HY-LINE INTERNATIONAL

DANIEL JENSEN
CIVIL/ENVIRONMENTAL ENGINEERING, IOWA STATE UNIVERSITY

DALLAS CENTER

COMPANY BACKGROUND

Hy-Line International is a poultry company that specializes in genetics. Hy-Line brand laying hens produce 44 percent of the world's eggs and 85 percent of the nation's white eggs at locations worldwide. Regionally, Hy-Line employs approximately 150 people in Dallas County and has hundreds of other locations nationally and internationally. The facilities are categorized into three main areas of production; hatchery, research farms and cooperator farms. In 2011, Hy-Line in Dallas Center shipped more than 3.6 million live female chicks, 540,000 live male chicks and millions of hatching eggs.

PROJECT BACKGROUND

Hy-Line generates a variety of wastes associated with poultry production, including hatchery waste, whole eggs, liquid eggs, spent hens, solid manure and liquid manure slurry. Current waste management procedures include rendering, field application, incineration, feed additive production, composting and landfilling. In this 24-week project, the intern is re-evaluating the current organic waste management practices in order to minimize costs and produce environmental benefits.

INCENTIVES TO CHANGE

The goal of the internship project is to cut disposal costs by 50 percent and convert wastes to value-added products that can be used locally. These products could help neighboring farmers and greatly reduce the costs associated with Hy-Line's organic waste.

RESULTS

The intern first established an organic waste baseline to analyze the volume of waste produced and how it is managed. This baseline was then used to evaluate the benefits of various alternatives.

Anaerobic Digester: The intern recommended that an anaerobic digester be installed at the facility. Anaerobic digestion is the decomposition of organic materials in the absence of oxygen. It would allow for a closed-loop disposal plan for all of the company's organic waste. In addition to reducing costs, a digester would produce biogas. The biogas could be used to power a 225 kW generator that, in turn, could significantly reduce Hy-Line's energy bills. A digester would also produce liquid fertilizer and digestate (solid soil amendment). These products are less harmful to the environment than direct application of raw manure to farmland and could be sold to provide additional economic benefit.

As required by the company, a professional third-party feasibility study will be done to confirm the project's feasibility. Other opportunities for organic waste reduction that involve less capital investment than a digester include in-house composting, third party composting and processing the organic waste into livestock feed.

Whole eggs: A recent regulation set by the U.S. Food and Drug Administration requires new standards regarding storage temperature of eggs sold for human consumption. A change in storage temperature at the facility would affect the hatchability of the eggs so millions of the company's whole eggs will now have to be disposed of. The intern identified a compost facility and a nutrient recycling company willing to take the eggs at no charge. This practice is expected to save the company $40,000 in landfill fees and divert 883 tons of special waste from the landfill annually.

Lighting: The intern is investigating the potential energy savings associated with an LED lighting retrofit. Testing is underway to determine if the use of LED lighting produces adverse affects on the birds' health or production. If test results are favorable, the project could significantly reduce energy costs for lighting in the barns housing the layer hens.

Other Projects: The intern has identified additional opportunities to reduce energy usage and divert waste from landfills. Projects include the use of an infrared camera to determine the efficiency of large egg coolers and to develop a municipal solid waste recycling and reduction plan.