

FOOD PROCESSING

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Applying lean to sanitation

A recent FSIS notice allows for extended time between cleanups; lean sanitation can get you there and safely save you 33 percent in costs.

By Harold Tessman

Sanitation is a paradox in food processing. Food safety cannot be assured without robust cleaning practices, but sanitation itself adds no value to the product. Dealing with these potentially conflicting objectives is a paramount responsibility for management.

Recognizing there is no “one size fits all” approach to product safety, the USDA commented earlier this year on the opportunities for establishments to revise cleaning practices and extend periods between cleanups.

This clarification on the required frequency of cleanup provides food processors with a sizable opportunity to increase capacity utilization by developing alternate sanitation programs and decreasing non-operating hours. The upside is potentially huge — up to a 33 percent gain in capacity and associated reductions in costs, working capital and long-term assets.

FSIS Notice 27-06, issued April 16, summarizes the USDA’s position on extending processing activities and increasing the interval between full cleanups. It states:

To decrease downtime, increase production efficiency and

minimize expense, establishments can extend the period between cleanups. However, establishments must ... develop, implement and maintain written standard operating procedures for sanitation, and ... those sanitation SOPs [must] be effective in preventing direct contamination or adulteration of product.

Notice 27-06 continues by providing further details and basic direction for developing and implementing “alternative cleaning procedures and frequencies.”

Introducing lean sanitation

Some processors have extended run times by conditioning the environment to inhibit bacteria growth and/or producing an item for multiple shifts before conducting sanitation during a changeover. This approach may achieve higher efficiency, but gains are offset by increased inventories, lower flexibility and higher overheads. Employee morale, safety and health also may be negatively affected, leading to increased turnover, absenteeism and occupational injuries.

Applying the tools of lean manufacturing to reduce the complexity and time to complete cleanup is a better approach.

FIGURE A: LEAN SANITATION ROADMAP

Pre-Launch	Senior Management Buy-In	Project Charter	Announcement	Standardization	Rapid Improvement Events
Phase I	Process Flow Diagram	Value Stream Map	Project Plan		
Phase II	Five S's	Point-of-Use Storage & COP	Self-Inspection		
Phase III	Rapid Changeovers	Error-Proofing	Total Productive Maintenance		
Phase IV	Cross-Training	Work Cells	Visual Control		

LEAN SANITATION

We call this Lean Sanitation.

Let's take a typical processing operation running two shifts five days per week. Utilization of true capacity, defined as 24/7, is less than 45 percent. The key premise of lean is that 80-90 percent of activity is waste. Sanitation is no exception. In our example, value-added sanitation accounts for less than 90 minutes each day.

Now introduce Lean Sanitation to replace dedicated shifts and crews for sanitation, with work cells performing intensive operational sanitation and rapid cleanups as required. Production lot sizes are reduced lowering inventory and increasing responsiveness. Utilization of 24/7 capacity almost doubles to 80 percent.

Four steps of implementation

Figure A shows the roadmap for implementing Lean Sanitation. In pre-launch, you need to build consensus and buy-in for the initiative by outlining measurable short-term goals and securing sponsorship from senior management. Approach key members of the organization to discuss the proposal.

Lean is multi-functional and requires extensive cooperation and communication among all departments and levels of the

organization. Building involvement early in the process will make later stages of the transition easier.

Once the project basics are completed, senior management should announce the initiative through a series of meetings and written notices. Senior management's visibility throughout the process will reinforce the importance, priority and long-term commitment to the changes.

Assembling the steering team will require some finesse to balance quantity versus quality. On one hand, there is the tendency to include every department and draft the most enthusiastic supporters for the project. On the other hand, too large a group will slow down the process. It is better to limit the players and pull others in for specific assignments as needed. Adding naysayers to the team will maintain a balanced perspective. The bonus is that as pessimists buy into the program, they become some of its leading proponents.

A lean transformation is a continuous cycle of innovation and standardization. From kick-off and thereafter, the organization will constantly alternate between kaizen improvement events and stabilizing and sustaining activities.

