Assessment of the Biosecurity of Animal Mortality Size Reduction Using Horizontal Grinders Prior to On-Farm Composting

Paul Lemieux | *U.S. Environmental Protection Agency*

There is currently an outbreak of African Swine Fever Virus (ASFv) in Asia, a hemorrhagic fever virus, which only affects pigs. The U.S. Department of Agriculture (USDA), several states, and the pork industry are concerned that if ASFv were to spread to the U.S. it could cause significant damage to the $40B pork industry and create a public health and environmental risk if the large numbers of pig carcasses resulting from the disease and subsequent response are not quickly managed. Estimated disposal capacity that may be needed is on the order of 3,000,000 lb/day.

On-farm management of infected carcasses is preferred over offsite transport to landfill or incineration to help prevent the spread of the virus to other premises that might occur while carcasses are being transported. On-farm composting is one preferred method of on-farm carcass management since it kills the virus, produces a potentially useful by-product and has been successfully used in past responses to High Pathogenic Avian Influenza (HPAI) outbreaks. Unlike with poultry, however, whole-swine composting requires 6-12 months, resulting in the farm being quarantined for up to a year. Grinding of the animal carcasses into smaller pieces along with vegetative debris as a carbon source enables pig carcasses to fully compost in approximately one month and provides a means to perform on-farm disposal without having to transport infected material over public roadways. Unfortunately, traditional industrial-scale animal carcass grinding equipment is not widely available and therefore impractical for emergency response.

An alternative means to achieve the required throughput for carcass disposal operations is to utilize “horizontal grinders” – large commercial woodchippers that are typically used for vegetative debris management. These units are readily available around the country and could be rapidly deployed for swine carcass grinding. Unfortunately, these devices have never been used for processing animal carcasses, and their operational effectiveness has not been evaluated, nor has the potential for aerosol release of virus particles from the process been assessed.

This presentation describes a series of tests to operationally assess the biosecurity of using horizontal grinders to perform size reduction on swine mortalities. Porcine DNA was measured in coarse particle fractions and fine particle fractions, to estimate an emission factor from horizontal grinders, which was then utilized with air modeling to estimate atmospheric transport of potentially infectious particles. The results from these tests will be used to help USDA/APHIS develop standard operating procedures for these operations.