

Optimised tank capacity planning at world's largest chocolate factory achieves 60% cost savings

About Barry Callebaut

The Barry Callebaut Group is a world-renowned manufacturer of high-quality chocolate and cocoa products. As a global leader doing business in 138 countries, it has over 13,000 employees, 66 production facilities and 26 Chocolate Academy centres.

Its Wieze factory in Belgium is the largest chocolate factory in the world, producing around 1,000 tons of liquid chocolate per day, worth upwards of €4 million per day. It supplies many famous chocolate brands, including Mondelez, Nestlé, Hershey, Unilever and Tony's Chocolonely.

The Challenge

Barry Callebaut is currently on track with a significant digital transformation and investment programme that will modernise and streamline its international operations. Its ambitions include decarbonising its value chain to become net zero by 2050.

Operating in the food industry doesn't come without risk however, particularly

when factors outside your control occur, such as contamination or food safety incidents. In 2022 Barry Callebaut experienced a major crisis that impacted the business's volume. An outbreak of salmonella was identified from a supplier's lecithin batch. As lecithin is used in all chocolate production lines, Barry Callebaut took the precaution of shutting down its Wieze factory for

approximately 70 days, preventing the affected chocolate from entering the retail chain while a clean-up and disinfection took place.

Following the salmonella crisis, the factory at Wieze made plans to improve its quality testing processes for every single delivery from its suppliers. A commitment was made that no chocolate will be delivered to customers until all results are available and this led to an additional 24 hours of testing time.

HIGHLIGHTS

- Barry Callebaut automates the salmonella testing process, reducing the costs of test waiting times by over 60%
- valueXstream helps Barry Callebaut enhance efficiency and operational optimisation by realising a cost-effective solution for the Wieze factory's tank capacity planning.
- A dedicated planning tool enables one version of the truth, automating waiting times and tank storage capacity details so operations staff are not manually having to make decisions.



GUMPTION



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For longer transit deliveries to Poland, south of France and north Germany where delivery times average two days, test results would be ready before trucks were unloaded. But for the Group's Benelux market, which accounts for up to 70% of its liquid chocolate customers, lead times can be as short as three to four hours. Therefore, the team needed to work out the most efficient and cost-effective way of storing the chocolate while waiting for test results before delivering these orders.

In theory, the options were to either load the chocolate onto the trucks or store it in the factory's tanks. Neither option was optimal or even possible. The storage tanks at Wieze have limited capacity due

to the factory being one of the oldest in the world. In addition, Barry Callebaut is known for the variety and flexibility it offers to customers and therefore tanks are allocated according to customer's individual product specifications.

On top of this, having 60 trucks waiting in a holding bay every day while the test results were processed was a very costly option, potentially around €60,000 per day.

Sumit Gupta, Supply Chain Planning Manager, Barry Callebaut Group, explains, “We could not justify these costs with the senior leadership team. We needed to look in detail at how we could optimally solve this challenge and reduce our costs.”

The Solution

For customers with more than one day's transit time, the strategy is straightforward. The testing is carried out while the goods are in transit and by the time they arrive at the destination, the driver is alerted to the results. For customers with less transit time, the team had to figure out how and where specific chocolate orders should be stored while awaiting test results.

Sumit continues, “Due to the sheer quantity of chocolate produced each day for different customers, over 1,000 tons, it was not feasible to rely on staff to make decisions manually about where the chocolate would be stored during testing. Our aim was to optimise our tanks, which have a total capacity of 2,000 tons, and combine loads using calculations based on our data.”



Achieving agile operational optimisation with minimal investment

Barry Callebaut turned to Gumption's supply chain architects, valueXstream, to help it apply innovative thinking to operational optimisation. More agile than a traditional large consultancy firm, valueXstream moved quickly to translate Barry Callebaut's challenges into a cost-effective planning solution to manage tank capacity.

Using the data provided by the Wieze team, it designed a blueprint for the production lines that worked according to the best cost-optimal solution for holding chocolate in the tanks and/or trucks while testing takes place. Waiting costs would not be eliminated but, by combining partial shipments while optimising tank capacity, costs could be kept to a minimum. For example, if you combine loads with the same recipe in one truck, you free up trucks for other loads.

valueXstream developed a planning process and created a planning tool. The tool precisely tells the user where the liquid chocolate should be stored during testing, and when it can be released for delivery. It provides staff at the Wieze factory one version of the truth, so they know exactly when to keep goods in the storage tanks and when to load onto the trucks.

Operations staff no longer have to make decisions based on their best knowledge. Instead, they simply follow process using the planning tool, devised from data the schedulers and transfer planners have inputted. This not only dramatically reduces human error but also enables updates such as cancellations or delays to be instantly updated on the system.