FIGURE B: PROCESS FLOW CHART (SPAGHETTI DIAGRAM)

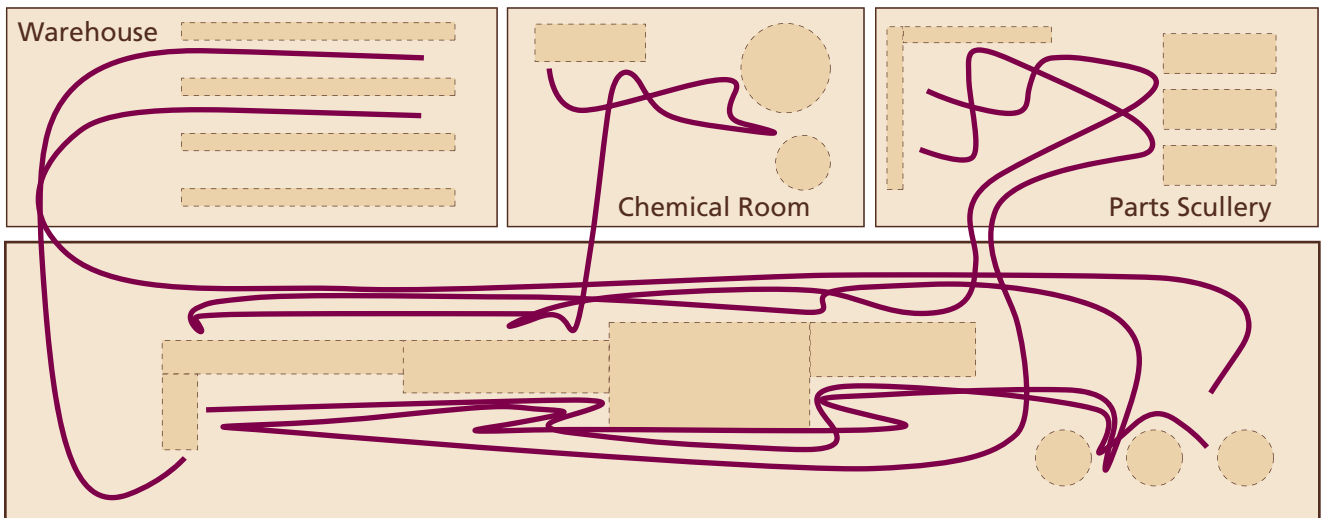
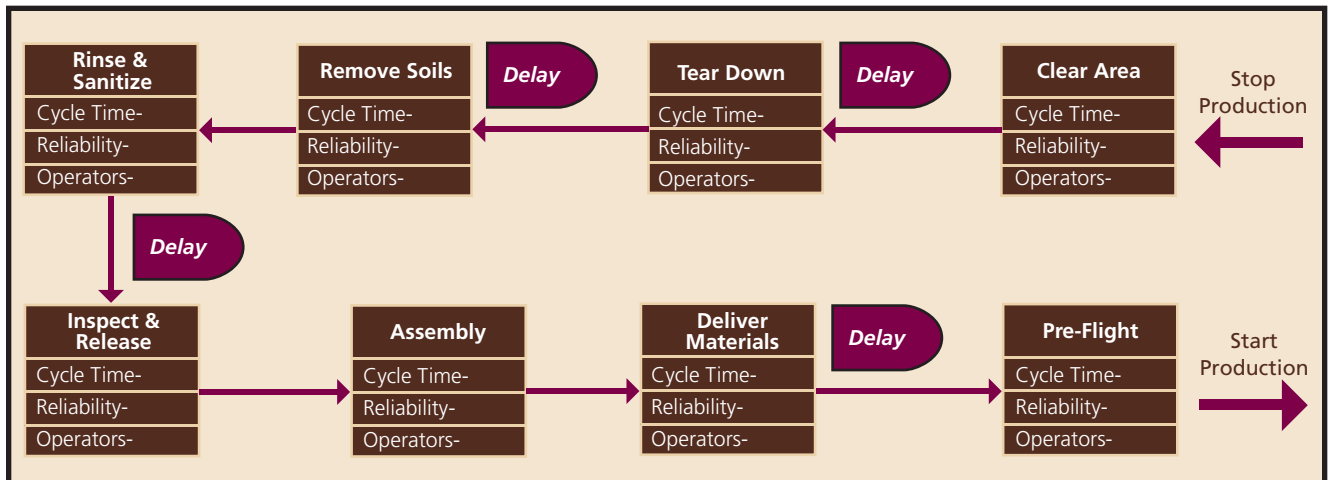


