No. 1 in a Series of Whitepapers on the Topic of Business Performance Improvement in the Food and Beverage Industry by USC Consulting Group

Optimizing the Supply Chain

How the poultry industry can profit from technology

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"In today's environment, no processor can avoid improving operations, reducing costs, or driving revenues by optimizing their meat blocks."

- Jeffrey Copple, USCCG, Operations Manager

In a low margin industry such as poultry, it is critical to control costs while building market share. The overwhelming challenge for poultry producers in getting their costs down is the sheer size of their supply chain, which extends from breeder farms, hatcheries, and grow-out houses to conversion and further processing facilities that process over 300,000 chickens (or 20,000 turkeys) a day. In today's environment, no processor can avoid improving operations, reducing costs, or driving revenues by optimizing their meat blocks.

Processing line

At the facility level, the tools for balancing available meat block components against the mix dictated by customer require-

all. As a result, a facility can be either "long" or "short" on critical components. In addition, daily decisions to buy, sell, or freeze breast meat can have significant cost and margin implications.

Add to meat block issues other such factors as multiple bird types and sizes, seasonality, and hundreds of UPCs within a facility and it is clear how very complex it can be to manage and control the entire supply chain. The pressure is enormous on planners, schedulers, and production supervisors to manipulate information and materials, both raw and in process, to keep lines running efficiently and the customer happy.

One Company's Innovative Response

One large poultry company recognized this escalating pressure and the need to better manage their supply chain and control costs more effectively. Dissatisfied with the solutions available in the marketplace, and acknowledging the necessity for more robust methodologies, this company turned to USC Consulting Group (USCCG) to develop an automated business solution designed specifically for the poultry industry.

There had been a long-standing need for a product that would address the entire process, a product that could balance the many variables associated with the supply, demand, and component mix of live operations through the conversion process facility's operations. Many companies had no methodology by which to collect information in one place, analyze it, organize it, and use it to facilitate timely, fact-based decision-making across their supply chains.

Common Industry Issues

There are a number of prevalent issues in the poultry industry today.

- **Meat Block Planning**: Inadequate meat block planning tools fail to depict a bird's required and net component pounds-available to satisfy demand. This has led to planners making unnecessary and costly meat substitutions and improper product freeze decisions. The result is greatly reduced profit margins, meat block flexibility, and market value of product on hand.

- **Actionable Information**: Inaccurate market, industry, and company information can make buy and sell decisions on eggs, chicks, and birds educated guesses, at best.

- **Flock Genealogy**: Tracing flocks back through a live operation's supply chain is often a challenging, if not impossible, exercise.

- **Inadequate Systems**: With nonexistent and disparate systems, determining the effects of various market scenarios on hatchery and grow-out capacity is difficult and time prohibitive.

- **Lack of Integration**: Limited system links between planning and scheduling functions back through live operations -- including hatchery set schedules, breeder flocks, and grow-out farms -- encumber the planning process.

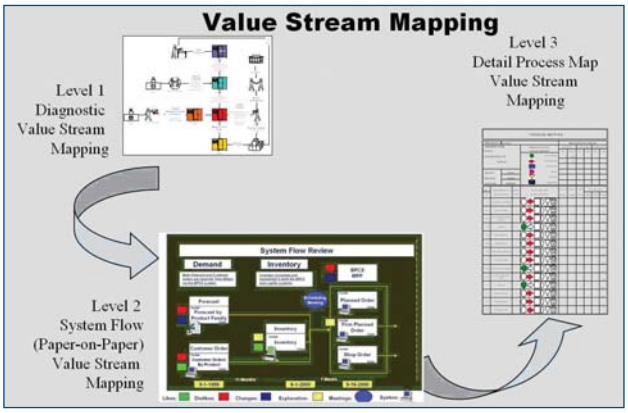
- **Poor Information Flow**: This means planning results can be untimely and out of sync, leaving operations to work without information or, worse, with faulty information on available and anticipated supply throughout the supply chain.

- **Business Knowledge**: Optimization of the available meat block and its potential revenues are limited when all or some of the systems and functions are not effectively integrated.

Tray pack operation

The Approach

The approach used to develop the automated business solution centered on the supply chain and how to optimize all facets of it that were within control. This approach, utilizing USCCG's Supply Chain Analysis Model, started with a thorough analysis of the planning, sourcing, grow-out, processing, delivery, and service aspects of the business.



