at one-day-old. They were reared in wire floored cages on a large commercial farm near Tamworth where they received a conventional chicken starter crumble diet to eight weeks of age, a crumbled grower diet from 8 to 18 weeks of age, and a crumbled pre-layer diet from 18 to 22 weeks of age. At three weeks of age, the birds were re-vaccinated against IB (A3 virus – in contact method) and at 14 weeks against Avian Encephalomyelitis and IB (Vic S – in contact method). The birds were beak trimmed at ten days of age and again at eight weeks of age.

The birds were moved when 17–18 weeks of age to Laureldale Poultry Farm, University of New England, where they were housed in single deck laying cages at either five birds per cage (modern cages, Shed 1) or two birds per cage (Californian cages, Shed 2). Shed 1 contained 440 birds in 88 cages (five birds/cage) of each of the Hy-Line CB, Isa Brown, Tegel Black and Hisex strains, while the Lohmann Brown and Hy-line Brown strains were represented by 480 birds each. Shed 2 had 132 birds per strain in two-bird cages. Birds that died were replaced up to 22 weeks of age.

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A macroscopic post mortem examination was made on all birds that died up to 66 weeks of age. Deaths were categorised according to the most obvious abnormality or lesion when examined. Features diagnostic for MD included growths involving the ovaries, spleen, kidneys, liver and heart muscle, as well as the typical thickening of the brachial and sciatic nerves. Hens dying from MD were almost invariably out of production.

Cumming (1974) suggested that cannibalism was closely associated with salpingitis/peritonitis, and Jordan and Pattison (1996) recently made the same suggestion. The conditions included in cannibalism/cannibalism complex are prolapse, vent peck, cannibalism, and salpingitis/peritonitis. These conditions can be described as follows:

a) **prolapse**, where the cloaca was everted, sometimes containing an unladen hard-shelled egg, the tissues engorged with blood and showing signs of pecking.
b) **vent-peck**, where the cloaca was usually damaged and contused with portions of the reproductive and/or digestive tract sometimes missing. Such birds are often anaemic.
c) **cannibalism**, where a portion of the body, usually the back and thighs had been eaten away.
d) **salpingitis** and peritonitis, where there were macroscopic signs of inflammation of the oviduct and/or the peritoneal cavity. This condition varies from acute to chronic and the lesions vary accordingly. In the acute cases, the ovary is active and the prominent lesion is marked venous congestion of the ovary and oviduct, which usually contains small (1–4 ml) flocules of white to yellowish pus. There may be similar flocules of pus in the peritoneal cavity as well. In the chronic form, the bird is generally emaciated, the ovary atrophied and the oviduct distended with concentric layers of inspissated pus. Hens may die showing symptoms varying from the acute to the chronic form.
e) **nephritis** – due to damage in the vent area occluding the terminal portion of the ureters.

Usually the birds in categories a, b and c were in full production, as indicated by their comb development and ovarian activity.

### III. RESULTS

Cumulative mortality from 18 to 66 weeks of age in the six strains housed in the two- or five-bird cages are shown in the three figures. MD mortality is shown in Figure 1, cannibalism complex mortality in Figure 2, and total mortality in Figure 3. As can be seen from the figures, the two categories of MD and cannibalism/cannibalism complex accounted for about 90% of the total mortalities.

As shown in Figure 1, losses from MD generally began early, and peaked around the 25–35 week period. MD losses were substantially higher in the imported than local strains with essentially similar mortality and ranking of the strains between the two housing systems.

The losses from cannibalism complex (Figure 2) tended to occur later, significant losses starting at about 25 weeks of age. Again, mortality from this cause was considerably higher in the imported than local strains. There was a difference between the two housing systems in the level and pattern of mortality from this cause, and in the relative ranking of the strains. Overall, cannibalism mortality was higher in the five-bird cages and continued to increase over the laying period compared to the two-bird cages, where mortality tended to plateau in all strains at about 40 weeks of age.

Within the imported strains, there was a marked change in ranking in the two housing systems, with the Lohmann birds showing the highest cannibalism-related mortality in the five-bird cages, but low to moderate absolute and relative mortality in the two-bird cages.
Figure 1  Cumulative Marek's Disease mortality (%) from 18 to 66 weeks of age in the six strains of layers housed in 2- or 5-bird cages.

Figure 2  Cumulative cannibalism complex mortality (%) from 18 to 66 weeks of age in the six strains of layers housed in 2- or 5-bird cages.
Overall, the total mortalities in the imported breeds were considerably higher than those recorded in the Australian strains, with somewhat higher mortalities occurring in the five- than two-bird cages, in some strains at least. (Figure 3)

**Figure 3** Cumulative total mortality (%) from 18 to 66 weeks of age in the six strains of layers housed in 2- or 5-bird cages

### IV. DISCUSSION

There was no evidence of very velogenic MD strains in this trial as the two Australian strains recorded less than 2% mortality from this condition.

The cannibalism mortality results suggest that husbandry procedures such as beak trimming and lighting in sheds, which appear to be adequate for Australian strains, may need to be modified to accommodate the generally increased susceptibility of the imported strains.

### REFERENCES

