Case Study
Glanbia Ireland
Infant Formula

SUMMARY

Challenge
Improve product quality and increase yield

Solution
Inferential moisture sensor, Model Predictive Control

Results
Increased yield, rapid rate of return

BUSINESS CHALLENGE

Glanbia is one the world's leading manufacturers of dairy nutritional ingredients, employing Six Sigma methodology to help improve process efficiency.

Their site in Ireland produces a broad range of dairy products, including powders such as whey, lactose, skimmed milk and casein.

Casein powder is very granular in nature, posing a challenge for reliable in-line moisture measurement.

Without robust real-time data, process efficiency will be degraded and product giveaway increased, which will have an impact on the plant's profitability.

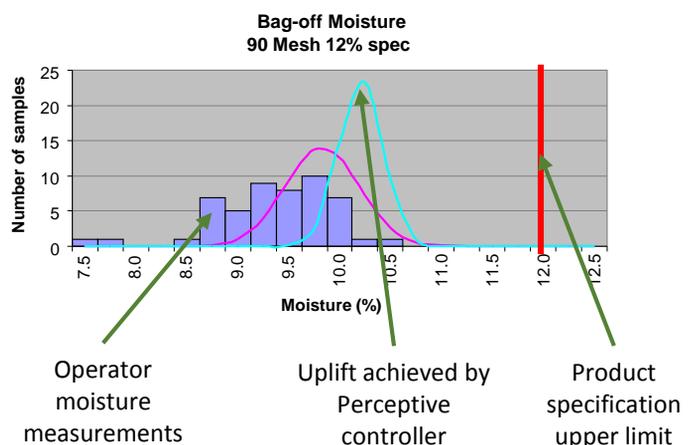## PERCEPTIVE SOLUTION – ADVANCED PROCESS CONTROL

The key operating objective in the production of Casein powder is to **maximise moisture content** while still remaining within final product specification. Operating too close to upper quality limits may result in out-of-spec end product, which would then be sold at a discount. In addition, higher moisture powder has an increased risk of causing lost production due to blockages in the dryer, cyclones or mill. Because of this, dryers are often run with a wide 'comfort' margin; final product moisture may be well below customer specification. Operation is 'safe' but more product is given away because moisture levels are low.

Perceptive Engineering constructed a robust model of dryer performance from process metrics, including raw material quality, dryer air temperatures, discreet data from laboratory analysis, dryer operating parameters. Then, we developed an inferential sensor, providing accurate, real-time estimation of casein moisture under all conditions. Using this virtual sensor as an integral part of the model predictive control system enabled the plant to maintain very tight control of product moisture.

RESULTS

The project required 12 weeks to implement. Real-time inference enabled powder moisture to be maintained closer to constraint, raising mean moisture by 0.65%. This, in turn, gave extra drying capacity which was exploited as higher throughput. Improved start-up control delivered an average of 7 hours per week of extra on-spec production.

The benefits delivered a full return on investment within 4 months of commissioning, sustained via an ongoing support programme provided by Perceptive.

Bag-off Moisture
90 Mesh 12% spec

Operator moisture measurements

Uplift achieved by Perceptive controller

Product specification upper limit

> *"Advanced control and the soft-sensor from Perceptive helped us to make great improvements to process efficiency. Exit moisture capability in the Casein dryer increased from 1.8 to above 3.5 Sigma and the Perceptive system is a key part of the control room."*
>
> **Niall Herlihy, Process Optimisation, Glanbia Ireland**

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