Novel Mammalian Fibroblast Cell Culture Media Technique for Ultraviolet Cell Reduction

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Carcass bruising from horns costs the cattle industry $10 million a year (Anderson, 2012). It is vital to develop safe and cost effective advancements in dehorning procedures. Removal of horns raises risk of discomfort and pain to the animal; utilizing ultraviolet (UV) light as treatment can be effective when compared to current methods. The initial goal of this investigation was to develop a novel media and technique to effectively culture horn-producing cells for in vitro UV experimentation. Three media variations failed due to lack of cell reproduction and presence of fungal or bacterial colonies. Horn-producing cells demonstrated an average increase of 31.39% in a novel media mixture of 20 ml Ham's F12, 2% Amphotericin B from Streptomyces sp., and 1% penicillin. A UV prototype, developed in previous research was improved to guarantee isolated UV treatment of horn producing cells. Varying times were adapted for ultraviolet treatment. Horn-producing cells were cultured in this media and evaluated by cell count using ImageJ analysis of digital images. Statistical analysis found significant relationships between cell death or reduction and run time of the UV lamp. As light run time increased, mitosis decreased. Ultraviolet light substantially reduced mitosis as compared to controls without UV exposure. Prototype design and implementation were effective for isolated treatment of cells in novel media.