FOOD FACILITY EFFICIENCY
ASSESSMENTS 101



HOW TO TAKE YOUR FOOD PROCESSING PLANT TO THE NEXT LEVEL BY SAVING MONEY, MITIGATING RISKS, IMPROVING ROI & BUILDING YOUR BUSINESS *for the future.*

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Food Facility Efficiency Assessments 101
How to take your food processing plant to the next level by saving money, mitigating risks, improving ROI and building your business for the future

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INTRODUCTION



FOCUSED ON IMPROVING THE EFFICIENCY OF YOUR SUPPLY CHAIN? ENSURE YOU'RE NOT CREATING *more kinks along the way.*

For food plant owners, improving supply chain efficiency has quickly become top **priority**.

However, some attempts to optimize can result in inefficiencies that permeate the success of your *entire facility.* If you're growing your business, you're *especially* susceptible to these pitfalls.

For example, if you're expanding your product line, taking on a new client or increasing production, your facility will need to adapt to that change. But how do you **grow your facility** and **increase ROI** at the same time?



Ramping up production and distribution can introduce a host of factors that can lead to large-scale inefficiencies throughout your plant. Plus, the right decision isn't just one that meets your needs right now. Whether you're acquiring new customers or manufacturing new products, you must consider the repercussions today's decision will have on your operations years from now.

New business opportunities often happen fast, and you may find yourself having to make a quick decision. Don't get caught off guard. Knowing all your options can help you make the right call when it comes to optimizing your supply chain.

Long story short: An **outside perspective** can make all the difference. You *can* improve the efficiency of your supply chain, but you *must* think higher level. You *must* **change the way you view your supply chain as a whole,** and realize you can make improvements and optimizations long before distribution.

Everything links together.

RECOGNIZE THERE IS THE OPPORTUNITY TO **OPTIMIZE**

If you're focused on improving the efficiency of your supply chain, focus on **improving the efficiency of your facility overall.** What do we mean by "efficiency"? Making improvements and optimizations to:



As the focus and function of your plant has evolved over time, have you evolved everything else with it? **Rapid growth, facility expansions, product line additions, changing regulations and simply the passing of time** all have an overarching impact on your food plant's efficiency, whether it's translated through inadequate machinery, bottlenecks in production flow, food safety risks or unnecessary energy consumption.



Naturally, we all have a desire to do things quickly. However, jumping on quick wins without planning for the future will likely lead to inefficiencies on a larger scale than you anticipated.

If you want to *truly* improve your food plant, then you must carry **the least amount of low-hanging fruit inefficiencies.**

But where are these inefficiencies? How do you find them—and fix them?

WHAT IS A **FACILITY ASSESSMENT?**





... A CRUCIAL TOOL THAT HELPS YOU IMPROVE THE *efficiency of your food plant.*

A facility assessment is a crucial tool that helps you improve the efficiency of your food plant.

As a comprehensive analysis of your food plant, a facility assessment identifies key areas where you can save **money,** increase **safety,** streamline **production** and decrease **risk.** This tool allows you to optimize a process based on hard data to make justifiable, educated decisions instead of relying on guesswork, best estimates or your gut.







WHAT TYPES OF PLANTS SHOULD COMPLETE A FACILITY ASSESSMENT? **AND WHEN?**

Whether they were built 30 years ago or one year ago, **food production, manufacturing and distribution** facilities are all an ideal fit for facility assessments.

When a plant is erected, the focus is often on upfront costs, **not** long-term ROI. A facility assessment allows you to see how those initial decisions may be impacting your plant's efficiencies and where improvements can be made—no matter your facility's age.

If you have a newly built plant, a facility assessment can also help you measure your *actual* versus your *predicted* energy consumption. It can give you peace of mind that your facility is running as expected.

HOW DOES A FACILITY ASSESSMENT **WORK?**

Conducted in partnership with a third party, a facility assessment involves carefully inspecting each step and process of your food plant to **identify risks and inefficiencies.**

The third party then analyzes and interprets that data into unbiased, actionable items you can use to power your plant into a better facility tomorrow than it is today.

Facility assessments evaluate two key factors: **reliability and payback—in other words, your rate of return on investment.**

reliabilty & payback



ESTABLISH YOUR BENCHMARK FROM THE VERY BEGINNING.

Most companies have internal guidelines for what they think their rate of return should be. You *must* share this with your facility assessment team before getting started. Before you begin your facility assessment, determine **how your company defines success**. What are your initiatives? Is it to decrease personnel? These goals will establish the focus of the facility assessment, ensuring optimizations align with your company's strategic focus.

6 WAYS A FACILITY ASSESSMENT CAN BENEFIT YOUR BUSINESS



1: **MANAGE & MITIGATE RISK —** Learn *where* potential risks exist in your plant to create proactive *solutions* versus reactive *responses*.

2: **IDENTIFY INEFFICIENCIES —** Discover what's bogging your plant down.

3: **REDUCE COSTS —** Understand what can be improved, or cut completely, to save you money.

4: **INCREASE ROI —** Identify what equipment and optimizations will best position your plant for long-term gains.

5: **IDENTIFY NON-COMPLIANCES —** Ensure your plant adheres to (and exceeds) minimum requirements set by industry organizations like OSHA, FDA and SQF.

6: **OPTIMIZE PROCESSES —** Recognize how, and where, you can fine-tune and streamline processes to increase productivity and efficiency.

WHAT ARE THE RISKS OF **NOT** CONDUCTING A FACILITY ASSESSMENT?

