Wastewater Management at an Animal Protein Rendering Facility

The rendering industry serves a vital purpose in recycling animal proteins in regions having a large animal production industry. Removing inedible products from the agricultural waste stream and producing nutritious animal feed ingredients for animal feed and pet food use is an important allied industry function for Alabama’s poultry industry. The rendering process does, however, use large amounts of water and wastewater treatment is an important part of any rendering operation. American Protein’s operation at Hanceville, Alabama produces pet food and feed grade animal protein products from coproducts of poultry operations in the region. Hanceville’s wastewater treatment facility consists of a pretreatment facility, an anaerobic lagoon, two aerobic lagoons, a four-stage activated sludge system, tertiary filtration and ultraviolet disinfection prior to water release into the mulberry fork of the warrior river. The pretreatment process includes a surge wet well, a fine mesh drum screen, two DAF units and a flow equalization basin. After the first DAF treatment, a three-part polymer program (polyamine, cationic, anionic) is used for further solids removal. All solids and flocculated fats are directed back into the plant for protein and fat recovery (400,000 lb/week). Wastewater from the second DAF is pumped into the covered anaerobic lagoon for biological treatment (biogas harvested to heat boilers). From there, waste water is pumped into aerobic lagoon and first reactor of the activated sludge processing. Four reactors comprise the activated sludge process; two each anoxic (denitrification) and aerobic (nitrification/BOD reduction). After passing the fourth reactor, a clarifier removes final solids. Waste sludge is pumped into a lagoon and is land applied periodically. Clarifier effluent flows into a tertiary filtration disk and through an ultraviolet disinfection unit prior to discharge (400,000 gal/d). Wastewater ammonia concentrations are reduced from 2,500 mg/L to less than 0.5 mg/L at discharge. Water reuse rate is high in this system, with an inflow of 900,000 gal/d (2/3 condensate) and a recycling of 6 million gal/d. Extensive water reuse and removal of the high waste load generated are hallmarks of this award-winning waste management project.

Presenter:
Joseph Hess
hessjos@auburn.edu
Auburn University Poultry Science Department

Co-authors:
Joseph Hess¹, William Dozier¹, Jason Spann², and Bradley Thomas²
¹Auburn University Poultry Science Dept.
²American Proteins, Hanceville, AL