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**Major:** Environmental Science and Resource Management  
**School:** University of Washington  
**Business:** Wilcox Farms  
**Industry:** Food and Beverage – Chicken Egg Production (NAICS 112310)  
**WASI Project:** Solid waste reduction and recycling



## Company Description

Wilcox Farms is a family-owned and -operated farm based in Roy, Washington, that manufactures egg products. Wilcox Farms is dedicated to providing the highest quality eggs and raising happy, healthy hens. Through this mission and commitment to sustainable agriculture, they've developed a trustworthy and socially responsible brand image. Wilcox Farms follows the Certified Humane standards and offers free range, pasture raised, and certified organic eggs and egg products.

## Incentives for Change

Wilcox Farms' dedication to the livelihoods of their hens extends to preservation of the environment. They follow water reclamation and conservation guidelines and are certified salmon safe. Wilcox Farms are participants in Stewardship Partners, protecting wildlife that reside in the Nisqually River that runs directly through their property. Their core values include transparency, integrity, and humane practices. They value their chickens, employees, and the ecosystem where they operate.

As part of their commitment to sustainable agriculture, Wilcox Farms saw an opportunity to reduce levels of total nitrogen discharged into groundwater. Wilcox Farms believed reducing the amount of liquid egg waste discharged would significantly contribute to this reduction. Wilcox Farms also wanted to pursue alternate disposal options for the fiber and corrugated cardboard waste stream. In addressing these two waste streams, Wilcox also anticipated an increase in resource efficiency, maximizing product output while minimizing labor and reducing costs.

## Project Description

This project targeted liquid egg waste, fiber egg flats, and corrugated cardboard waste streams produced at Wilcox Farms. The liquid egg waste discharges to their onsite wastewater lagoon, and all fiber egg flats and corrugated cardboard are shipped to the municipality waste refuse center. This project was a step towards achieving Department of Ecology and Wilcox Farms sustainable agriculture goals. Over the course of the project, Wilcox Farms successfully implemented a procedure where inedible egg is redirected to the manure pile, and clean fiber flats are returned to the current fiber egg carton supplier for recycling.

The WASI intern project focused on generating alternative disposal methods for inedible liquid egg discharge, fiber flats, and corrugated cardboard waste streams. This included research and working out logistics for collection, separation, storage, and transport.

## Liquid egg waste

“Inedible” eggs from the current breaker plant process was a significant source of loss, and the liquid egg waste is easy to capture and transport. The addition of the inedible liquid waste did not adversely affect the quality of the manure, which is sold as a soil fertilizer to the chicken feed provider. The inedible eggs are captured from the screw press into large tote containers. The liquid is then spread over the manure using a vacuum truck.

## Fiber flats and corrugated cardboard

Egg fiber flats used in the hard boil plant remained clean after eggs were unloaded. The intern helped identify a current Wilcox Farms carton supplier that could recycle this clean fiber. Recycling of the clean fiber was cost effective and met the cleanliness requirements for beneficial reuse and recycling. The clean egg fiber flats could be used as insulation or filler material in insulating foams in other industries, including the automobile and construction industry.

Egg cartons coming from the breaker plant are typically too dirty to be recycled. Wilcox Farms is looking into whether this dirty fiber can be added to the onsite manure compost. Alternate waste management options were considered, but Wilcox Farms did not select any of the options because they were not cost effective.

## Results

By adding the inedible egg to the manure, approximately 12,819 pounds of total nitrogen will be diverted from the wastewater lagoon each year. Recycling the clean fiber flats and cardboard could divert nearly 500,000 pounds of recyclable material from the landfill annually. With these pollution prevention programs in progress, an additional 399,200 pounds of material could be composted, saving over \$31,000 a year in disposal costs.

**Table 1. Estimated results from applying inedible egg waste to manure**

Liquid egg waste (lbs/week)	Liquid egg waste (lbs/year)	Liquid egg waste (tons/year)	Total nitrogen from liquid egg (lb/ton)	Total nitrogen diverted to manure (lbs/year)
13,200	686,400	343.2	37.35	12,819

**Table 2. Estimated results from recycling clean fiber and corrugated cardboard**

Cost to implement (\$/week)	Savings (\$/week)	Annual Savings (\$/year)	Annual Solid Waste Reductions (lbs/year)
600	1,527	48,223	499,200

Table 3. Projected results from applying dirty fiber to manure

Cost to implement (\$/week)	Savings (\$/week)	Annual Savings (\$/year)	Annual Solid Waste Reductions (lbs/year)
223	827	31,462	399,360

## Recommendations

- Consider transitioning from fiber flats to plastic flats, which can be cleaned and reused multiple times.
- Continue to find cost-effective alternatives to the landfill for the dirty fiber, including adding to the manure.