USCCG value stream mapping diagram

These analyses lead to a more in-depth diagnostic project phase, which included level one and level two value stream mapping. This process made it clear that live flock management (including breeder, hatchery, and grow-out operations), meat block planning, schedule optimization, order management, shop floor control, and yield management were all critical and needed to be better managed.

The Solution

Various components of USCCG's portfolio of technology options and alliances were integrated with existing systems to provide a solution that was seamless and flexible, and that, when implemented, would work hand-in-hand as a single solution.

This implementation included: Live Production Planning (LPP), Capacity Resource Planning (CRP), Advanced Planning and Scheduling (APS), Time-Phased Scheduling (TPS), and Process Analysis and Management Reporting (PAMR). All these provided an integrated solution through the internal supply chain: strategic planning -- right sourcing -- optimized scheduling -- controlled execution -- operational reporting -- product run analysis -- manageable inventories -- efficient delivery -- and superior customer service.

When implemented in conjunction with a USCCG consulting engagement, the tools described in this paper will typically drive numerous and significant improvements.

Typical Range of Improvements

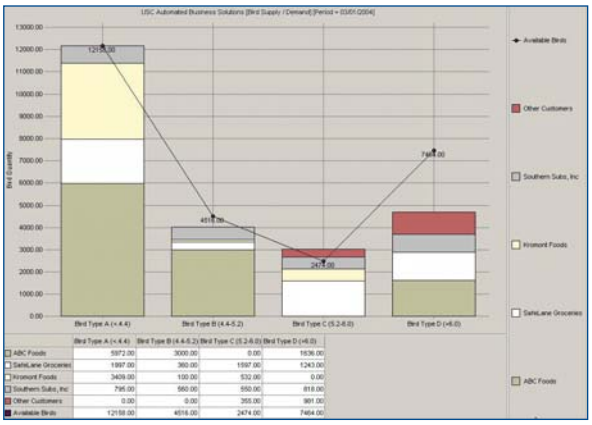
Live Operations	Reduced Chick Cost (Cents)	.5 - 1
	Feed Conversion (Point Reduction)	2 - 6
First Processing	Labor Cost Per Head Reduction	10 - 25 %
	Yield Increase (Percentage Points)	.5 - 2
Second Processing	Labor Cost Per Pound Reduction	15 - 30 %
	Yield Increase (Percentage Points)	1 - 4
Further Processing	Labor Cost Per Pound Reduction	20 - 40 %
	Yield Increase (Percentage Points)	2 - 5

Tools Within the Solution

Capacity Resource Planning

The CRP component was configured specifically for the poultry industry because facility-level resource planning (acquisition and disposition of assets), skilled labor planning (hiring and training), and meat planning (hatchery and grower contracts) are a central part of the strategic planning process.

Across the internal supply chain, the CRP tool provides a realistic view of available versus required resources and materials (meat block) at the item and product family levels. One of the outputs of the CRP process is the Enterprise Supply and Demand Analysis, which provides visibility to birds required by weight category and processing facility.



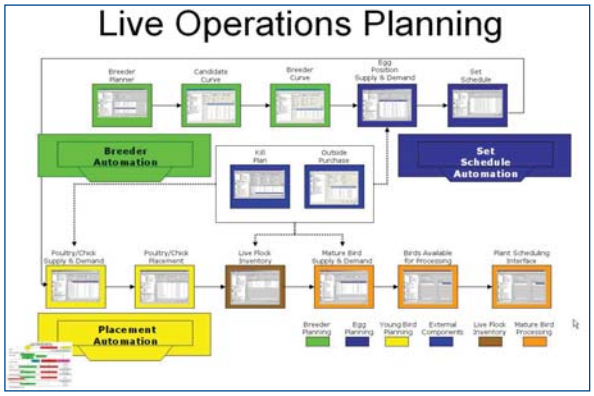
Interactive supply-and-demand analyses provide the ability to see the impact of decisions flow through the entire process.

Live Production Planning

The LPP component helps poultry producers balance demand from and between live operations and processing facilities. It is a planning and scheduling tool that provides such information as projected birds-available-for-processing and supply-and-demand analyses (also known as position reports) for eggs, chicks, and mature birds.

The supply chain contains critical control points, which are evident when you consider that the business is dependent on knowing how it is positioned to respond to demand all the way back to the hatchery, through grow-out and processing operations. To help manage these critical control points, a set of supply-and-demand analyses has been provided. These interactive analyses show both excesses and shortfalls on the projected raw material and meat block planning horizon. This allows the planner to see the impact of decisions through the entire operation.

