General Mills Inc., Chanhassen Bakeries and Foodservice Plant: *A Case Study*

DfE

By redesigning one of its food products and optimizing the related manufacturing processes on one production line, General Mills saves more than $760,000 and reduces 640,000 pounds of ingredient waste annually. In this case study, learn how the company is using what they learned to reduce waste and save money across all of its production lines.

Production line employees receive customized training to optimize operations.

Background

The General Mills Inc., Chanhassen Bakeries and Foodservice Plant, is a leading producer of baked and unbaked food products. The company recognizes that changes made upfront during the design of products and related production processes provide the greatest opportunities for cost savings and preventing waste. Employee involvement, consultation, and training are highly valued assets for continual improvements at the plant.

Through a Minnesota Office of Environmental Assistance grant, with assistance from a consulting firm, the plant implemented a project to optimize product design and related production processes to reduce wastes and production costs while maintaining product quality. The focus of the project was Line 21, an unbaked product production line identified through initial data analysis as having significant opportunities for waste reduction and related cost savings.

Process and Product Opportunities

Review of material usage data for production Line 21 indicated elevated waste generation in the sheeting, make-up table, and packing areas. Root causes were identified as dough temperature, product and line feasibility (compatibility of equipment with product), employee training and communication, and production line maintenance. To optimize ingredient use and minimize production waste:

- Line feasibility studies were undertaken and three unbaked products were sent to reevaluation, reformulation (redesign), or movement to different production lines. A significant change was made to the design of one product.
- Production line and product-specific curriculum and training were developed with assistance from employees who were identified as being experts in certain areas of production. This increased employee knowledge, waste reduction awareness, and communication pathways. The result was a decrease in

variations in production operations. Prior to the project, each shift was recalibrating or adjusting settings, which caused inconsistency in operations and elevated waste generation.

At employees' suggestion, equipment enhancements were made to prevent product waste:

- Guide plates were added to the center and sides of conveyer belts to prevent any product from falling off the edge of the conveyer during packaging.
- Sloping of cake products is now prevented through improvements made to the vertical and horizontal guide mechanisms for the cake pans as they are filled with dough and guided toward the ovens.
- Plans are in place to prevent "tails" from misplaced batter found between cupcake paper and pan forms causing cupcakes to stick, resulting in wasted product.
- Photos contrasting good vs. poor quality products are posted beside some production lines to minimize disposal of products misjudged as being unusable.
- Line maintenance was assessed and rescheduled to improve equipment performance. As a result, inspection of the cooling system, then repair of an ethylene glycol blockage, immediately corrected a dough temperature problem. Conveyer belt adjustments were scheduled more frequently.

Investment in this comprehensive approach of analyzing waste data, optimizing design and processes, and training employees had immediate cost benefits.

Project Results

Product and process engineers for the plant are now using design and process guidelines to integrate efficient use of materials and waste prevention upfront. The company continues to implement a detailed waste-tracking database to provide information from each area of the production line. This is being further developed beyond ingredient usage, finished product, and packaging waste measurements to include calculation of production efficiencies. Such analysis is key to identifying root causes of waste generation. Observation, interviews, training, and auditing procedures continue to support appropriate employee knowledge and implementation. The result is a 40 percent reduction (640,000 pounds annually) in ingredient waste on Line 21, with continued reductions expected.

The work project is currently being expanded plant-wide as the "Strive for Five" program to include all production lines over the next five years. General Mills estimates that the annual plant-wide savings from this program will be nearly $4.8 million for a reduction of more than 4.2 million pounds of waste. Cost savings come from reductions in the amount of ingredients used, energy use, labor, and waste disposal costs.

Additional Information

More information about design for the environment (DfE) and waste reduction can be found at on the web:

www.moea.state.mn.us/p2/dfe.cfm