

Enhanced Jet Injector for Cattle

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OBJECTIVE:

Meat damage caused by injections into the muscle of food animals leads to significant economic losses, because the affected tissue must be removed prior to sale.

Subcutaneous injections can prevent meat damage, but subcutaneous injections with needles often cause injection site lesions through inadvertent injection into the muscle. Additional needle problems include user fatigue and broken needles becoming embedded in the tissue.



The objective of this grant was to develop a fully portable, high-speed, easy-to-use device that assures delivery of injectates to an accurate, predictable depth while eliminating standard long needles. The device is intended to reduce injection site damage while maintaining or increasing the speed of injection procedures.

SOLUTION:

Extensive research was required to establish the appropriate pressure and nozzle geometry to consistently deliver injectates to the proper depth in cattle. In addition, the device needed to deliver an array of volumes, ranging from 0.5 ml to 5 ml. DCI designed and fabricated prototype devices that met the volume requirements and allowed for varying pressure and nozzle geometry. Laboratory and animal tests were carried out, and user input was collected to assist in the continuing device design.

RESULTS:

The DCI prototypes were used in live animal tests during Phase II of the program to compare vaccine efficacy and meat damage for the injector versus needle and syringe delivery. The results indicated that the injector provided titers that were at least as high as those provided by needle and syringe for six different disease agents. Also, the injector caused less meat damage and resulting economic loss than needle and syringe. The injector design was refined to become the **LectraVet®** device.