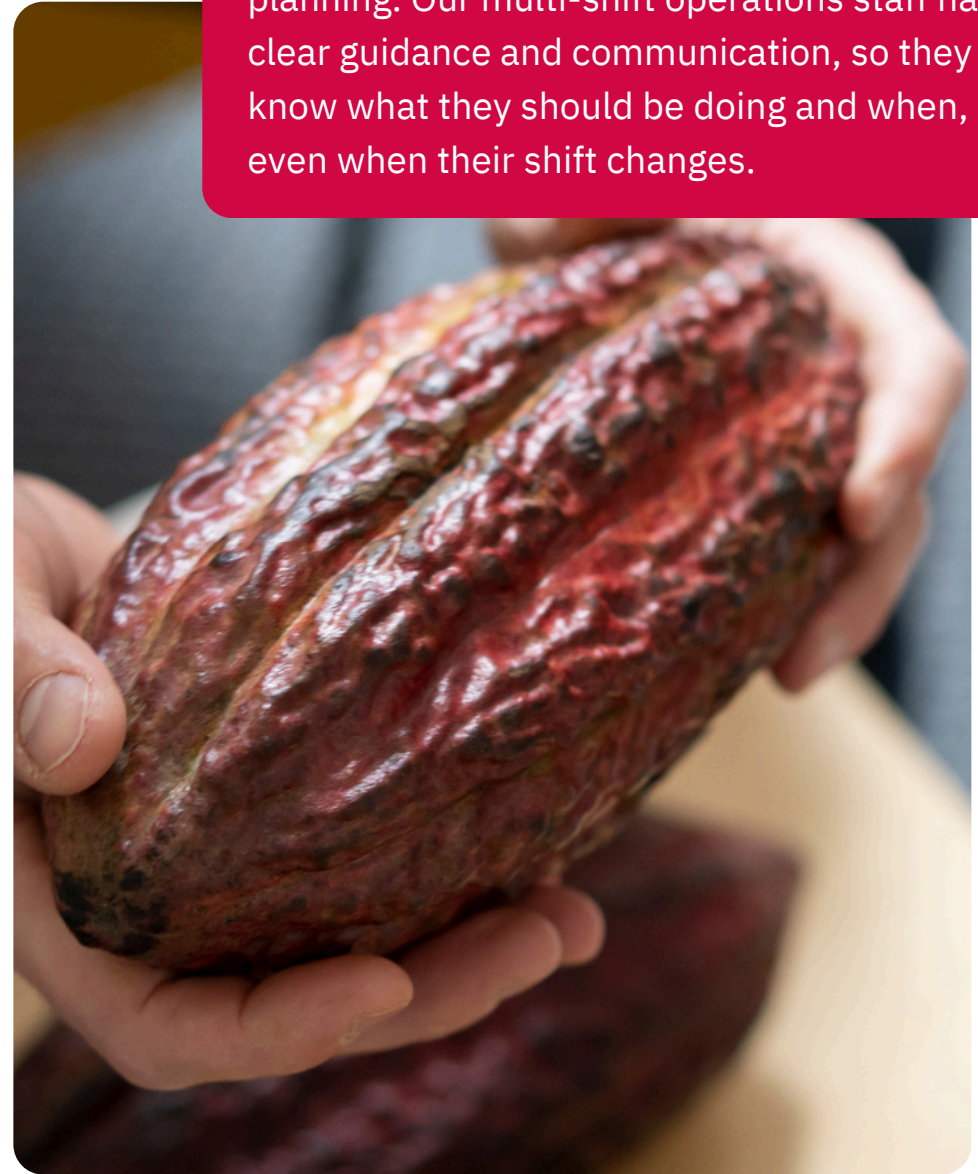
Sumit says, "Any changes at the customer end are updated, so operators are working off the latest information. This makes the tool reliable and trustworthy, and is also very easy to use."

In a very agile deployment, valueXstream solved a pressing challenge around how to optimise and execute the waiting times process and delivered the planning optimisation tool in under three months.

"We now have full oversight of our tank capacity planning. Our multi-shift operations staff have clear guidance and communication, so they know what they should be doing and when, even when their shift changes. As a result, we have reduced our costs by over 60%," highlights Sumit.



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Partnering with valueXstream, part of the Gumption Group

"Working with valueXstream has been a great experience. They're reliable and transparent, and I really appreciate the open and honest discussions I've been able to have with them. The planning expert assigned to us from valueXstream was intelligent, collaborative and brought valuable new ideas to the table. It's been a two-way partnership and their level of flexibility and understanding has made it a perfect working relationship."

Sumit Gupta, Supply Chain Planning Manager, Barry Callebaut Group.



Benefits

Optimised tank capacity planning

The optimisation planning tool provides one version of the truth for the factory's tank capacity planning, delivering clear guidance to its multi-shift operations staff for when to keep goods in the storage tanks and when to load onto the trucks.

Aligned factory processes with business goals

The Wieze factory has aligned its chocolate waiting times with suitable storage capacity management, meeting its business goal of overcoming a pressing operational challenge.

Achieved cost efficiencies

Barry Callebaut has reduced costs of waiting times by over 60% by automating and optimising the salmonella testing process. The process also ensures the factory can continue to apply the just-in-time system for raw materials' delivery, ensuring cost efficiency.

Reduces human error

The planning tool automates waiting times and tank storage capacity details so operations staff are not manually having to make decisions. This saves time and money, avoiding any need to close production lines because of overcapacity or due to mistakes.