

Evaluation of Furnished Colony Cage Systems for the New Zealand Egg Market 2007 – 2010: Key Findings Summary

The following key findings are a summary of the main results and observations reported in the final study report of the MAF Sustainable Farming Fund project. This study was undertaken by the Egg Producers Federation to evaluate the feasibility of enriched colony cages for the New Zealand egg market.

For more information and background to this study refer to the Project Summary available at http://www.eggfarmers.co.nz/uploads/B1F6Z_Project_Summary.pdf.

Explanation of abbreviations used in this summary:

BT = Beak trimmed

NBT = Non-beak trimmed

FCC = Furnished colony cage (colony system, enriched)

CC = Conventional cage

FR = Free range

Egg Production/Rate of lay

- Both breeds of brown layer produced in line with breeder standards.
- BT hens had a higher rate of lay than NBT hens.
- Minimal differences between rates of lay for hens in FCC versus CC.
- The overall findings were similar to European research findings.

Feed Intake & Feed Conversion

- Comparable intake and conversion for hens in FCC versus CC.
- Scratch feed was used at each feed time (5 feeds).
- Using scratch feed to encourage foraging and dust bathing behaviours did not have a negative impact on feed conversion.
- These results are also similar to European research findings.

Mortality

- Lower mortality in BT hens than NBT hens.
- FCC hens showed a lower rate of mortality post 42wks than CC hens.
- FR hens showed the highest mortality.
- Coccidiosis (E tenella) outbreak in Flock 1 was mainly one bank of NBT hens linked and to scratch mats, so risk of this disease in naïve hens is a possibility. Changing the scratch mats at replacement time minimized this risk.
- The significance of the Coccidiosis in FCC hens was that it occurred in the top tiers, and in CC Coccidiosis outbreaks are related to access to the manure belts so it is never seen in top tiers.

Physical Health & Welfare – Bodyweight

- No differences.

Physical Health & Welfare – Tauson Feather Score

- Based on a scoring system of 4 = Well Feathered and 1 = No Feather Cover assessed at 6 different areas of the hen's body at 30 and 60wks of age. Highest score anyone hen could = 24.
- 98% of all hens in both flocks at 30wks had scores of at least 21 indicating good feathering.
- At 60wks, differences between groups was wider, and only 10% of hens had a score of 21 or more.
- FR hens had highest score at 60wks, then FCC BT hens, then FCC NBT and CC NBT.
- NBT hens showed equally poor feathers, whether housed in FCC or CC.

Physical Health & Welfare – Claw Length

- At 30wks only 1% of all hens assessed had a claw length of more than 2cm (7 / 717 hens, and 6 of these were housed in CC, and 1 FCC BT)
- 60% of CC hens had claws longer than 2cm at 60wks, compared to only 2% of FCC BT.
- FR hens (flock 2 only) had less than 0.5% long claws at 60wks.
- The FCC system incorporates claw shorteners located on the feed baffle plate which the hens' inadvertently use at feed times and helps to reduce claw length.

Physical Health & Welfare – Broken Claws

- FR hens had significantly lower proportion of hens with broken claws at 60wks compared to 29% in FCC BT, 31% in FCC NBT & 30% in CC NBT. The FR claws are too worn down to break.

Physical Health & Welfare – Toe Pad Lesions

- Scoring system was 4 = No Lesion and 1 = Significant Lesion.
- Findings in this study showed very good foot condition in contrast to European research.
- The higher level of lesions in the first flock of FCC BT at 30wks, which decreased by 60wks, we think may have been due to prominent bolt heads securing the perches and damaging the hens' toes. There was a similar level of reduction in lesions in the CC hens where bolt fastenings were not present.

