

## **Innovative Electrostatic Spraying of Antimicrobials in the Poultry Industry - Achieving a more Complete and Efficient Coverage**

Electrostatic Spraying Systems (ESS) began marketing sprayers and spray equipment to the agriculture industry over 20 years ago utilizing the patented “electrostatic” nozzle which was invented at the University of Georgia. Although the technology was created with agriculture applications in mind, in more recent years the benefits derived from using an electrostatic sprayer have expanded rapidly into the general food production and food safety fields.

From the beginning, the nozzle has applied even and efficient coatings to all surfaces of live plants in fields, greenhouses and orchards. More recently, this same innovative technology has been found to provide the same consistent coverage when applying antimicrobials, disinfectants, and sanitizers to meat, eggs, produce, and food processing equipment and facilities.

Independent studies have demonstrated that the effectiveness of the ESS electrostatic nozzle is equal to, or better than, conventional spray applicators while using only 50% to 75% of the actual chemical or solution. Researchers have been able to demonstrate a 7-fold increase in spray deposition over conventional application methods achieving a 1.6 to 24-fold increase in deposition.

This is due to the fact that processing equipment surfaces and plant surfaces such as walls have a native positive charge. As high pressure air and solution are forced through a small aperture in the electrostatic spray nozzle, the air shears the solution into tiny droplets (approximately 40 microns in diameter). These droplets are then exposed to an electrical charge as they exit the nozzle head.

This transfers a negative charge to the antimicrobial particle which then has a strong attraction to the surfaces in the area, such as meat, eggs, processing equipment, or transportation vehicles.

With the recent devastating outbreak of the avian influenza within the poultry industry, ESS has been called upon to build various new types of spray equipment to fight the spread of this destructive virus, through the application of disinfectants and sanitizers to equipment, facilities and vehicles. Shortly, there may even be sprayers to apply antimicrobials directly onto live birds.

Because the deposition of the sanitizer to the surface being treated is so much more efficient, as compared to conventional sprayers, much less antimicrobial or sanitizer is required to achieve the same bacterial disinfection rate when compared to commonly used commercial foggers or sprayers.

Results from studies have indicated that electrostatic applications were extremely effective for eliminating populations of Salmonella, Listeria, Staphylococcus, E. coli, and Pseudomonas on food contact surfaces when applied using electrostatic spraying. This method should prove to be excellent for treatment of clean food contact surfaces as a means of sanitizing them prior to operation. Additionally, very little sanitizer was required to accomplish such bacterial reductions. Generally, surfaces are deluged with disinfectants and sanitizers, costing the companies more money to sanitize.