FIGURE C: SIMPLIFIED SANITATION VALUE STREAM MAP



Kaizen, a Japanese word meaning “to make better,” is the innovative component of lean. Kaizen events are organized projects focused on a specific opportunity and lasting no more than a few days. By keeping the scope of the project small and engaging both the people performing the work and management in kaizen events, breakthrough improvements are routinely achieved.

Work standards are lean’s stabilizing and sustaining element. The principles of work standards in lean differ substantially from the outdated concept of engineered work. In applying standards, we distinguish between controlling and managing. Controlling implies inflexibility, insensitivity and disrespect for others’ knowledge. Managing is a framework for conducting activities while enabling individuals to use their experience and creativity to suggest improvements.

Phase I: Assessing current conditions

The first steps are to develop a detailed understanding of sanitation practices as they really exist, to select specific opportunities for improvement and to identify who in the organization needs to be included at each step. Throughout this phase, developing consensus and buy-in are crucial.

Refer to the examples of a flow diagram and a value stream map (VSM) in figures B and C. To develop this documentation, assign members of the team to trace the movement, tasks performed and time to complete each task using 11x17-in. schematics of the area and equipment. Two or three reviews of the entire cycle should be sufficient to collect the necessary information.

In a large room with plenty of wall space, redraw the flow using easel pads or Post-It notes. Invite several people to review the process and ensure all the key activities are represented.

Preparing the flow diagrams and value stream maps will be an eye-opener and readily will point to the magnitude of waste in the process. Using the information in the diagram and VSM, complete the major elements of the project plan, assign task leaders and schedule completion dates for each step. Regular reviews with senior management and the entire organization should be included in the plan.

Phase II: Eliminate wasted movement, waiting and rework

Phase II applies three core lean tools to eliminate time wasted getting organized, delays incurred between procedures and rework due to inspection failures. The results will be positive and immediate. Beginning with the low-hanging fruit, the program seeks to attract followers and develop enthusiasm for the initiative.

There are five S’s to remember: sort, store, scrub, standardize and sustain. The focus of 5S is on organization and house-keeping, not equipment sanitation. Every department and shift should participate in the 5S event.

Evaluate tools and materials to determine what, when, where and how frequently each is used. Discard obsolete items, and organize the remaining items for efficient retrieval and put-away. Heavy emphasis should be placed on improving operational sanitation practices, which will control microbial activity and reduce time wasted preparing the area at cleanup.

Point-of-use storage should be introduced at this stage to eliminate time wasted retrieving tools and supplies. Cabinets fabricated of suitable materials can be stocked with materials

where these items are regularly used.

Installing clean-out-of-place (COP) tanks will eliminate wasted time moving equipment between the processing areas and the scullery. COP also positively impacts productivity by enabling cleaning personnel to perform parallel tasks while parts are being cleaned. Using baskets for smaller parts improves retrieval and reassembly.

As the implementation progresses, redeploy a portion of the productivity gains to a rigorous self-inspection program. Develop standard inspection procedures and provide cleaning personnel with the proper training and tools to perform inspections.

If a separate pre-op is conducted by Quality Assurance, it should be discontinued. Invest the resources to educate the workforce and instill discipline, conscientiousness and integrity to thoroughly review and correct deficiencies prior to final pre-op. You may consider using incentives to help with the transition of these responsibilities.

Phase III: Decrease cycle time and improve reliability

At this stage of the transformation, the focus shifts to improving cleaning procedures and equipment design for sanitation and maintainability. Whereas Phase II concentrated on “quick hits,” you should expect procedures and equipment modifications to go through several weeks, even months, of review and improvement.

As their names imply, the objective of rapid changeovers (RCO) and error-proofing are to substantially shorten the cycle time for cleanup and to institute practices that ensure the work is performed correctly. Sanitation is essentially a changeover during which a deep cleaning is conducted to remove microbial contamination.

