

# Veggie Burger Production

**PROJECT:** Coordination and Integration of Production Processes  
**CLIENT:** Confidential Food Manufacturer  
**LOCATION:** Ohio  
**SERVICES:** Feasibility Study; Preliminary and Final Engineering;  
Project Management

***Meatless burgers have grown in popularity. What used to take several separate machines and processes has been integrated in one process with PLCs, remote I/O and HMI software.***



A new production line was installed for one of the largest U.S. producers of meat alternative food products, to meet growing demand for meatless burgers.

Many challenges exist in installing and efficiently running a new production line. These include achieving run to run repeatability for various product recipes, archiving process data for quality assurance (QA) requirements, tracking production, and operator training. The most important challenge, however, is integrating various machines into a single coordinated production line.

The new line consists of process machines purchased from various domestic and international suppliers, along with interconnecting conveyors. Each machine possesses its own OEM control system, resulting in a variety of PLCs and proprietary controllers that must be programmed to work in unison. The Client turned to River, to design a control system that would tie these machines together, providing a line that runs automatically in a synchronized fashion.

River used an Allen-Bradley PLC 5/30 as a supervisory controller, coordinating actions of individual machine controllers. Variable-frequency drives on remote I/O were used for conveyors between the machines to coordinate line speeds.

Working with each OEM, machine controller to PLC communication was established through AB's Remote I/O, DH+ or hardwired interfaces. A Xycom Industrial PC running Wonderware InTouch software serves as the HMI and data collection terminal. Data from the HMI is written to production and quality databases over an Ethernet connection using ODBC and SQL calls. Explicit, step by step sequences written into PLC and HMI programs take the operator through each stage of production, providing on-screen instructions for each task.

With all equipment in the line running automatically, production rates now run between 300-400 patties/minute, a significant improvement from the 160 patties/minute of the original lines. Collection of QA and production data can now be paperless, with values being logged directly to the database.

Managers have direct and immediate access to QA and production data as soon as they are logged. Users can quickly identify abnormal yields and take action to minimize underweight products. Central monitoring and alarm reporting on the OEM machines, via the supervisory PLC and HMI, results in increased uptime. The explicit on-screen instructions reduce training time and allow for faster start-ups and product changeovers. In the end, the Client produces patties at more than double the original rate, given the same number of operators. The success of this control approach was so complete that it was used again for another production line.



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