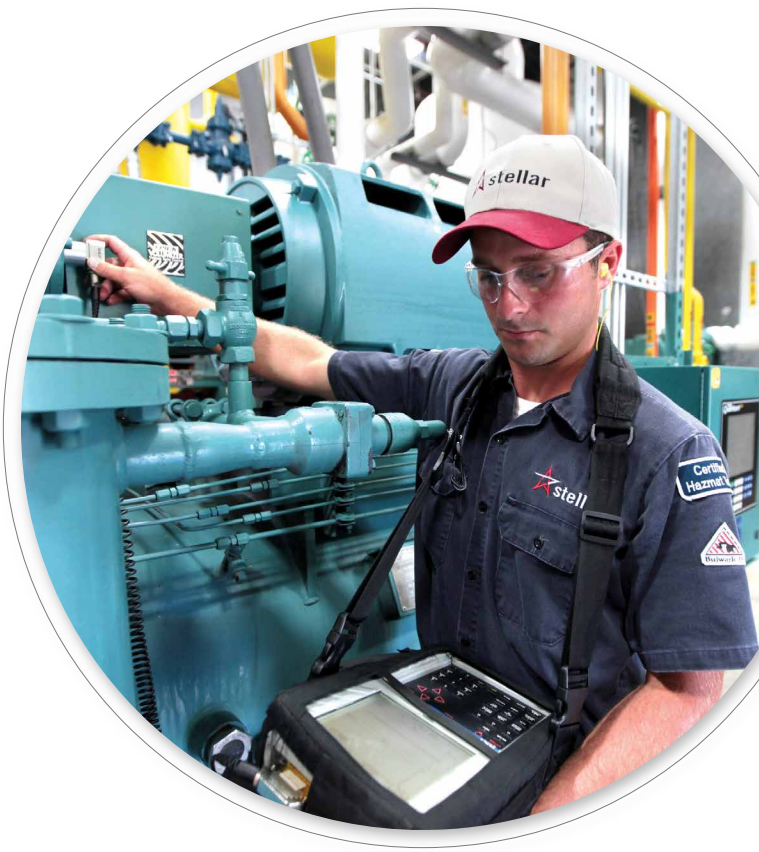
What if you don't perform a facility assessment? You risk suffering the **costs of being:**

REACTIVE vs. PROACTIVE

If you don't conduct a facility assessment, you could potentially be exposing your facility to:

- **Recalls**
- **Food and personnel safety hazards**
- **Failed audits**
- **Unnecessary costs**
- **Plant shutdowns**
- **Failed industry compliance**
- **Process inefficiencies**
- **Losing your competitiveness**

During a facility assessment, plant owners are provided with **real-life, actionable solutions to optimize processes and decrease risks, proactively protecting you and your facility.**



THE FOUNDATION FOR AN **ACCURATE ASSESSMENT**



WHO SHOULD *conduct* YOUR FACILITY ASSESSMENT?

Remember, a facility assessment is **not** a compliance audit. When selecting a partner to conduct your assessment, engage a firm that can provide knowledge beyond *compliance*.

To get your plant to the next level—running with **increased efficiencies and decreased risk**—you must select a top-notch team.

The optimal team is an unbiased, **independent third party** that can provide an in-depth, accurate analysis of your food facility. An accurate analysis is facilitated by a firm not only experienced in food facilities, but in your *type* of food facility and industry.

5 ESSENTIAL QUALITIES
OF AN OPTIMAL FACILITY ASSESSMENT PARTNER

1: FOOD INDUSTRY EXPERTISE AND EXPERIENCE — Whether you run a meat business or a bakery, your operations, equipment and processes are extremely unique. A partner who understands these pieces of your business is imperative to performing a proper facility assessment.

A firm with experience across *multiple* food sectors—from bakery, beef/pork, poultry, dairy, beverage, ready-to-eat, frozen and seafood—can be extremely valuable. They can leverage everything they've learned in multiple markets to develop well-rounded recommendations for you.

2: UNDERSTANDING OF ALL PLANT ASPECTS — Beyond food industry expertise, it's crucial to partner with a firm who understands the ins and outs of a manufacturing plant. From the processing lines to the building envelope and design, a consultant who truly knows every nook and cranny of a facility is integral to a sound assessment, ensuring no stone is left unturned.

Consider the consultant who has not only operated facilities, but along with their plant experience, can also design and build them.

3: A STRONG NETWORK — While it's important to work with a strategic-planning partner who can provide a comprehensive offering, strategic planning is wide-ranging, and no consultant will offer every single needed expertise under one roof. This is where extensive food industry experience is crucial, as your strategic-planning partner should have many partners of its own.

Because a strategic plan is the sum of many moving parts, a partner who can tap into resources and market knowledge to maximize your ROI for the future is invaluable. Look for a partner with seasoned experience, boasting a strong network of expert partners within your industry.

4: OBJECTIVITY — Every company has its own culture—and biases. While internal teams may be driven by their own prerogatives and agendas, having a third party come in offers a safe buffer. You can ensure your facility will be assessed truthfully and accurately.

5: A SENSE OF URGENCY — Your team is busy doing what it takes to make money *today*, not devoting resources to drive the *future*. A facility assessment allows you to continue normal operations while focusing on moving you forward. Time is of the essence—the faster you assess your facility, the faster you can optimize. Your partner should be well-versed in planning and scheduling, armed with a true understanding of efficient project management. They must have a sense of urgency, armed and ready to get your business where it needs to be—and fast.

