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BETTER BY DESIGN



Food processing improvements

5 ways to improve food production efficiency

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Within the food sector, processing improvements can have a major impact on costs and profitability of operations. In this guide we look at five key activities that we have observed whilst operating within the sector:

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1. Preventative Maintenance



In the food processing industry the optimising of machine running times is a major issue.

Within the food sector often if a machine suddenly fails, an entire batch can be lost. This is not only expensive but can also be damaging or have implications on productivity.

Maintain for Optimum Performance

The purpose of preventive maintenance is to attempt to maintain the equipment in optimum working condition and to prevent any unplanned downtime due to breakdowns. It is quirky that breakdowns often occur at that critical point in time when you are desperately trying to fulfill orders for your most important customers.

Check and Measure

Preventive maintenance can include measuring and checking components as well as the replacement of various components just as you would replace the filters and belts on your car. The rationale for this is that over time everything wears and the costs of replacing some items prior to actual failure are far less than the potential consequences of failure whilst operating. For example a car engine could suffer significant damage if the cam timing belt broke, and you would incur far greater expense than if you had just replaced the belt prior to failure.

Regular checks can also identify trends where machines are heading towards the boundary of acceptable operating tolerances. This subtle variation in performance will often be an early indication of wear within the machines and could highlight possible failures before they become disruptive.

False Economy

Some people view the maintenance function as an expense, meaning it is often one of the first departments to suffer from cuts when times become difficult. However we believe this is very much a false economy as the money spent on preventing problems from occurring will almost always be far less than the costs you will incur due to actual failures.

The challenge of Scheduling Planned Preventive Maintenance

Within many food processing companies there are departments responsible for maintenance, their role is to define a planned preventive maintenance program in liaison with the production and scheduling departments to have machines released on a regular basis to enable the maintenance work to be carried out.

Unfortunately planned preventive maintenance programs can often be a bone of contention between the different departments with “busy and stretched” production departments often refusing to release machines due to the need to meet customer demand. However, often the reason for being so busy is the result of having to work around delays and quality problems caused through unreliable machines that are underperforming as they need a service.

Food for Thought

It is important that planned maintenance is seen as necessary and machines released when they are required, in the long run this will ease the burden on the production as machines should be more reliable and more efficient.

It is often difficult to justify “just in case” expenditure and it is all too easy to hide the costs of failure in a multitude of places within the budget. Ask yourself the question if the production line went down halfway through the processing cycle how much cost would be incurred in waste / lost production output.

2. Reduce Manual Handling



Injuries Associated with Food and Drink

In the food and drink industries, most musculoskeletal injuries arise from five main causes:

- Stacking / Unstacking containers (such as boxes, crates, modules and sacks)
- Pushing wheeled racks (such as oven racks and trolleys of produce)
- Cutting, boning, jointing, trussing and evisceration (such as meat and poultry)
- Packing products (such as cheese, confectionery and biscuits)
- Handling drinks containers (such as in delivery of casks, kegs and crates)

Additional Issues Of Manual Handling

Additional problems relating to poor / over manual handling that are potentially costing you money, include:

- Sickness absence
- High staff turnover
- Retraining,
- Product damage
- Loss of production

Food and Drink Manual Handling Regulations

Regulations require you to assess health and safety risks to your workers. The most relevant ones for moving food and drink are the:

- Management of Health and Safety at Work Regulations 1999
- Manual Handling Operations Regulations 1992
- Workplace (Health, Safety and Welfare) Regulations 1992
- Provision and Use of Work Equipment Regulations 1998

Approaches to Reduce Manual handling

Good management and consultation with all involved is the key to analysing the problems and implementing solutions. A few ideas to reducing manual handling are identified below:

- Prioritise your efforts by giving precedence to the manual handling issues affecting a larger number of employees rather than isolated complaints
- Consider a number of possible solutions. Food Processing Engineering Companies may be able to come up with a number of options so don't always take the first idea put forward. As well as looking at hardware options, also consider the importance of training and instruction,
- When considering workstation design and systems of work, don't forget the importance of the general work environment such as the condition and slip resistance of floors, workplace temperature, lighting, noise levels etc.