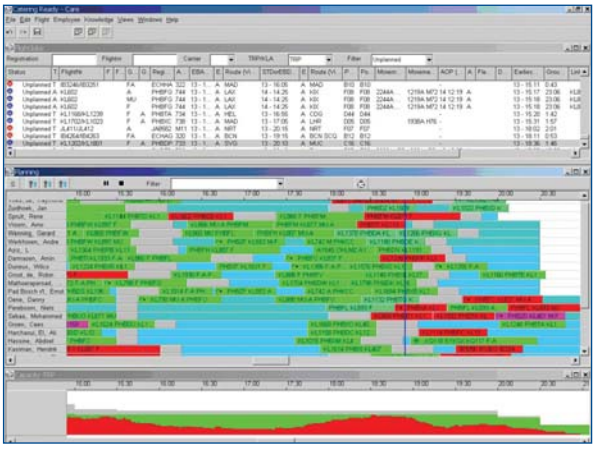
Management is then able to see, quickly and easily, the impact that a specific decision may have on any part or several parts of the supply chain.



Live operations system component flow

Advanced Planning and Scheduling

An Advanced Planning and Scheduling solution was employed because of its proven ability to provide supply chain optimization. APS optimizes the supply chain by solving such complex scheduling puzzles as those associated with optimizing meat block usage while balancing a flexible labor force, uneven resource capacities, and shelf-life-sensitive product movement.



Advanced Planning and Scheduling

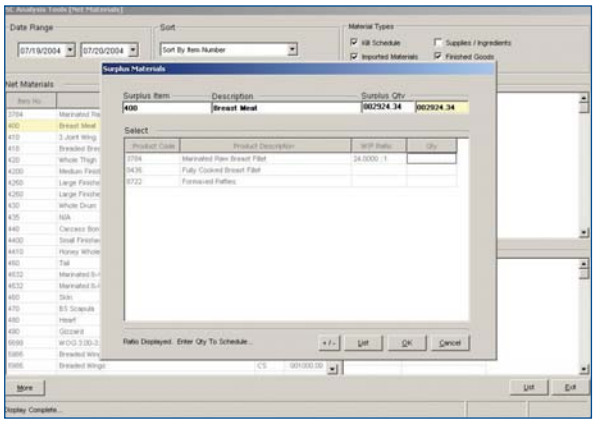
The APS application accepts planning data from the CRP and LPP components, along with customer demand data from the Order Management System. It is able to resolve conflicts and optimize the flow of meat through the conversion and further processing operations by planning all critical business processes simultaneously, a very complex a task!

The output is a time-phased, sequenced, and optimized plan ready for execution. The TPS component works with APS to provide the shop floor with execution schedules and reports.

Time-Phased Scheduling

The associated Time-Phased Scheduling tool provides the ability to execute the optimized schedule. This includes being able to manage meat block and material surpluses and shortages by component, based on the optimized schedule received from the APS application.

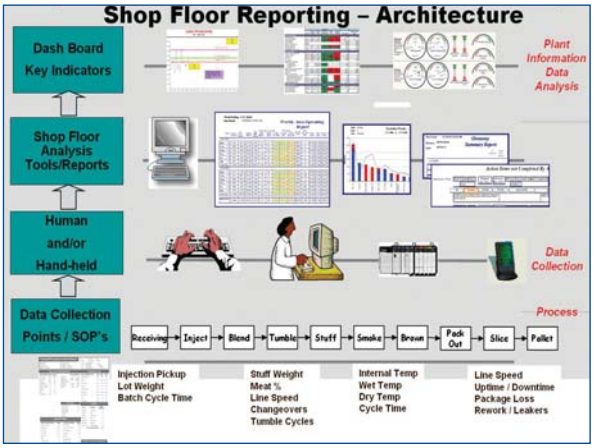
To help manage shop floor activities, resource schedules are created as part of the shop floor execution functionality in TPS. Resource schedules coordinate material movement, project support resources requirements, plan equipment runs, predict resource utilization, and schedule labor requirements by skill code.



Meat block planning excess material screen

Process Analysis and Management Reporting

The Process Analysis and Management Reporting module was implemented to capture critical information from the shop floor, present key metrics to all levels (online reviews and hard copy reports), and provide a means for analyzing product run results.