KEY PLAYERS TO INVOLVE FROM YOUR FOOD FACILITY

An effective facility assessment is a group effort—a partnership between your food facility staff and your third-party assessment team.

To garner the best knowledge to drive your assessment, engage the following individuals from your food facility:

- **Plant management**
- **Corporate sponsor (if applicable)**
- **Product quality team**
- **Maintenance team**
- **Development team**
- **Sanitation/food safety/quality assurance group**



Remember (and reiterate): Everyone is on the same team. This can often be misconstrued when you engage a third-party facility assessment partner. Your plant personnel may think you've engaged a team to judge their performance or criticize their decision-making. This is not the case. Ensure your internal team **understands the goals, is open to change and is honest in their conversations with your assessment partner.**

At the end of the day, everyone must be driven by the same core goal: to make your food facility better *tomorrow* than it is *today*.

START WITH A **HIGH-LEVEL DISCUSSION** ABOUT YOUR WEAKNESSES

A facility assessment uses the **aggregate knowledge of your team to address the inefficiencies and risks that could be thwarting your plant's success.**

To unveil this knowledge, the optimization process must kick off with a **high-level discussion about your plant's pain points** (and your own). Where do you feel you can't keep up? What are areas you think can be improved right off the bat? Does your facility have a history of injuries?

Throughout the facility assessment, your third-party partner will walk through your plant's many steps to answer key questions, such as:



Open your team to observations and open discussions with the third-party assessment team to *best answer* these questions—and better your facility. You'll get out of it what you put in.

3 KEY AREAS TO ASSESS FOR INEFFICIENCIES AND RISK WITHIN YOUR FOOD FACILITY:

1 **FOOD SAFETY** 12

Compliance is the lowest bar. Examine food safety flaws and opportunities for improvement to avoid the ultimate risk: a recall.

2 **PROCESSING/OEE (OPERATING EQUIPMENT EFFICIENCY)** 17

Learn how to analyze the right processing data against a processing schedule to unveil how you can cut costs and increase output.

3 **ENERGY CONSUMPTION (WATER, ELECTRICITY & REFRIGERATION)** 22

Discover how to achieve energy efficiency that translates to long-term ROI, not frivolous spending.

1: ASSESS & OPTIMIZE: **FOOD SAFETY**

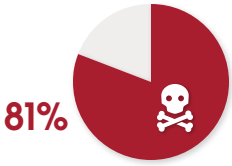




MERELY COMPLYING IS *not enough.*

You already understand that food safety is **non-negotiable.** But it's critical you also understand that merely *complying* is the **lowest bar.** "Good enough" does not cut it with food safety.

In a food plant, a recall is worst-case scenario—and a recall is rooted in food safety risks and inefficiencies.



Suffering from a recall is an exhausting, encompassing, expensive process. Aside from endangering your customers, you risk endangering your company's future. According to an Ernst and Young survey, **81 percent of manufacturers believe the financial risks of a recall are "significant to catastrophic."** And they are, given the average estimated cost of a recall is between $9-29 million.



The exact expenses involved in a recall can be difficult to quantify given all of the intangible costs at hand, such as losing consumer trust. A Harris Interactive poll shows that 15 percent of consumers **never return** to a product that has been recalled.

If your food is deemed unsafe, the costs of the aftermath are not cheap. Your value falls, and consumers may even migrate to a competitor's version. At the same time, a recall has a ripple effect on the entire market—even if it doesn't come from your brand.

For example, if a competitor's frozen hot dogs are recalled, you may find that your own frozen hot dog sales begin sinking. Consumers are now weary and untrusting of frozen hot dogs because of the recall, worried about the safety of not only themselves, but of their families, as well. A recall could lead to the worst loss of all: going out of business.



CAN YOU RISK A RECALL?

When deciding whether or not to invest the money in a facility assessment, ask yourself: **What is the cost of doing nothing?**

Can you afford to potentially lose up to 15 percent of your customers? Can you afford the millions of dollars lost to a recall? The cost of analyzing your risks is exponentially cheaper than the risks translating to the realities of a recall. You must be proactive—you owe it to your customers.

MANAGE & MITIGATE FOOD SAFETY RISKS BY **ANALYZING PRODUCT FLOW**

Food safety encompasses every aspect of your food plant from personnel to equipment to ingredients and processes. Your facility must have the **right processes and methods in place to execute food safety practices throughout every stage of your plant.**



With so many moving parts, it is vital to strategically plan your approach, **including the products you make, the ingredients that comprise these products as well as packaging materials and the processes it takes to get it out the door.** Assessing all of these areas creates a recipe for an optimized outcome.

Manage and mitigate your plant's food safety risks through a sound, structured approach in your facility assessment by analyzing your product flow.

In your assessment, your team should follow the flow of your product, from raw materials to packaged products, analyzing the weaknesses—or areas of opportunity—within each operational step.

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5 FOCUS AREAS FOR ASSESSING FOOD SAFETY RISKS

To best assess food safety risks, your team should focus on the following areas and best practices in your facility assessment:

1: SEPARATION OF ALLERGENS



Allergen-friendly products, such as gluten-free items, are overwhelming today's marketplace. One in five Americans (20 percent) actively try to incorporate gluten-free foods into their diet. The demand is high, and food processors are adjusting their product lines to adapt to these niche customers.

If you've opted to incorporate allergen-free products into *your* facility, avoiding cross-contamination is especially critical.