Food for Thought

Try solution ideas out on a small scale and modify them if necessary before you move on to full implementation. What works in one processing line or situation may need adapting a little for another – and, importantly, check your solution has not caused new risks.

For more information on how to reduce manual handling in your food production environment call Wrightfield on 01379 872800 and ask for a Technical Audit.



3. Maximise Premium Quality Meat



Manual poultry cone lines and automated deboning operations have the potential to deliver some of the best sales and profit margins in the industry, due to the volume of high-margin meat they produce. Unfortunately, many processing operations aren't realizing their full financial potential

Too often, too much meat yield is going to the Mechanically Deboned Meat (MDM) process to be sold as low-value product instead of being harvested and sold at premium prices. Depending on how well set up or trained the operatives large amounts of usable meat can be left on frames, and comparative performance between processing lines is inconsistent.

Impacts of a 1% Improvement

- Example based on recent market prices for breast meat and tenders vs. MDM (assuming full operating capacity)
- A 1.0% increase in typical deboning yields through remediation can enable approximately 350,000 lbs. of meat per year to the higher-value classification
- Dependent on market pricing this could result in approximately £400,000 additional product revenues per year

The need

- For accurate quality control capabilities to monitor yield performance
- To ensuring that you have the right production equipment and processes in place
- Consider new technologies that enable monitoring and analysis of the deboning process more accurately and in real time

4. Establish Processor Efficiency

A widespread measure of process capability used within food processing is Overall Equipment Effectiveness (OEE).

It is a composite measure for a specific machine or operational process derived as a multiple of:

% Availability x % Performance x % Quality =

A common characteristic of virtually all meat-processing plants is the hugely complex and complicated materials handling systems. These often involve:

- Double handling onto internal tray systems (with their own washing facility)
- High labour and equipment requirements
- Non-standard movement systems around the facilities.
- A large number of conveyors that perform the critical movement of product.
- Balancing line speeds to ensure all parts of the process work at optimum efficiency without bottlenecks elsewhere through the line

Conveyor Optimisation

- Factory layout and design of conveyors should be optimised to minimise space
- Not all conveyors are equal and the analogy of what you pay what you get holds true. Well designed and engineered conveyors will provide reliable operation, improve performance and help maintain hygiene standards
- When designed correctly as a part of an integrated system / process they become an intrinsic part of:
 - Movement of the product between operations
 - Synchronise operations between butchery, fixed weight sorting and retail packing.

Food for Thought

In many food processing plants limited attention has been given to layout and materials handling processes to achieve uninterrupted movement between value adding steps in the process. Layouts have often developed over the years as new products / processes are added into existing facilities and around existing infrastructure.

It also appears that extensive use of conveyors is unquestionably regarded as best practice in meat processing plants, however, many conveyors could be improved to have significant impact on improving process efficiency in meat plants.

Talk to Wrightfield and ask to speak with a conveyor expert.

5. Maximize Raw Material Utilisation

Raw materials are the fundamental element of the finished product. It is these ingredients that are usually the most expensive recurring cost. Because of this raw materials receive special detailed attention in terms of:

- Procurement - where even the smallest saving per unit can have a massive impact on high volumes production
- Transportation
- Storing
- Manufacturing

No matter what the product, each fundamental processing step incurs cost. To increase production efficiency it is crucial that the raw materials are handled minimally throughout the production process.

Methods for Maximizing Raw Material Utilisation Include:

- Data acquisition: The adage if it is not measured, it cannot be improved upon holds very true in material utilisation. The challenge is to ensure that you gain knowledge on which to base decisions and not just a mound of data.
 - Record key/ critical inputs throughout the process such as weight, volume or temperature of the raw materials as they are tracked throughout the manufacturing step.
- Utilise process flow diagrams to analyse process methods and identify those process points that are critical.
- Analyse and optimise process layout to:
 - Identify and prevent cross-flow or contamination.
 - Identify bottlenecks (or potential bottlenecks)
 - Minimise raw material handling or over-handling
 - Evaluate equipment required to meet production schedules
 - Ensure that line stoppages can be managed in a controlled fashion (e.g. through appropriate use of accumulators)

For more information on food processing improvements
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