The sanitation cycle can be broken down into five separate steps: preparation, tear-down, cleaning, set-up, and trials and adjustments. RCO distinguishes between external procedures (those which can be conducted while equipment is operating), internal procedures (those that require equipment to be shut down) and unnecessary procedures.

Unfortunately, there are no boilerplate solutions for RCO and error-proofing. Each step in the process must go through one or more kaizens to eliminate work, minimize internal procedures and error-proof the entire process.

Envision a NASCAR pit crew. Precise coordination and efficacious design of equipment and tools enable the pit crew to accomplish tasks in a fraction of the time it would take you or me.

A few examples of RCO and error-proofing methods:

- Develop checklists and graphics of assemblies
- Install cams or single-turn fasteners for rapid loosening or tensioning
- Replace bolts with three-point pins or clips
- Design jigs and special tools for disassembly, cleaning and reassembly
- Modify equipment to improve access for cleaning or seal off area from soils
- Design exchangeable inserts versus dedicated parts
- Eliminate adjustments and/or implement centerlining
- Pre-flight with off-line trials and adjustments

Total productive maintenance (TPM) is integral to achieving rapid changeovers and error-proofing cleaning and assembly.

TPM is a cross-functional approach to improving overall equipment effectiveness, defined as uptime, performance and quality.

TPM creates joint ownership for maintaining and operating equipment. Operators and sanitation assume some responsibility for equipment care while craft personnel have extended responsibility for simplifying operating procedures and design for cleaning.

Phase IV: From dedicated to continuous clean-up

The organization will need to gauge the process and determine when to begin cross-training teams in clean-up for all shifts. The transition can begin with extended production days and cycling clean-up among the shifts to build competencies in both sanitation and production. As skill levels progress, work cells develop which are capable of conducting all operations. Let's look at a couple of cases to illustrate.

In a ground meat processing operation, cross-functional work cells reduced total cycle time — shutdown to start-up — to less than three hours. Each member of the work cell went through training in teardown and assembly, sanitation and production. The sequencing of sanitation procedures and self-inspection were established and reinforced daily using work standards and check sheets. The result: a 40 percent increase in productivity and a 25 percent reduction in inventories over two years.


In another case involving an entrée operation, cycle times were reduced by two hours. Assembly and processing specifications were developed for each product and line configuration. Each cell had a “process owner” who was responsible for identifying setup and materials and assigning crew for start-up. Sanitation team members were cross-trained in equipment operation and quality inspection. Within the first year, start-ups were averaging close to 90 minutes before shift changeover.

As skill levels and capacity requirements increase, dedicated third shift cleanup can be replaced with cleanup on demand. Frequencies of cleanups will be determined by either formulation conflicts or microbial activity.

Notice 27-06 underscores the need for a high level of operational sanitation and visual control. Establishments also must routinely evaluate and demonstrate adequate prevention

of product contamination or adulteration. Correlating observations of processing conditions and baseline microbial data should be conducted and retested at regular intervals.

A new consumer need, technology or competitor is always on the horizon. Innovation and continuous improvement must be established to avoid becoming another example of the consequences of failing to grasp change.

The more acquainted you are with lean, the more enticing it becomes. Focusing on customer value and voraciously attacking waste are the cornerstones of lean. When a target level of performance is within reach, a higher performance target is established. Thus, lean is a journey and not a destination. 

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NOTE TO MANAGEMENT

The author chose lean sanitation as a means for introducing the basic concepts of lean management. The tools are pretty straightforward and can be grasped with a modest amount of education.

The benefits make a compelling case for becoming lean — double digit improvements in sales, productivity, inventory turns and ROI are common. However, cherry-picking lean techniques will yield only a fraction of the available benefit. Conducting a couple kaizen events or implementing kanban here or there is not implementing lean.

Lean is a transforming process that requires top executive commitment and company-wide collaboration. Tearing down firmly held beliefs about what customers really want and driving out non-value-added activity in the design, production and delivery of goods and services is a daunting undertaking. But as executives and investors look back on the limited benefits ECR and ERP provided during the past decade, perhaps lean is the critical piece in the equation that is still missing.

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