In your facility assessment, analyze the start of your supply chain—before raw ingredients arrive to your facility. You should be engaging **suppliers certified by a third-party allergen expert** to ensure your ingredients don't contain trace amounts of allergens.

Once the ingredients arrive to your facility, verify the segregation of storage areas. Even *dust particles* from allergen ingredients can contaminate allergen-free products.

When examining processing, are you using a **dedicated allergen line?** If not, a facility assessment can help identify how you can **reconfigure existing production areas** to incorporate one.

If it's *not* feasible for your plant to incorporate dedicated product lines, you team may consider **optimizations through the product schedule,** planning non-allergenic product production first, followed by allergen-present products. A scheduling matrix can help minimize clean-in-place (CIP) and changeover time between batches.

Examine your personnel's behaviors during your assessment, as well. Your plant staff should be following best practices for handling allergen-free foods, including:

- **Changing gloves and/or aprons when necessary**
- **Utilizing proper sanitation**
- **Sanitizing equipment thoroughly**
- **Testing for allergens frequently**



2: FOOD-SAFE SURFACES & MATERIALS

Installing and maintaining proper surfaces within your food plant is critical for facilitating a food-safe environment.

Are you **utilizing stainless steel or solid aluminum** on plant surfaces? These two materials are ideal for food safety, because they are conducive to easy cleaning and sanitation. Where are some areas in your plant that you could install such surfaces?

If you already use these materials within your plant, verify they were **installed with proper slopes** to eliminate the ponding of water (which can foster bacteria growth).

3: AIR PRESSURE & FLOW

Achieving the optimal air balance within different areas of your food facility is critical to eliminating the potential for contamination.

During your facility assessment, confirm air pressure within your facility doesn't allow for significant pressure differences. **Unwanted moisture and condensation** can wreck havoc in areas where sanitation is tightly controlled. Condensation allows moisture to gather in equipment crevices and on ledges, leading to bacteria and microbial growth. Appropriate air balance, however, can eliminate the potential for moisture and condensation. Proper air flow and balance also eliminates the potential for airborne dust particles and contaminants to reach processing areas. Food plants (such as meat-processing facilities) have the potential for especially dangerous airborne contaminants such as E. Coli.

Note the **direction and frequency of airflow** in your assessment. For example, the air from kill floors and rendering areas, where raw poultry and meat are handled, must *never* flow to areas such as packaging, where airborne bacteria could infect the final product. Your assessment can reveal what modifications you can make to **promote appropriate air pressure and flow,** eliminating opportunities for condensation and pathogen growth.

4: PLANT PERSONNEL

Human error could be the catalyst to a large-scale recall. A culture of consistent, **thorough sanitation practices** should shine through your food plant personnel from the inside, out.

In your facility assessment, answer questions regarding your plant's food safety culture, such as:



- **Do you employ stringent uniform and locker room standards to minimize airborne contaminants from outside the plant?**
- **What type of garments do you offer employees?**

Employees should only have access to their specific work center during operation hours to prevent cross-contamination. An employee working with raw ingredients, for example, shouldn't have the ability to access the ready-to-eat (RTE) processing area. Electronic bar codes on badges can provide real-time tracking to monitor where and when a potential threshold breach has occurred, allowing your plant to react instantly by stopping a line or pulling a product.

Your **employees should be trained** to perform *multiple* sanitation procedures so best practices transfer from one department to another.

Are there clear areas of improvement with your plant personnel based on the above information?

5: PACKAGING

Packaging requires its own food-safety considerations. Is your packaging method sanitary and safe for consumers? Are there alternative packaging methods that would better suit your product?

For example, if your plant produces a meat product, consider **secondary packaging**. This method is more efficient, and it improves product integrity because it keeps the product as cool as possible for as long as possible.

Sometimes food safety in packaging takes the form of efficient practices to cut down on how long your product is out in the open after processing. A facility assessment can help you develop an efficient layout that decreases the product's travel time across your plant, reducing food safety risks.



CASE STUDY:

ROYAL CUP FACILITY ASSESSMENT



ROYAL CUP®
COFFEE AND TEA

Stellar recently conducted a facility assessment for specialty coffee and fine tea producer Royal Cup. Royal Cup was finding its clients, and prospective clients, were increasingly requiring the globally recognized Safe Quality Food (SQF) certification program to verify food safety standards in the plant. During our assessment, Stellar found opportunities to optimize Royal Cup's food safety initiative.

1: **REPLACING BUILDING INSULATION —** We removed bag insulation and installed new rigid insulation on top of the existing roof decking, finishing it with a TPO membrane.

2: **PREVENTING FLAVOR CROSS-CONTAMINATION —** Stellar transformed the flavor room into a washdown area with the highest level of food safety standards, allowing equipment to be taken into the washdown area for thorough sanitation to reduce flavor cross-contamination.

3: **ENHANCING AIRFLOW —** Stellar specified and installed new air handling equipment in all new and renovated areas to provide sufficient filtered air and create a positive pressure.

4: **UPGRADING DUST MANAGEMENT SYSTEM —** We specified and installed several new dust collection systems for all dust-generating operations to reduce dust-related issues in the facility.

5: **IMPROVING EASE OF CLEAN-UP —** To improve cleanability, we installed central vacuum receivers on the ground level and ran vacuum lines to the various cleaning locations on the equipment platforms and mezzanines.

optimize food safety

2: ASSESS & OPTIMIZE: **PROCESSING & OPERATING EQUIPMENT EFFICIENCY (OEE)**





ELIMINATE COSTS THROUGH *process optimization.*

Operating a food manufacturing facility is *expensive*. You know this. On top of that, you're getting squeezed by your customers. You must eliminate unnecessary costs to remain viable. The best way to do this? Optimize your processes.

