

# Site Review of Product and Process Yields (Bega Cheese Project #1)

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## Tatura Milk Industries (TMI) Limited



TMI Limited was founded in 1907 and started by producing 100 tonnes of butter per annum. It currently processes 80,000 tonnes of dairy products per annum while sourcing milk from the Goulburn Valley region. Over 60% of the products are exported to Asia-Pacific and Europe. TMI Limited formed a strategic alliance with Bega Cheese Limited in 2007 to synergize in areas such as marketing and product manufacturing. They then merged in 2012, making TMI Limited a wholly owned subsidiary of Bega Cheese Limited. Bega Cheese Limited became an ASX listed company in 2011. In the 2013/14 financial year, the Bega group had a combined revenue of \$1 billion with \$405 million from the TMI site.

## Objectives

- Construct detailed Process Flow Diagrams (PFDs) for processes on site
- Identify process improvement opportunities across site
- Construct dynamic yield calculators

## Experience

- Team Experience

Worked closely as a group to achieve project objectives. Weekly (sometimes daily) meetings were called for to touch base with other members. Team members helped one another based on individual strengths.

- Work Experience

Staff at TMI were helpful as they spared their time to ease acclimatization into a new environment while providing the resources to help understand the dairy industry. It was quickly established that the fastest way to get any information was to call or meet up with the relevant person. The team gained a deep appreciation for the dairy industry at the end of the project. Finally, lasting work relationships were forged and references obtained for future job applications.

## Challenges

- Learning the intricacies of the dairy industry in a short time to gain the technical knowledge to allow the objectives to be completed
- Body clock had to quickly adapt to changing working times to allow for sample collection
- Unforeseen delays or shut down during production made planning for sample collection challenging

## Overall Process Diagram

### Inputs:

- Milk
- Other ingredients



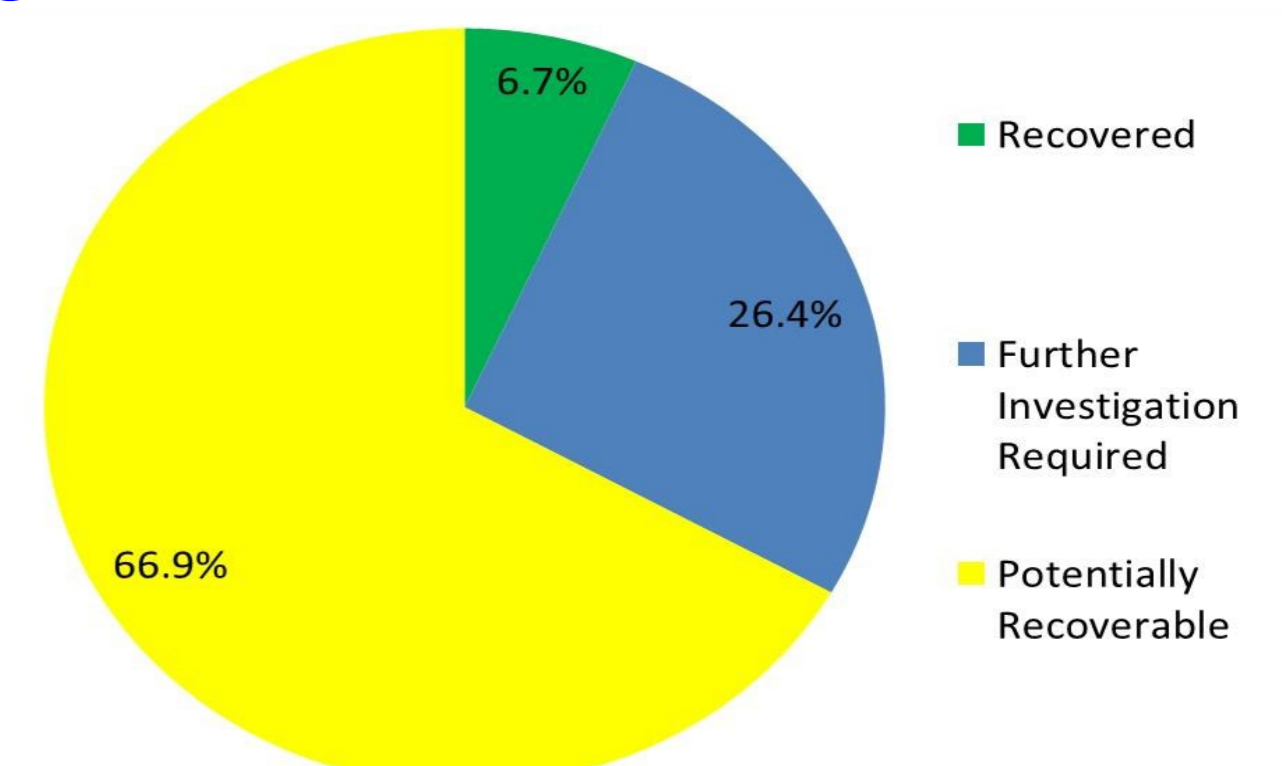
### Outputs:

- Milk powders
- Nutritional powders
- Life stage powders
- Bioactives
- Cream cheese

- The site obtains raw ingredients from farmers and other businesses
- These then enter the various unit operations, such as a spray dryer, and turns the inputs into milk powders, nutritional powders, life stage powders, bioactives and cream cheese.
- One example is the production of skim milk powder. The raw milk enters the site via tanker bays and are the passed through a separator which splits the milk into cream and skim milk. The skim milk is then pasteurized to destroy the microorganisms which may cause disease or reduced quality of the final product. After this process, the pasteurized skim milk is then evaporated to remove a portion of the moisture. The evaporation process is a mild process with a low energy penalty. Upon evaporation, the liquid is then spray dried to turn it into a long shelf-life powder. The powder is then packaged into different bags depending on the customer's requirements. Samples are regularly taken for the purpose of quality assurance and control to ensure that only the highest quality products are sold to the consumers.

## Project and Learning Outcomes

- Comprehensive PFDs were constructed for seven processes in the plant
- More than 80 opportunities were identified and quantified
  - ◆ Figure to the right shows the percentages for the total identified opportunities
- An action plan was formulated to capitalize on the opportunities that were discovered
- Dynamic yield calculators were constructed for five processes in the plant to predict and calculate yields



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A BEGA CHEESE COMPANY

**Bega**  
SINCE 1899



GARDINER FOUNDATION