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# ANDERSON ERICKSON DAIRY - SHRINK REDUCTION



DES MOINES

## COMPANY PROFILE:

Anderson Erickson (AE) Dairy, located in Des Moines, Iowa, is a renowned dairy company that has been providing premium dairy products since its inception. With a rich history dating back to 1930, AE Dairy has become a household name in the region, known for its commitment to quality and freshness. The company prides itself on its locally sourced milk from Iowa farms, ensuring that its products are of the highest standards. With approximately 375 employees working at some capacity 24 hours per day, AE Dairy processes a variety of milk products, sour cream dips, yogurts, ice cream mixes, cottage cheeses, and various seasonal products like eggnog, orange juice, and lemonade.



## PROJECT BACKGROUND

At AE Dairy, the intern focused on assessing and recommending opportunities for improvement within the production process. On average, AE Dairy receives three quarters of a million pounds of

milk a day which is then processed, packaged, and stored in a cooler. The difference between the amount of raw milk received versus the amount of finished milk product to the cooler is tracked in pounds as milk loss. The company sought to identify the points of milk loss within the production process and develop solutions.

## INCENTIVES TO CHANGE

AE Dairy is highly motivated to reduce milk loss in its production process. By minimizing waste, it not only demonstrates its commitment to sustainability and environmental responsibility but also improves its overall operational efficiency. Through the implementation of advanced technologies and continuous process optimization, AE Dairy aims to ensure that every drop of milk is maximized for production, reducing costs and contributing to a more sustainable dairy industry. This proactive approach not only benefits the company's bottom line but also aligns with its dedication to delivering top-quality dairy products while minimizing its environmental footprint.

## RESULTS:

An in-depth analysis identified the main loss points within the production process. This baseline assessment provided documentation on exactly where and what milk loss occurred, and why the loss was occurring. Loss points identified by the

intern included points of product changeover and product line flushing, overfill of milk jugs, and improper filler bowl height. In the recommendations that follow, solutions were developed for reducing milk loss in some of these identified loss points.

**Install Air Blows:** When switching butterfat percentages of milk on the pasteurizing side of production, the first step is clearing the prior butterfat blend from the product line before starting a new product. A positive displacement pump uses water to clear the remaining milk in the line and pumps this product/water mix to a drain. Installing air blowers that use sterile compressed air to clear the product lines will allow for the recovery of the remaining milk in the lines. Installation entails clamping the air blow and HEPA filter to a product line and updating programming controls to insure a thorough clearing of the line. Maintenance staff and the on-site electrician plan to have the air blowers on pasteurizing lines operating by September 2023.

**Update Purge Cycle of Carton Filler:** When starting a new product on the carton filler, it is necessary to clean the filler bowl and valves with a food-safe cleaning solution. After the cleaning cycle, the operator will purge all the spent cleaning solution from the filler, and then run another purge through the valves using product until the lines are deemed clear.



By testing the total solids and butterfat of the product at each purge cycle, it was determined that the product purge cycles can be reduced by at least one cycle, reducing the amount of milk loss generated by this process. The plant is in the process of implementing a one cycle reduction. Further testing on subsequent reductions will be required before full implementation can occur.

**Recovery Tank for Half Pint Fillers:** When switching between products on the filler machines, it is necessary to clear the finished product out of the line by pumping in the new product. A mixture of both products will be purged from the filler and collected in cans to be reprocessed. Any part of the product mixture that is not collected will be lost. This collection process takes the operator 20 minutes of production time and requires lifting 300 pounds. Alternatively, the clean-in-place tank below the fillers can be retrofitted to become a recovery tank to capture this product mixture and pump it directly to the reprocess tank. This change will save 150,000 pounds of milk annually, and reduce operator time spent manually recovering milk from the lines. It will also make the recovery process

much easier on the operators by eliminating the heavy lifting requirements. To implement this recommendation, 3D sketches of the lines and retrofitting will be required.

**Blow Mold Preventative Maintenance:** AE Dairy produces its own gallon and half-gallon milk jugs, creating millions of plastic jugs per year with extrusion blow mold machines. Extrusion blow mold processes can be temperamental. Close monitoring of the molds, plastic mixes, and heating and cooling of the machines is required to ensure jugs are produced within the target weight tolerance. If a jug is underweight, its side walls will expand, or bloat, when filled with milk, resulting in overfilling of the jug. To ensure consistent fill volumes, additional preventative maintenance measures and inspections can be implemented to ensure optimal jug weights. Conducting weekly blow mold inspections and checks of the equipment's heating and hydraulic systems will ensure optimal performance. It will also increase the lifespan of the equipment and minimize downtime. The maintenance team will work with the operators to create a plan of daily and weekly tasks to improve blow mold operations.



**ENVIRONMENTAL AND ECONOMIC SAVINGS TABLE**

PROJECT	ANNUAL COST SAVINGS	ANNUAL ENVIRONMENTAL RESULTS	STATUS
INSTALL AIR BLOWS	\$88,222	489,492 lbs. milk	IMPLEMENTED
UPDATE PURGE CYCLE OF CARTON FILLER	\$20,800	4,160 gallons dairy product	IN PROGRESS
RECOVERY TANK FOR HALF PINT FILLERS	\$33,000	149,806 lbs. milk labor	RECOMMENDED
BLOW MOLD PREVENTATIVE MAINTENANCE	\$24,186	134,193 lbs. milk	RECOMMENDED