Physical Health & Welfare – Keel Bone Deformity

- Assessed by palpation at 30 and 60wks of age. A score of 4 = No deformity 2 = Significant Deformity.
- Keel bone deformity decreased slightly from 30 to 60wks of age, but there were no significant differences between the groups.
- In Flock 2 at 60wks, 17% of the FR hens assessed had a keel bone deformity of less than 4, an average of 9.5% for the FCC hens and 7% for the CC hens.
- UK researchers suggested that keel deformities occur after the hens are 45wks of age.

Physical Health & Welfare – Body Wounds

- Body wounds in all groups were virtually non-existent at both 30 and 60wks of age.

End of Flock Dissections – Keel Deformity

- A higher incidence of deformities was found in all 3 housing groups during dissection versus palpation at 60wks, but these could have occurred during the last 15wks of the hens' lives.
- Our findings were not statistically different between groups and very much lower than European findings.

End of Flock Dissections – Old Bone Fractures

- CC hens showed the lowest level of old fractures for both flocks of the keel and furculum at 11% and 7% (Keel + Furculum) respectively.
- FCC (BT+NBT) showed level of breaks for keel and furculum combined of 20% for both flocks.
- FR hens showed the highest levels at 26% for Flock 1 and 28.4% for Flock 2 (included 5% new breaks).
- UK researchers in 2010 also found higher levels in FR and barn hens.
- NZ results are very much lower than the UK 2004 study results, which reported old keel and furculum breaks of between 50-78% from FR and barn flocks.

End of Flock Dissections – Bone Ash

- Similar levels of bone ash were recorded for both flocks with the FR birds having the highest activity, the FCC hens intermediate and lowest in CC hens.

- Average of groups for Flocks 1 and 2 showed 54% for FR hens, 48% for FCC hens and 44% for CC hens.
- The greater mobility and provision of perches for the FCC hens is thought to improve their bone mineralization.

Egg Quality

- No statistically differences between the groups with regards to shell faults.
- When all treatment groups considered together, showed significantly lower Hough unit scores in CC than either of the FCC groups.
- FR scores were not significantly different to any of the other 3 groups.

Faucal Corticosterone

- This measure provides an indicator of stress levels in hens.
- CC hens had the highest levels, FCC combined (BT + NBT) were intermediate and FR the lowest.
- FCC BT levels were comparable to FR levels.
- FCC BT hens had significantly lower levels than the NBT hens.

Behavioural Observations – Bird Distribution

- Carried out observations at two age periods 40 and 50wks.
- Findings showed hens spent 40-50% of their time on the floor during the day.
- There was a consistent use of space across the BT and NBT hens, and across the age groups.
- Perch usage during the day was a consistent 20-25% across all times and treatments (at night this can be expected to increase with almost all hens using the perches – informal observations and video footage).
- Perches were less used in the morning because hens were laying at that time.
- Hens spent 10-15% of their time using or preparing to use the scratch mats, and time in or around this area generally increased during the day as nesting behaviour fell.
- NBT hens tended to spend more time at the feeder versus BT hens, but not necessarily feeding. There is anecdotal evidence from Bristol University that putting their heads through to the feeder lowers possibility of being pecked.

Behavioural Observations – Direct & Video

- The direct observations showed similar patterns of behaviour across daytime periods and beak treatments about circa 25 specific occurrences recorded during the 30min observation period.
- Observations implied that the hens spent much of their time sitting or standing doing very little.
- Absence of an observer in front of the hens during the video observations resulted in almost a doubling of the number of observations (e.g. comfort behaviours, made on the section of the colony being videoed).
- Video showed a greater occurrence of preening and this largely accounted for the increase in activity between direct and video.
- BT hen behaviour was more benign, there were gentler feather pecks recorded with these hens than NBT.
- BT hens did more preening across most observation periods an indication of improved welfare.
- Hens were observed to use the scratch mat more for foraging than dust bathing.
- The amount of aggressive behaviour shown by hens was limited amounting to between 0% and 12% of the total average 25 behavioural occurrences recorded for each 30min period.
- Overall behaviour observations show that the hens do make use of the nesting, perching & foraging facilities in FCC.