However, the advances in equipment technology have created an excessive amount of data at each point during processing. While there may be tons of data at your fingertips, most of the time, **you don't have all the data you need.** Furthermore, you likely don't know how to **properly analyze that data against a processing schedule.**

When you are equipped to examine your processes as a whole through a facility assessment, you become empowered to optimize by assessing:

- **Material flow**
- **How to streamline operations**
- **How to add capacity efficiently**
- **Quick changeovers**
- **Personnel and plant traffic**
- **Automation**
- **Equipment efficiency**
- **Your supply chain**

Your facility assessment will help you **translate the cost of processing inefficiencies** you may not have realized before.



When Stellar conducted our facility assessment of Royal Cup, we discovered major traffic flow problems. From personnel and forklifts to product and trucks, there was congestion throughout the facility. Stellar was able to provide external insight that those working in the plant day-to-day were unable to see. We were then able to determine how eliminating these inefficiencies would impact Royal Cup's bottom line.

ROYAL CUP® COFFEE AND TEA

6 KEY PROCESSING DATA TO ASSESS FOR EFFICIENCIES:

- ☑ **Current production —** How many units of product are you producing daily?
- ☑ **Capacity —** What is your projected level of capacity? What is your actual level of capacity?
- ☑ **SKUs —** How many SKUs are you currently producing? Is it possible to eliminate any?
- ☑ **Packaging materials against the SKUs/Types of packaging** — How many changeovers occur in your packaging? Would a different type of packaging facilitate longer product shelf life?
- ☑ **Current equipment capacity/Market growth projections against current equipment capacity —** Can your current equipment handle your facility's long-term goals?
- ☑ **Product mixes —** What are your most successful SKUs? Do you have the capacity to properly produce these lines? How much equipment do you need?

LOOK AT YOUR PROCESSES AS A WHOLE—**DON'T GET CAUGHT UP IN THE DETAILS**

As a plant owner, you likely get caught up in the details. When trying to optimize your processes in the past, you may have been focusing on *one little piece,* such as a changeover. But you can identify the *best areas of opportunity and optimization* if you start by looking **at your entire process portfolio.**

A facility assessment allows you to take a step back and evaluate the processes that make up your plant's hectic day-to-day—*as a whole*—and then dive into the details. By looking at the big picture and then narrowing in, a third-party assessment team can catch all opportunities for improved efficiency.

STUDY YOUR FOOD PLANT'S MATERIAL, PERSONNEL AND TRAFFIC FLOW

First and foremost, identify what is manual and what is automated in your facility.

Keep in mind, ***automating* does not always equal *improving*.** Just because a process *can* be automated doesn't mean it *should* be automated. In fact, when assessing your facility for automation, you may find that certain manual processes can be bettered without automation.

For instance, an additional work shift may solve an efficiency problem more effectively than new equipment. In some cases, it may even be more cost-effective.



MANUAL

VS.



AUTOMATED

Determining which processes can be automated varies plant by plant and is **heavily dependent on your ROI goals.**

Total automation seems like an ideal, but it can be difficult to determine how to connect every system in a food plant—or if they should even be connected at all. To optimize ROI, it's important to learn **which areas of your food processing facility are best suited for automation,** which is case by case, clarified in your assessment.

MAKE WAY: FREE UP TRAFFIC PATTERNS



Examine where your plant experiences **congestion,** whether it's in the form of people, equipment or product.

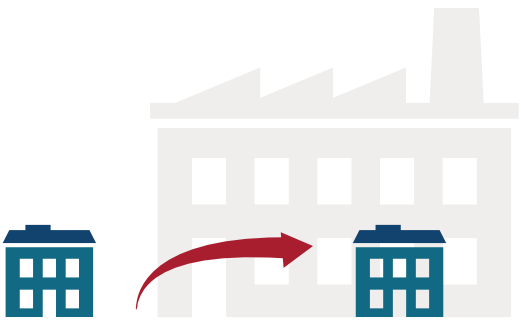
Some traffic inefficiencies can be attributed to habit, such as "shortcuts" to different parts of your facility. Others may have evolved over time, such as forklift paths that no longer make sense for your current configuration.

During a facility assessment, your third-party team should address changing these small daily practices that can result in blocked plant flow. For example, physical barriers such as interior walls and doors could be strategically installed to isolate critical zones and limit traffic between work centers.

DECREASE WORKER INJURIES BY IDENTIFYING **SAFETY RISKS**

Facility assessments not only examine safety from a product perspective, but from a personnel perspective. From an ergonomic standpoint, link up with your human resources or safety team to **gather data about the types of injuries that have occurred in your facility.** Are there any consistencies? What can you do to minimize these risks? Or were the incidents a one-time occurrence?

Seek to address these risks during your evaluation.

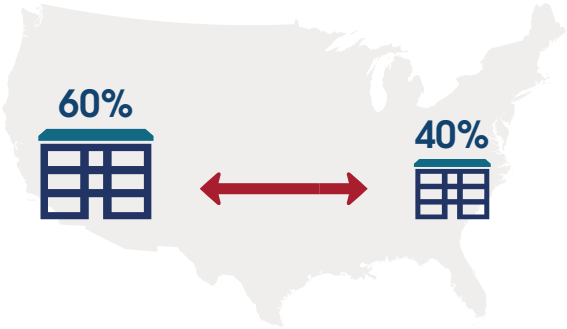


ARE YOU GROWING AND RUNNING OUT OF SPACE? **PRIORITIZE ADDING CAPACITY *EFFICIENTLY*.**

As your food company grows, you may be finding **you've outgrown your facility or that you aren't running at maximum capacity.**

Your facility assessment can help determine how to add capacity efficiently by **weighing costs related to labor and your supply chain**.

