WASTE MANAGEMENT PROGRAMS
COLLEGE OF AGRICULTURE & LIFE SCIENCES

NC STATE UNIVERSITY

Animal and Poultry Waste Management Center

A candidate technology of the North Carolina Agreements Project: Development of Environmentally Superior Technologies per Agreements Between the Attorney General of North Carolina and Smithfield Foods, Premium Standard Farms and Frontline Farmers

Belt System for Manure Removal

This process is designed to separate liquid and solid wastes as they are deposited inside a swine production facility. The centerpiece of the system is a conveyor belt that is positioned below the pens in which pigs are housed. The flooring of the pens is slatted so that waste drops through the floor to the belt below. The belt is positioned at an angle so that liquid waste flows off it to a gutter positioned alongside the belt. Solid waste remains on the belt, which carries the solid waste to the end of the pens, where it may be collected.

Belt System

The belt system is one of two such systems being evaluated as part of the Smithfield/Premium Standard Farms/Frontline Farmers agreements. This system was designed by Gannett-Fleming, Inc., an international consulting engineering and planning firm. The system is designed so that it may be installed in existing swine houses.

The system is being evaluated a North Carolina State University's Lake Wheeler Road Field Laboratory, where a full-scale belt system has been constructed. The belt system is being evaluated in conjunction with another Smithfield/Premium Standard Farms/Frontline Farmers candidate technology, a system that uses black soldier fly larvae to convert pig manure solids into a value-added product that may be used for oil or as an animal feed ingredient. The belt system is being used to supply the manure solids for the solider fly project.

Belt System for Manure Removal (continued)

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Why Separate Solid and Liquid Waste

The lagoon and spray field waste treatment technology used on most swine farms in North Carolina not only mixes solid and liquid wastes but dilutes the waste with water. The barns in which pigs are raised usually have concrete floors with slots in them. Swine waste drops through the slots to a pit below. From there, the waste is flushed with water into a lagoon.

That's an efficient way to deal with the waste if you don't want to move it very far. However, the weight and volume of the diluted waste makes movement difficult and costly. And being able to move waste is often necessary if the waste is to be processed to produce value-added products. That's why systems that separate the solid and liquid portions of the waste stream are part of many of the technologies being evaluated as part of the Smithfield/Premium Standard Farms/Frontline Farmers agreements. The solid portion of the waste stream particularly is a candidate for processing to produce value-added products.

Separating the solid and liquid portions of the waste stream may also help deal with odor and ammonia emission problems. Both odor and ammonia are produced by the action of fecal microbes on the manure constituents. If urine and solid waste are separated, and the feces dried, odor and ammonia emissions should be reduced dramatically.