



Food Manufacturing - Productivity Improvement

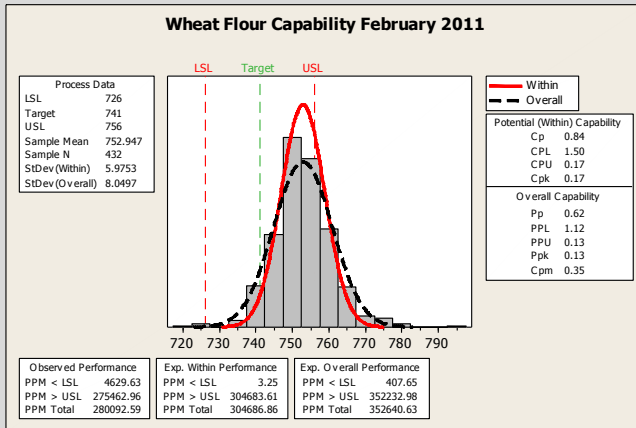
A six month improvement project increases cracker production, reduces scrap, and results in an annual savings of \$2.75M

Improvement Initiative

Cracker production at an industrial bakery was performing ten percent below the standard; making it difficult to keep pace with customer demand and resulting in excess overtime cost.

Targeted areas of investigation included:

- Capability of ingredient delivery systems
- Audit of the work methods to ensure consistency with current standard work
- Identify best practices
- Audit of the measurement systems
- Review of the preventative maintenance practices and frequencies
- Pareto analysis of the scrap and downtime

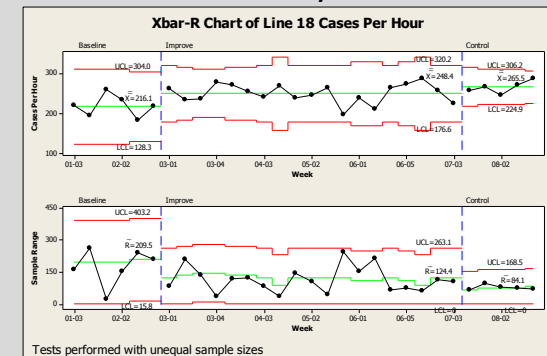


Improvements

- Corrected the flour delivery equipment capability issues detected during MSAs
- Updated the standard work based on the identified best practices
- Modified the post-oven lane conveyors to reduce scrap, downtime and rework
- Added andon lights and poka-yoke system for controlling laytime in the mix room
- Modified equipment PMs to sustain the improvement

Breakthrough Results

- The average number of cases produced each hour is increased from 216.1 to 265.5
- The cases per hour variance is reduced by 81%
- The improvements produce an annual savings of \$2.75M





Food Manufacturing – Startup Losses Reduced

Using TPM Focused Improvement tools, startup losses at the largest bakery in the world are reduced by 28 percent in only 60 days producing an annual savings of \$1.3M

Improvement Initiative

Poor execution of the process startup was costing the client over \$5.25 million dollars a year.

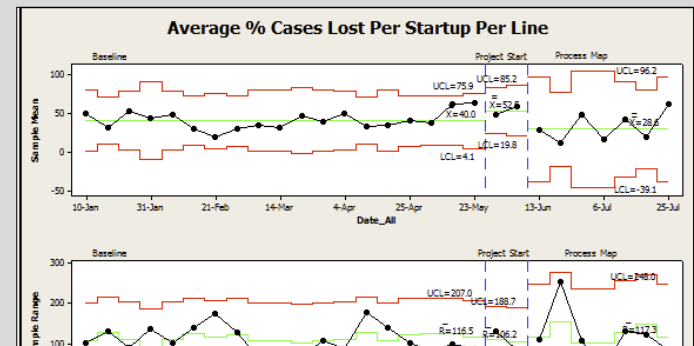
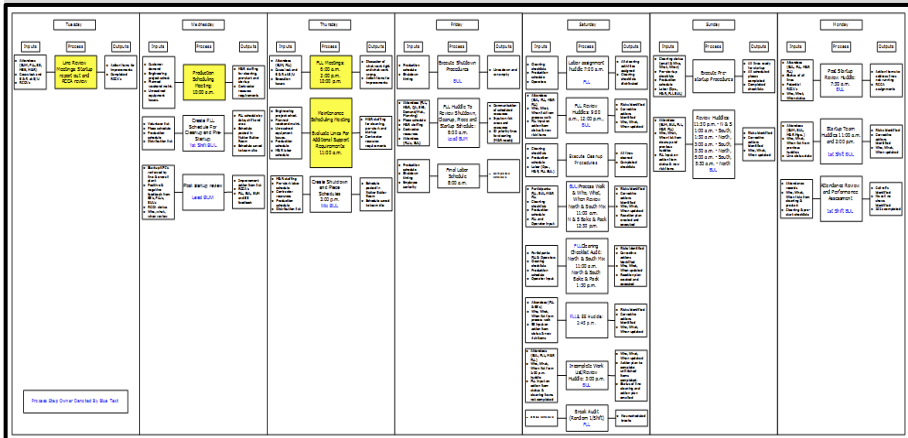
Analysis showed that the startup issues stemmed from inconsistent coordination of the information and resources required to execute the startup.