For example, say you operate a facility on the West Coast and have increased your business on the East Coast. If 40 percent of your business is on the East Coast, that is likely enough to justify another facility. You will have to weigh the cost of transporting such a large percentage of goods against the operational costs of a new facility.



FIND THE **SWEET SPOT** BETWEEN ROI AND SHELF LIFE.

Can you facilitate a **longer shelf life** for your products by optimizing packaging? Obviously, the longer a product can sit on a shelf, the larger your ROI. This direct relationship relies, to some extent, on your packaging. Different materials have various impact on the food within.

For example, a bag with holes will have faster degradation with exposure to the atmosphere. One way to keep bagged food fresh is with scaff flushing, or filling a bag with gas like CO_2.

Think outside of the box.



CAN YOUR FACILITY EASILY REACT TO CHANGING CONSUMER PREFERENCES THROUGH **QUICK CHANGEOVERS?**

Consumer preferences change—frequently. They crave more variety, and for your processing, that translates to quick changeovers.

But flexibility costs *money,* and there's a fine line between *flexible* and *dedicated*. The optimal balance is found in being **flexible enough without spending too much capital.**

In your facility assessment, determine what processes are *mandatory* to your plant's operations. In other words, what *must* stay? What's mandatory to keeping your food plant profitable? Weigh **your flexibility capacity against your operations.**



It's critical to shut down for sanitation and line changes to improve operating equipment efficiency (OEE). If your facility has a four-hour daily window for sanitation, you may struggle to fit flexibilities within this window. However, if you are willing to adjust to six hours of cleaning, your capabilities may change. Data can help plant owners make schedule modifications that can impact processing capabilities.

A facility assessment can help optimize these shutdown periods to reduce downtime while still effectively sanitizing and conducting line changes. You may find that it's your equipment that isn't operating efficiently. Can a better, newer piece of equipment make a real difference? How much of an impact could that have for your facility's output? Keep these questions in mind during your assessment.

5Q'S TO ASK ABOUT YOUR SKUs

The food and beverage industry is driven by stringent consumer demands, whether it's adjusting to preferences for sophisticated tastes, speciality ingredients or preparations (think: gluten-free, non-GMO, Kosher, etc.). Outside of tastes, you must also adapt by offering flexible packaging and convenient serving sizes.

As a result, food manufacturers often find themselves saddled with too many different products, or SKUs, in their efforts to please and appease customers. However, too many SKUs can drag down profits with frequent changeovers that drive up production costs and decrease throughput.

If you find your plant is experiencing an abundance of SKUs, ask the questions below to discover where you should focus your attention and processing efforts.

1: **WHAT ARE YOUR PRODUCT LINES?** Define the products and flavors your facility produces. What is the *market success* of each? What does the *health of the market* tell you about customer preferences surrounding your product lines?

2: **WHAT ARE YOUR SKUs' PRODUCTION RATES?** How many of each SKU do you produce? What is your changeover schedule? Are some SKUs processed faster than others?

3: **WHAT ARE YOUR IDEAL SKUs' PRODUCTION RATES?** Best-case scenario, at what rate should your equipment be producing each product line and SKU?

4: **DO YOUR CASE SIZES MATCH YOUR SKUs?** Identify opportunities to reduce your packaging needs, whether it's through case-size consolidation, online printing or label application.

5: **WHAT ARE YOUR A, B, C, D RUNNERS?** For example, if your plant produces multiple product lines, you may make equipment decisions based on line capacity. Most require three case erectors for each line. So, if you have five lines, you are working with an expensive piece of equipment.

Determining what to produce on each line (and when) requires a thorough understanding of your capacity and SKU success. However, if your concern is flexibility, you might install two lines that serve one purpose while two lines serve another. When working between multiple SKUS, these lines will allow for easier scheduling and changeovers. The decisions you make to optimize your facility are based on where your priorities lie.



ROYAL CUP COFFEE AND TEA

As a smaller, family-owned business, Stellar's client Royal Cup was experiencing an increase in demand from a growing customer base; however its current operations hadn't yet evolved to support that growth. Royal Cup was operating out of three different buildings, requiring trucks to transport work in process between various facilities on the campus.

To optimize traffic flow, Stellar linked all of Royal Cup's facilities together. We built connection bridges to transport goods and materials between facilities, reducing on-campus traffic. By consolidating production efforts, Royal Cup could efficiently operate from *one interconnected* facility instead of *three*. This redesign of the campus resulted in **a linear product flow** that streamlined the coffee beans' journey from raw material to final, packaged product. This optimized flow supports greater speed and efficiency.

3: ASSESS & OPTIMIZE: **ENERGY CONSUMPTION (WATER, ELECTRICITY & REFRIGERATION)**





IS IT POSSIBLE TO GO *too green?*

Energy costs typically account for 30 percent of a facility's operating budget. Your **water, electricity and refrigeration** represent key areas of opportunity to *cut costs* and r*educe inefficiencies* and waste.

