

Research Summary

Understanding how infrared beak treatment affects the beak tissue and the healing response of brown and white feathered layer pullets

Purpose of the Study

In commercial egg production, hens are beak treated to control cannibalism and feather pecking. A more recent method of beak treatment, infrared beak treatment (IRBT) uses an infrared light to damage the tissue in the beak tip, stopping further regeneration of the beak. The treated beak tissue gradually sloughs off 1 to 2 weeks post-treatment, allowing the bird time to adapt to the change in beak shape. Beaks treated using IRBT demonstrate complete healing as soon as 4 weeks post-treatment, as evident by re-epithelialisation and re-innervation; however, the healing process in the days immediately following IRBT is still not fully understood.

Despite the research that has been conducted on the impact of IRBT on the production and welfare of egg production pullets, gaps in the scientific literature regarding the effects of IRBT on beak histology and healing still exist. Therefore, the objectives of this study were to understand the histology of IRBT-treated versus untreated beaks during early life and investigate how IRBT affects the beak length and healing response of Lohmann Brown-Lite and Lohmann LSL-Lite pullets.

Methods

100 Lohmann Brown-Lite and 100 Lohmann LSL-Lite chicks were assigned to 1 of 2 beak treatments: infrared beak treated or sham untreated control (Figure 1). Chicks were housed in cages from 0 to 21 days of age. Data collected included presence of beak sloughing, beak

length, and beak histology. Histology slides were examined and scored on a scale of 0 to 4, with 0 indicating no lesions and 4 indicating severe inflammation.

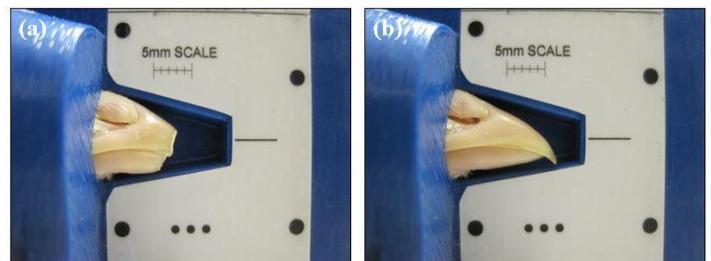


Figure 1. Infrared treated beak (left) and sham untreated control beak (right)

Findings

Beak sloughing. Sloughing of the treated beak tissue began at 10 days of age and was complete by 20 days of age.

Beak length and growth. As expected, beak treated pullets had shorter top and bottom beak lengths than control pullets once sloughing started. Over the 21 day experiment, beak treated pullets had less overall beak growth compared to the control pullets. This indicates that IRBT was effective at inhibiting beak re-growth. This is important because it prevents having to re-trim birds later in life and it ensures that the beak does not grow back enough that birds become more successful at damaging the skin and feathers of other birds.

Histology. At 1 day post-treatment, all beaks showed necrosis (tissue death), edema (accumulation of fluid), and hemorrhage (Figure 2). By 5 days post-treatment, regeneration of the

epithelial layer was visible (Figure 3) and by 9 d, bone healing and the formation of new blood vessels were occurring. At 17 days post-treatment, the epithelial layer was completely healed but the necrotic beak tip still had not sloughed (Figure 4). Bacteria was present within the necrotic tissue but more importantly, it was not present within the healed tissue. At 21 days post-treatment, all treated Lohmann Brown-Lite pullets had completely healed beaks, while some Lohmann LSL-Lite pullets still only showed moderate healing.

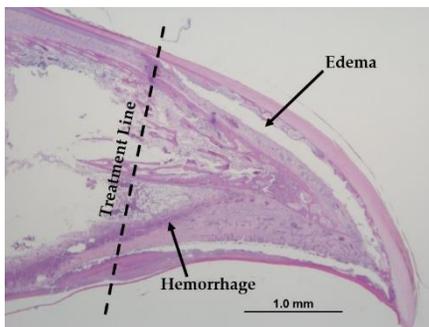


Figure 2. Treated beak at 1 day post-treatment.

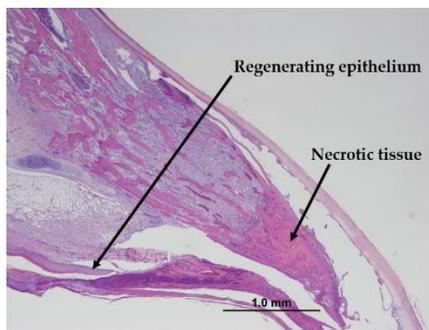


Figure 3. Treated beak at 5 days post-treatment.

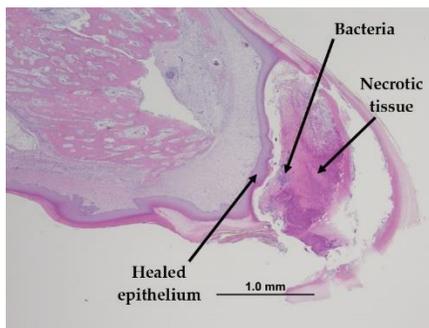
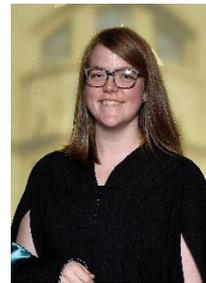


Figure 4. Completely healed treated beak at 17 days.

Conclusions

Overall, the results demonstrate that IRBT was effective at reducing beak length and growth post-treatment. The histology results suggest that regeneration of the epithelial layer began as soon as 5 days post-treatment and that appropriate healing responses occurred in both strains. There was no evidence IRBT resulted in the formation of neuromas, which are associated with chronic pain.

About Us



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Note: This project is currently under peer review for publication.