Process Analysis and Management Reporting architecture

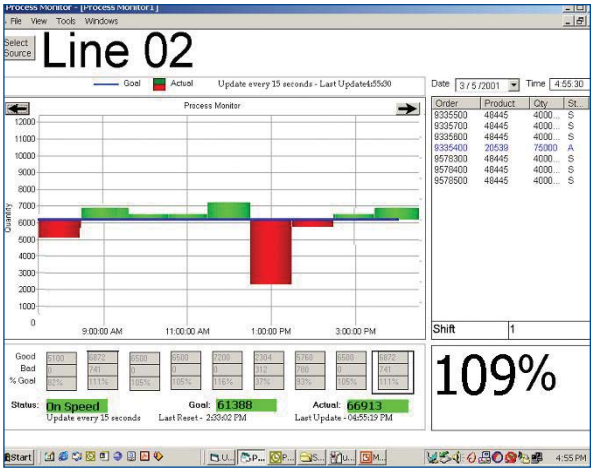
The Process Analysis component collects and displays production information via online reports and work center Process Monitors, which display actual production as it becomes available.

The Management Reporting component summarizes and presents data at various levels of detail for management review and/or supervisory use.

Some of the features that make up the PAMR tool include:

- the Process Monitor, which presents production results compared against targets and goals as the results are available;

- the Data Analysis tool that turns data into information by summarizing and presenting the data you want in the format you prefer;



Production Process Monitor

- the Opportunity Manager, which provides a means for employees to raise and resolve production issues; and

- the Report Manager that includes a set of operational reports and graphics that assist both management and operations at the appropriate level and time.

Benefits of the Integrated Solution

After implementing the Live Production Planner, one client recognized that field supervisors and department accountants could enter information directly, reducing the time required for weekly inventory maintenance from 40 hours to 5, an 88% improvement.

Supply-and-demand screens for eggs, chicks, and mature birds provide quick inventory snapshots, a functionality not previously available, for better-informed decision-making. It is now possible to model future inventories and requirements to satisfy a variety of sales projections. Planning for farm capacity requirements, by season, is also significantly easier.

Net requirement screens highlight shortages to allow planners to make accurate, cost-effective material substitutions, and show excess materials that could be used to satisfy future demand without freezing product.

Product flow and order velocity is increased by reducing the time product spends as work-in-process, while product previously lost to shelf life depletion is reduced by scheduling and making only what is required when it is required.

The majority of a planner's time is now spent analyzing information to make good decisions, versus making hasty decisions based on labor- and time-intensive number crunching.

The decision-making process in the turkey and chicken industries runs 18 to 24 months. What the integrated solution sets out to do, with algorithms, an optimization engine, and industry standards data, is plan and synchronize all the activities required to support a company's ability to meet demand and optimize efficiency – thus saving money at every stage of the supply chain.

The Bottom Line

Dovetailing all the system pieces and integrating them with existing ERP and Order Management systems has brought a one-solution approach to the entire supply chain!

Now there is complete integration from beginning to end. All of the different data information points are connected, which improves decision accuracy, reduces cycle and administrative times, and decreases conversion cost, all of which equates to a more effective supply chain and improved profit margins.

USC Consulting Group (USCCG) is an independent management consulting firm with nearly 40 years' experience in the area of business performance improvement. The firm excels at operations management and offers an array of services that includes Six Sigma, Lean transformation, supply chain optimization, process optimization, project management, value stream mapping, patient flow management, training and facilitation, blended learning solutions, and modeling and simulation. USCCG is a Microsoft Managed Partner headquartered in Tampa, FL, with offices in Chicago, Montreal, and Toronto.

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Jim Sorbello is USCCG's Poultry Industry practice leader. In his role as operations manager, Mr. Sorbello has led numerous successful business performance improvement initiatives for major companies in such industries as food and fresh meat processing, Tier 2 automotive, hardware, and heavy industry, as well as in program and project management. In these engagements, his operations team has been responsible for improving a number of different business aspects, including throughput, process control, quality, maintenance, warehousing and distribution, SG & A, engineering/product development, scheduling, and vendor and SKU rationalization. His recent clients have included Tyson Foods, Keystone, ConAgra, Heinz, Wescast Industries, United Fixtures, Masco, Lexington, Kraft, and Willowbrook Foods.

Mr. Sorbello joined USC Consulting Group in 1997. During his tenure, he has demonstrated expertise in both traditional and emerging tools and methodologies, and quality improvement/Six Sigma implementations. In addition, he has been a solid contributor to the firm's internal training and development programs.

Prior to joining USCCG, Mr. Sorbello held a variety of management positions in the healthcare industry and was an adjunct faculty member for a university in Atlanta. He earned his Bachelor of Arts and Master of Arts degrees in English and Literature from San Diego State University.

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