

## **Role of shelter belts in free range systems in reducing the need for beak trimming**

### Introduction

Due to animal welfare concerns cage systems are under increasing pressure, which has led to an increase in alternative systems, such as free range (Appleby, 2004; Arthur, 2008; Wegrzyn, 2008). Free range production systems allow birds to express a wider range of natural behaviours and therefore satisfy most of the birds' behavioural needs (Tauson, 2005). However, free range systems also have some problems. Increased pecking problems are seen in free range systems compared to cages, as there are a larger number of birds in close proximity interacting with each other (Fossum, et al., 2009).

Beak trimming, which is currently the main method for preventing feather pecking and cannibalism is a welfare issue (Glatz, 2000; Bolhuis, et al., 2009). When the practice is not performed correctly the bird can experience acute and chronic pain in the beak stump and a loss of sensory input (Lunam, 2005). Currently a number of European countries where beak trimming is still practiced are working towards an EU Welfare Directive by legislating for a ban on beak trimming by January 1, 2011 (Tauson, 2005). This has resulted in the search for alternatives to beak trimming to reduce the incidence of severe feather pecking and cannibalism, especially as free range systems continue to become a more common production system.

In free range layer systems only a small percentage of birds (as low as 9%) use the outdoor range (Hegelund, et al., 2005; Zeltner and Maurer, 2009). The birds that do range stay close to the house increasing the stocking density (Zeltner and Hirt, 2003; Hegelund,

et al., 2005; Jones, et al., 2007). Increased stocking density is a factor that contributes to an increased frequency of feather pecking and cannibalism in chickens (Nicol, et al., 1999; Savory, et al., 1999). Encouraging birds to range in an enriched environment will lower the density of birds within the house, and allow the birds to express a wider range of behaviours in the range (Hegelund, et al., 2005). It has been found that when more birds use the outdoor range there is a reduction in severe feather pecking (Green, et al., 2000; Bestman and Wagenaar, 2003) and there is a positive correlation between plumage condition and use of the outdoor area by hens (Bestman and Wagenaar, 2003; Mahboub, et al., 2004).

Improving the attractiveness of the range for birds is an important aspect to investigate. Currently many range areas are just fenced open fields with hardly any cover. This does not allow the hen the opportunity to seek shelter from weather or predators, or make the free range area stimulating for the birds to use (Dawkins, et al., 2003; Hegelund, et al., 2005). Studies have shown that there is a positive correlation between the presence of cover and number and dispersion of poultry on a range (Dawkins, et al., 2003; Zeltner and Hirt, 2003; Hegelund, et al., 2005; Zeltner and Hirt, 2008). Tree cover provides dry areas for dust bathing, encourages ranging by protecting birds from predators and provides shade from the sun (Dawkins, et al., 2003; Jones, et al., 2007).

There is currently little information on the use of environmental enrichment to encourage birds to range under Australian conditions. Since local conditions may influence the results of adding environmental enrichment in the range, there is a need for evaluation

under Australian conditions. This study therefore examined if the ranging behaviour of hens in a free range system could be increased by providing shelterbelts (groups of varying sizes of trees and shrubs) in the range environment. It was expected that by providing shelter to the range environment it would attract more hens outside and contribute to a reduction in feather pecking and improved plumage condition.

### Progress and Findings

Measure	Progress	Outcome
Production: <ul style="list-style-type: none"> <li>• Egg production (daily)</li> <li>• Feed intake (weekly)</li> <li>• Egg weights (once a week)</li> <li>• Body weights (fortnightly)</li> <li>• Feather scores</li> </ul>	Complete	No difference between the two treatments (no shelter belt in range versus shelterbelt in range)
Stress: <ul style="list-style-type: none"> <li>• Corticosterone               <ul style="list-style-type: none"> <li>○ Plasma</li> <li>○ Egg (albumen)</li> </ul> </li> <li>• Heterophil:Lymphocyte ratio</li> </ul>	Complete	No difference between the two treatments
Behaviour: <ul style="list-style-type: none"> <li>• No &amp; distribution of birds(&lt;10m/&gt;10m)</li> <li>• Feather pecking</li> <li>• Aggressive behaviour</li> <li>• Dust-bathing</li> <li>• Foraging</li> <li>• Running</li> <li>• Comfort behaviours (eg. Preening)</li> </ul>	Complete	Birds in the shelterbelt treatment showed a: <ul style="list-style-type: none"> <li>• Significant increase in % of birds using range during the day</li> <li>• Increased foraging behaviour in the range</li> </ul> For both treatments birds: <ul style="list-style-type: none"> <li>• Prefer to range near sheltered areas (i.e. trees, and fence lines)</li> </ul>

#### Future Work and Recommendations:

Future studies are required to determine the ability of shelterbelts to encourage birds to use the outside range throughout a whole year and in a commercial sized flock. Previous studies have found shade and forage encourage birds to range (Glatz, 2009; Glatz, et al., personal communication) and further study combining shade, forage, and shelter belts should also be performed. Although conclusions about reducing feather pecking could not be made, the results clearly demonstrate the need to provide structuring to a range environment to encourage birds to range outside.

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