But with a focus on LEED and eco-friendliness, can you also go t*oo green?* The short answer is **yes**. When it comes to energy consumption, you also must ensure your facility isn't going overboard with efficiencies which leads to unnecessary costs.

And with all of this in mind, you also must **achieve necessary safety requirements**. Remember, with energy consumption, there are safety risks if you attempt to cut too much. Take OSHA's **minimum requirement on lighting**. If you want to save on electricity, you still must ensure your lighting levels comply.



UTILIZE YOUR UTILITY BILLS

The most efficient way to evaluate plant and power efficiencies is to examine energy bills over a 12-month period. This time frame is necessary because it follows your plant's operations through all four seasons, allowing you to discover outlier information such as:

- **Are there energy spikes in some months versus others?**
- **Are there differences in operations during these times?**
- **Are there system inefficiencies?**
- **How is the plant being operated during these months?**

Establish a baseline for your energy goals through your facility assessment. If your building were to run at maximum optimization, what would your energy bills look like?

START WITH THE SKELETON: **THE THERMAL ENVELOPE**



Thermal envelope weaknesses are one of **the most common causes of energy inefficiencies**. Your entire building envelope, from the windows to the doors, must be tightly sealed to achieve the utmost energy savings. Why? In an otherwise well-insulated and well-designed facility, something as seemingly small as an improperly designed door opening can erase a significant portion of energy and utility efficiencies. **An airtight envelope not only reduces energy costs, but also helps mitigate pollutant infiltration and cross-contamination.**



If your facility is a bit older, you can evaluate the strength of the thermal envelope by checking for air leaks. Older facilities are more at risk for vapor leaks or frosting issues, which can waste energy and increase utility costs.

Keep in mind, **facilities gain the most heat through their walls and ceilings**—this is why proper insulation is so critical. Ensuring your plant is using materials that repel heat can greatly reduce long-term energy costs. Insulated metal panels (or IMPs) have a high R-Value (measure of thermal resistance) and low thermal conductivity, which provide your building with a superior thermal performance. IMPs create continuous insulation, ensuring no gaps or pockets are left unprotected, even around panel joints. IMPs are also simple to detail and attach, which reduces scheduling and installation errors.

The materials your plant uses in its thermal envelope will impact how well your mechanical systems work, as well as your refrigeration and electrical production.

IDENTIFY WAYS TO **CONSERVE WATER**

From processing to sanitation, food plants use massive quantities of water. Because the cost of water and sewer fees continues to rise, it's important to focus on decreasing costs and inefficiencies through **conserving water**.

Most water loss occurs during the sanitation process. **High-pressure, low-volume nozzles on spray washers and other flow restrictions can significantly reduce the amount of water used and lost during washdowns.** During your facility assessment, examine if these elements could optimize your sanitation.

Installing **water softeners or filtration systems** is also one of the easiest, most cost-effective solutions to purify water and reduce energy usage. Cleaner water helps minimize waste and the expense of treatment at municipal facilities and protects your equipment. Look for these opportunities.

Keep an eye out for small flaws that could make a big difference, as well, such as leaking water hoses or leaking pipes where compressed air may be escaping. Small fixes could offer huge paybacks.



3 INNOVATIVE WATER CONSERVATION TECHNIQUES:

1

Reuse processing water for external sanitation.

Water is often used to heat up or cool down a food product without coming in direct contact with it. Food processors can retain this water for cleaning items such as trucks, pallets and trolleys.

2

Use a water catchment system.

Rather than allowing rainwater to drain into the ground, have a water catchment system pipe it into reservoirs to be used for things like irrigation and fire sprinklers.

3

Install flow meters on process equipment.

A water control unit, or flow meter, helps ensure process equipment only uses a minimum quantity of water. It can regulate either flow rate or total volume, based on the equipment's function.

SAVE ELECTRICITY THROUGH STRATEGIC PLACEMENTS

The electricity your facility uses is heavily dependent on the other aspects of your plant, like the thermal quality of a building envelope or mechanical ventilation.

After you've analyzed those pieces, focus on your **equipment location**. The location of your plant's electrical equipment can greatly affect its lifespan. For example, locating electrical equipment, either in production spaces or adjacent areas with little protection, typically results in failure at one point or another. This is especially true with wet-type process areas with heavy washdown requirements. There might be consequences for locating electrical equipment in dry, dusty areas of the plant. You could experience a line or plant shutdown if you don't perform routine maintenance and cleaning on the equipment.

OPTIMIZE YOUR LIGHTING

Lighting is an independent feature that is not heavily integrated with other utilities. In your facility assessment, your team should take light readings of your entire plant.

When looking for optimizations, be mindful that certain fixtures are a better fit for certain areas of your facility. For example, **LED is ideal for warehouses and processing areas**, while cheaper **fluorescent is a best for employee areas and packaging**.



WHEN ASSESSING LIGHTING, EXAMINE:

- Age of your system
- Technology (High-pressure sodium? Fluorescent? LED? Metal sodium?)
- Placement
- Light levels
- Maintenance (Are they kept clean from debris? Yellowing of lenses?)
- Controls

DON'T **OVERWORK** YOUR REFRIGERATION

Industrial refrigeration accounts for up to 60 percent of a manufacturing facility's total operating expenses.

