

## Industry Solution Sheet: Agribusiness

### Challenges and Capabilities

The world's oldest industry, agriculture, is currently undergoing a profound transformation, changing the way that agribusiness enterprises do business.

These companies (which are engaged in the farming, production, processing, and distribution of agricultural goods) have made great strides in terms of efficiency and output, **with total factor productivity increasing by an average annual growth rate of around 2.2% over the past 50 years and global food supply tripling over that same time period (far outpacing world population growth, which doubled)\***.

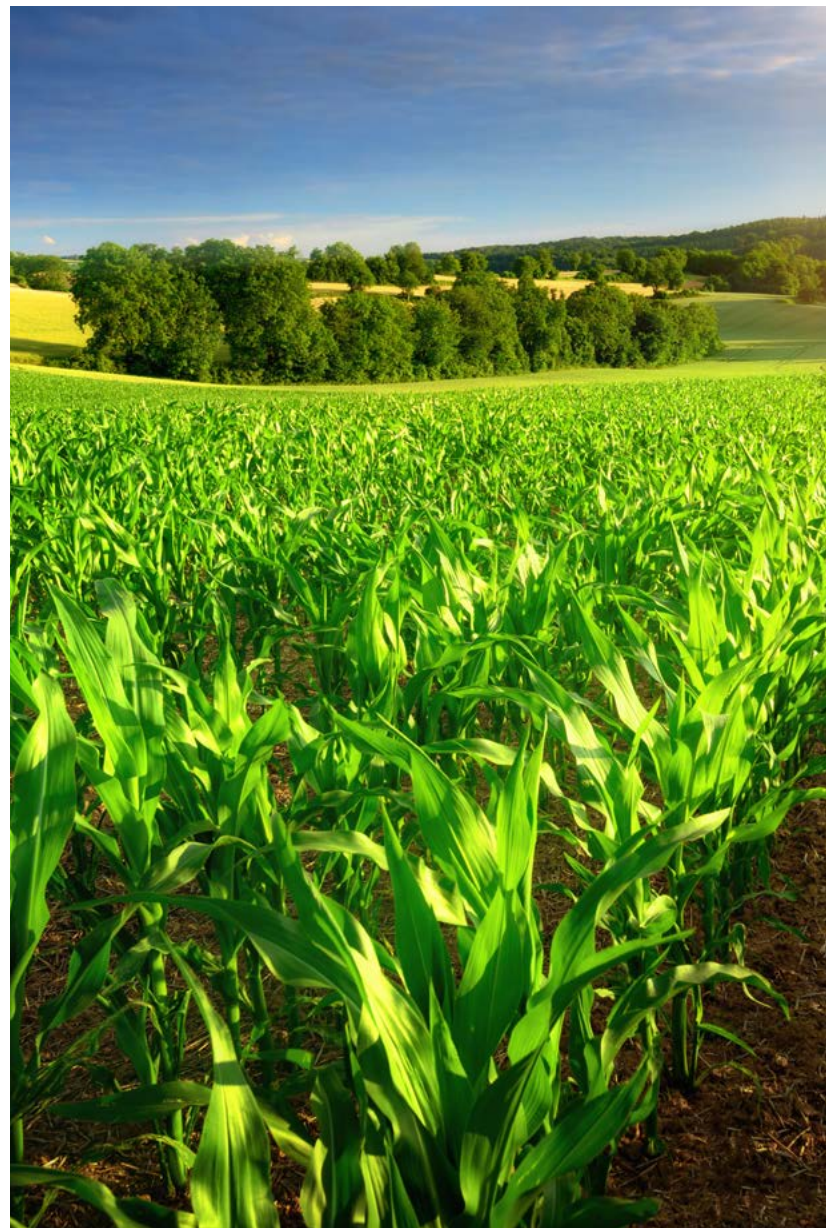
But the question that is top of mind today for many agribusiness industry executives is: **Where will the next productivity gains come from?**

To answer this question, leading agribusiness enterprises are looking to advanced analytics technologies.