Focused Improvement tools were applied across Sanitation, Quality, Production, and Management to create a detailed startup and shut down Management System.

Improvements

- Process Mapping – Process Mapping was used to determine what needed to be done and when
- Standard Work – The best practices were standardized and detailed instructions, checklists, and training guides were created
- Program Management – All management levels were trained on the new process and review meetings for process compliance were instituted
- Project Continuation — Cross functional teams were implemented to continue the improving processes

Breakthrough Results



Average Cases Lost, per Line, per start up was reduced by 28%!



Food Manufacturing – Weight Variation

Test for equal variance identifies the source of weight variation that was costing a bakery \$2M annually in material variance

Improvement Initiative

Excessive weight variation at an industrial bakery forced the company to target product weights above the stated label weight in order to comply with the Department of Commerce regulations. This resulted in an annual material variance of \$2M.

Targeted areas of investigation included:

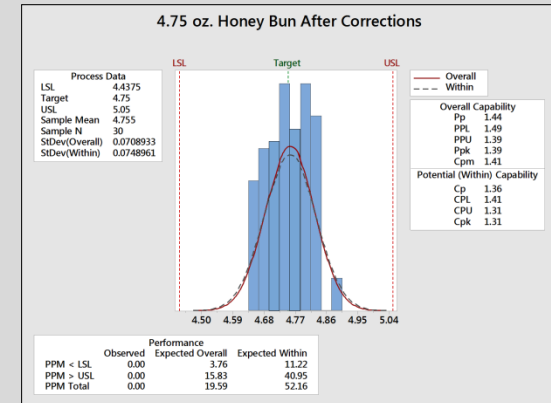
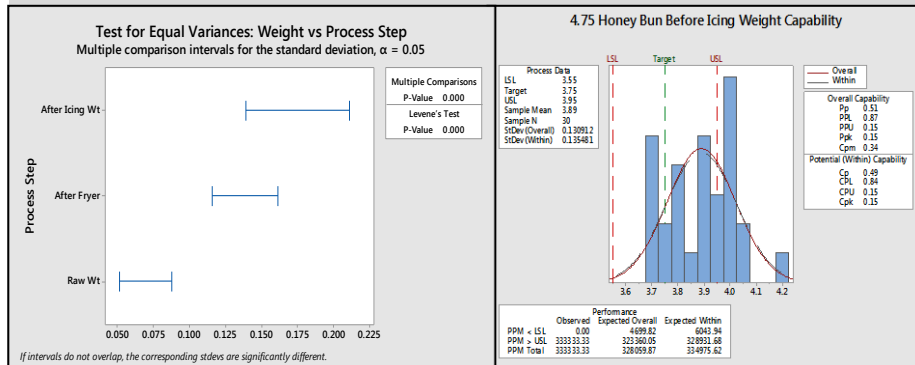
- Capability of ingredient delivery systems
- Measurement Systems Analysis of the weight and temperature measurement systems
- Identification of the best process setup
- Detailed analysis of weight variation at critical process points

Improvements

- Corrected the fryer oil temperature control and measurement systems
- Updated the process setup sheets with the optimum oil temperature settings
- Modified the weight charting method to provide a binary signal of when to adjust the weight
- Modified equipment PMs to check, and tune if needed, the fryer PID temperature controllers

Breakthrough Results

- The weight variance is reduced by 75.6%
- The targeted product weight now matches the label weight





Food Manufacturing – Variation Reduction

Six sigma tools are employed to identify process inputs impacting the location and variation of the crust X and Y dimensions

Improvement Initiative

Variation in the pizza crust dimensions have a significant impact on downstream processes. In addition to the obvious efficiency and quality losses, the variation in the dimensions must be accommodated with packaging large enough to fit crusts that are 3 sigma above the average diameter. This reduces the number of pizzas on a pallet and increases shipping costs by \$11MM annually.

The project objective was to improve the X and Y dimensional capability by analyzing all aspects of the baking process from mixing and proofing through pressing and measurement. The investigation included:

- Measurement System Analysis – MSA
- Historical dimensional performance
- Ingredient COA analysis for correlation to X and Y dimensions
- Ingredient delivery to mixer capability analysis
- Proof room temperature and humidity capability
- Dough ball handling evaluation
- Impact of press parameters on X and Y dimensions

Improvements

- Identified and corrected source of vision system variation
- Improved the consistency of the dough delivery to the presses and the positioner dwell time
- Corrected out of spec proof room temperature and humidity performance
- Identified and corrected over delivery of flour to the mixer (from 21.1 lbs. to 0 lbs.)

Breakthrough Results

- Measurement system error reduced by 52.6%
- Cpm increased by 51.5%

