

Vaccine to Provide Horn Fly Protection for Large Animals

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Reference: Horn Fly Vaccine

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Reference

Cupp, et al. "Evaluation of a recombinant salivary gland protein (thrombostasin) as a vaccine candidate to disrupt blood-feeding by horn flies." *Vaccine* 2004; **22**:2285-2297.

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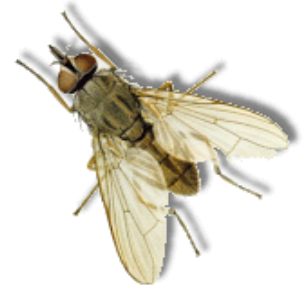
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Overview

This invention is centered around a vaccine based on proteins originally isolated from the salivary glands of the blood-feeding horn fly. This vaccine has the potential to reduce the economic impact of horn flies on the livestock industry via a reduction in the effectiveness of the fly's feeding process.

Advantages

- Confers protection on cattle and potentially other livestock and large animals from horn fly feeding by interfering with the insect's ability to feed
- Reduced feeding also interferes with egg production, and thus overall fly populations
- Close association with fundamentally important proteins should preclude emergence of resistance
- Proteins can be produced in cell culture



Description

Since their introduction into the United States in the late 19th century, horn flies have spread rapidly throughout the Western hemisphere, with horn fly parasitism of cattle being observed in most countries of Central and South America. The economic impact of horn fly parasitism – largely due to reduced beef and milk production – in North America alone approaches one billion dollars per year. Because of the growing resistance of horn flies to all classes of insecticides, new methods are needed to prevent the economic losses associated with blood feeding by large populations of these pests.

Auburn's approach uses anti-thrombin proteins identified from horn fly saliva as target antigens for vaccination as a means of disrupting horn fly feeding. Such proteins prevent the blood of the host from clotting, allowing for longer and easier feeding by the fly. Host antibodies resulting from vaccination diminish the proteins' anti-thrombin functions, allowing the blood to clot more easily and making feeding more difficult. In addition to reducing feeding, such an approach also produces physiological changes in the horn flies, including lowered egg production.

This vaccine has been tested in both rabbits and cattle, reducing fly egg development and reducing feeding by as much as 40%. Additional testing is planned on new formulations to further improve protection.

Status

- Six issued patents including three in U.S. ([6,451,992](#); 6,927,279; 7,211,652) and one each in Mexico, China and Australia; numerous other U.S. and foreign applications are pending.
- This technology has been tested in cattle, showing decreases in horn fly blood uptake, egg production and adult survival. Additional work is scheduled to further improve protection.

Licensing Opportunities

- This technology is available for exclusive or non-exclusive licensing
- Development opportunities include funded research or further animal trials