Indeed, the introduction of sophisticated, data-driven advanced analytics tools and new agritech, IoT, and drone technologies in the 21st century has ushered in an industry-wide revolution, and agribusiness players across the business spectrum (from crop producers to breeding companies to food processing companies to agrichemical, biofuel, seed, and animal feed manufacturers) are constantly discovering new opportunities to:

- Break down silos across their operational networks and drive **greater integration, alignment, automation, and optimization** across their value chains.
- **Boost the efficiency** of their farming, disassembly, blending, transport, and other processes – so that they can make the best use of their raw materials (plants and animals) and resources (such as workers, equipment, fields, and processing facilities).
- Improve their end-to-end planning and decision making in order **meet demand in the most profitable and sustainable manner** possible.

\* "Productivity Growth in Global Agriculture Shifting to Developing Countries" by Keith Fuglie and Sun Ling Wang, published in *Choices: The magazine of food, farm, and resource issues*.





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One key technology that is helping to fuel this revolution is mathematical optimization – a powerful prescriptive analytics software tool that enables agribusiness players to make optimal, data-driven plans and decisions and move products from farm to factory to market to table in the most operationally- and cost-efficient way.

Indeed, with mathematical optimization, agribusiness companies can make the best possible decisions – while taking into account forecasted and real-time market demand, weather patterns, price fluctuations and exchange rates, and other factors – in wide range of strategic, tactical, and operational areas including:

- **Portfolio:** Which products to produce and when to produce them?
- **Production:** How to schedule, manage, and utilize critical resources and run farming, breeding, and production operations?
- **Raw Materials:** How to process (disassemble, assemble, blend, and package) raw materials to transform them into products?

- **Workforce:** How to create rosters and schedules for workers?
- **Logistics:** How to transport products across the entire supply chain network?
- **Inventory:** Which products to keep in which locations at specific times?

Leading agribusiness enterprises utilize mathematical optimization – in a wide variety of off-the-shelf and custom-built applications – to cultivate, facilitate, and automate optimal, integrated planning and decision making and realize tremendous business benefits including superior on-time, in-full (OTIF) delivery performance and service levels, better utilization of resources and raw materials, reduced operating costs and excess inventory, and greater revenue growth and profitability.





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### Optimizing Operations Across The End-to-End Agribusiness Value Chain

With mathematical optimization, agribusiness companies can foster greater alignment, agility, efficiency, and profitability across their end-to-end operations.



Supply Chain Network Design



Demand Forecasting and Planning

Utilizing mathematical optimization techniques like constrained forecasting in combination with machine learning to improve forecast accuracy.



Product Portfolio Optimization

Selecting the best mix of products to satisfy market demand and increase profit.



Supply Planning

Optimally matching supply with forecasted demand to maximize profit margins and customer satisfaction.



Farming, Breeding, Collection, and Production Operations

Optimizing the utilization of critical resources (including workforce and machines) in order to boost efficiency and output and minimize costs.



Inventory Management

Optimizing inventory levels (storing the right amount and type of goods in the right locations at the right times) in order to reduce holding costs while maximizing service levels.



Transport and Distribution



Retail





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### Business Benefits

By leveraging mathematical optimization, agribusiness enterprises can unlock the value of their data by using it to optimize their end-to-end planning, decision making, and operations and achieve numerous key business outcomes including:

- Minimizing operating, labor, inventory, and other costs.
- Increasing resource utilization and efficiency.
- Optimally matching supply and demand.
- Foster enhanced supply chain integration, visibility, and agility.
- Improving utilization of raw materials.
- Ensuring compliance with environmental regulations and alignment with sustainability initiatives.
- Boosting service levels, OTIF delivery performance, and customer satisfaction.
- Driving improved bottom-line results and revenue growth.

**ALLIANCE**  
FARMERS' PRODUCE

### Case Study: At A Glance

**Company Name:** Alliance Group

### Company Description

One of the largest lamb and mutton producers in the world, exporting to 65 countries and representing over 15% of the world's cross-border mutton trade.

### Solution

A cloud-based mathematical optimization application – built by Biarri and powered by the Gurobi Optimizer – that enables Alliance to automatically generate optimal sales and production plans and make the best possible decisions to manage its sales and production operations.

### Results

- **Increased revenue** by determining the optimal product mix to satisfy customer demand.
- **Reduced operating costs** and improved efficiency.
- **Greater supply chain visibility** and control across sales and production operations.

Read the full case study [here](#).