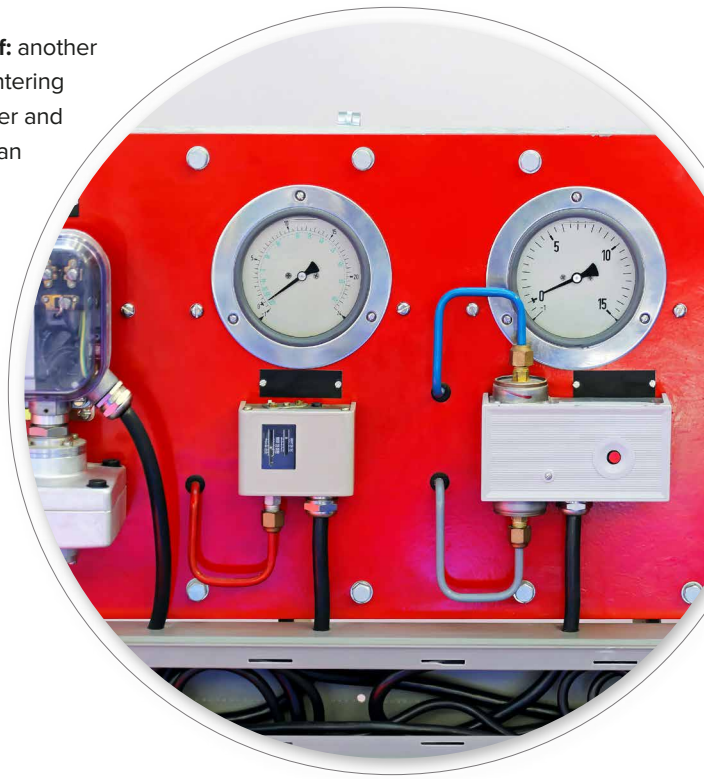


Oftentimes, refrigeration systems are unnecessarily working at full capacity. All aspects of refrigeration equipment—**compressor, condenser, evaporator and air unit selection, variable frequency drives (VFDs) and premium-efficiency motors**—can affect a refrigeration system's efficiency. Examine these pieces during your assessment.

You can also experience energy savings by **reducing the temperature in your refrigeration room** by improving lights and engines, installing proper doors and facilitating minimal foot traffic.

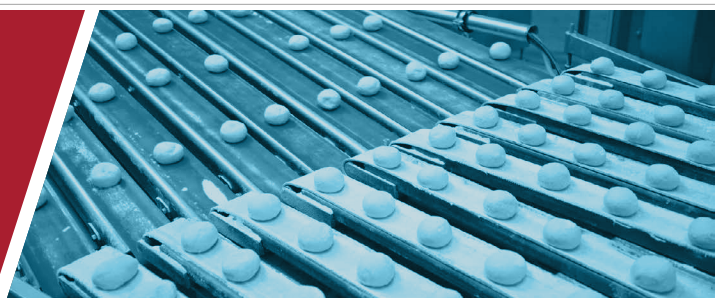
Outside factors can also impact refrigeration cost and energy, from operators to outdoor temperatures. Operators of 20 or 30-year-old facilities may be properly operating the equipment, but not as efficiently as they could be, depending on factors specific to your plant environment.

Don't forget to **inspect the air handling units on your roof:** another element that can affect the amount of outside air that is entering your space, impacting efficiency. It's expensive to cool, filter and dehumidify outside air. Don't work your systems harder than they need to. Focus on the compliance requirements for your facility size, and ensure you're not overdoing it.



WHAT'S NEXT: ACTION ITEMS AFTER YOUR FOOD FACILITY ASSESSMENT





PRIORITIZE *proactivity* TO IMPROVE YOUR FOOD FACILITY, INCREASE SAVINGS & IMPROVE SAFETY.

After you've completed your facility assessment, you'll be armed with the optimizations and changes you need to make to:



It's now up to you to follow through and *optimize* based on the findings and recommendations.

To keep a finger on the pulse of your facility's efficiencies and performance, strive to conduct a thorough facility assessment once every **three-to-five years.** This rate can be determined during the initial assessment (longer if you had minimal inefficiencies, shorter if you had many).

Between assessments, you can even develop a monthly checklist to promote a facility-wide focus on optimization and efficiency consistently.

ABOUT STELLAR

Stellar is a fully integrated design, engineering, construction and mechanical services firm that provides the industry's most comprehensive range of self-performed services. More than 600 Stellar employees worldwide create food processing plants, refrigerated warehouses, distribution centers, commercial buildings and military facilities. In addition to its Jacksonville, Florida, headquarters, Stellar operates tactical support locations and offices throughout the United States and across the world.

GLOBAL POWERHOUSE IN FOOD PROCESSING

Ranked one of the top food processing design-build firms in the world, Stellar's experts are cross-trained in all market segments, with experience in the bakery, beef/pork, poultry, dairy, beverage, bakery, ready-to-eat, frozen and seafood sectors.

HELPING RAISE FOOD PLANTS TO THE **NEXT LEVEL, WORLDWIDE**

Powered by 30+ years of food processing and industry expertise, Stellar has conducted facility assessments for food and beverage companies of various sizes, from small mom-and-pops to international industry giants. We combine our experts' academic and operational backgrounds with design, process engineering and construction knowledge to provide insights that move facilities forward. In our facility assessments, we analyze three key areas: food safety, energy consumption and processing. Stellar's team looks beyond compliance, focusing on solutions that help plant owners manage and mitigate risks, identify inefficiencies, reduce costs, increase ROI and optimize processes.

TO DETERMINE HOW YOU CAN TAKE THE FIRST STEP TO OPTIMIZING YOUR FACILITY, SCHEDULE A FREE, NO-OBLIGATION CONSULTATION WITH ONE OF OUR EXPERTS **HERE**.

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