LASER BEAK TRIMMING

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Summary

An ophthalmic laser was used to beak trim chickens. The laser beam cut through the outer layers of keratin, but the tip of the premaxillary bone could not be fully severed. For a number of birds, incomplete cuts were made on the beak. Subsequently, a green laser and CO₂ laser were tested. The CO₂ laser with a 1 sec pulse, 50-micron spot size and power rating of 10W was the most effective laser in cutting a beak sample indicating potential to use lasers for beak trimming.

RESULTS AND DISCUSSION

Given the continuing welfare scrutiny of using a hot blade to cut the beak, attempts have been made to develop alternative methods of beak trimming. Alternative methods include cold blade trimming, arc trimming, robotic trimming, chemical trimming and infrared trimming (Glatz, 2004). Cost of lasers is falling and studies were undertaken to examine the potential of using lasers for beak trimming.

An ophthalmic laser (1.5W, 4 sec pulse, 50-micron spot size) cut through an upper beak sample from a dead chicken. Two passes of the laser beam were required to complete the cut due to insufficient power in the laser beam. Studies with 5-day-old chickens established the spot size to enable coagulation of the tissue and prevent bleeding. When a 50-micron spot size was used for 2 sec there was insufficient energy density in beam to cause coagulation and the beak began to bleed (N=4). When the spot size was increased to 200 microns with a cutting time of 2 sec, no bleeding was observed (N=3) indicating the 200-micron spot size was effective in sealing the wound.

The laser was able to cut through the outer layers of keratin, but could not cut tip of the premaxillary bone of day-old (N=10) or 5 day-old chicks (N=10) with only one exception. The beam was passed across the bony tip numerous times for a number of birds from the dorsal, ventral and lateral position without success. The cuts that were made to the beak looked clean and straight. No problems were observed with healing of the beak stump. The lack of success in being able to cut the tip of the premaxillary bone was considered to be due to the lack of power in the laser. A green and CO₂ laser were tested. The CO₂ laser with a 1 sec pulse, 50-micron spot size and power rating of 10W was the most effective laser in cutting a beak sample.

This work has shown that there is potential to use lasers for beak trimming. The study demonstrated the spot size required to cauterise the beak, and the power to cut the beak. Further work is now required to develop a prototype laser beak-trimming machine with automatic measurement and laser trimming of the beak. The laser beak trimming technology is likely to improve precision of beak trimming, reduce cannibalism and chronic pain in birds.

REFERENCES


1 SARDI, Pig and Poultry Institute, Roseworthy, SA 5371 - Australia