

Saving money inside the plant

Global competition is tough - raw material prices are the same for almost all processors; sales prices are determined by an inflexible market; and margins are small. However, what can help on the road to success is to be more efficient than the competition.

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As soon as market conditions get tough, extra attention is given to the cost structure of an operation rather than possible production improvements. The first thought is often “Where can we cut costs?” However, this is not always the best approach. A closer look at the efficiency of the production process may deliver better and more sustainable results. This is particularly important since the actual production efficiency is often a long way from the optimum. Small changes in planning and on-time

production may lead to huge cost savings. The question is how to find and identify the issues involved?

It is often thought that an increase in line or cycle speed is the best way to improve efficiency. Unfortunately, this is misleading and may even result in a drop in efficiency. Increasing speed can only improve efficiency if all upstream and downstream processes can keep pace. Total insight into the whole process, including the optimum capacity of the systems used, is needed.

As an example, take a packaging line

that is designed for high capacity. The efficiency of the line will be significantly lowered if the production process is frequently interrupted for product changes, and the associated die set changes and cleaning procedures. In this case, the ‘effectiveness’ (ability to achieve pre-set goals) of the forming machine is low too; it does not match the production line’s potential effectiveness. A remedy is to redesign the packaging line to make it more flexible for frequent product changes by adding the possibility of fast die set changes.

OEE principles

Finding bottlenecks is not easy. Most processing companies struggle with optimising the efficiency of their production process. To help get a grip on factors like equipment effectiveness, labour efficiency, energy yield and raw material yield, vendors like CFS have developed software for identifying areas for improvement. CFS CostFox deals with measuring criteria, such as DIN and Overall Equipment Effectiveness (OEE) for all kinds of packaging machines.

Achieving the highest performance needs high overall equipment effectiveness. The OEE calculation tool has become a standard metric for production losses. It allows measuring the efficiency of labour, material and energy because they are intrinsically linked. For food producers, this calculation method needs to be integrated into dedicated programmes in order to achieve higher efficiencies. These programmes form the basis of Total Productive Maintenance (TPM).

Many meat processors embrace TPM to implement a “business driven” improvement programme. They strive to improve equipment effectiveness by reducing losses in the use of equipment, labour, material and energy. OEE is crucial to TPM since it reveals how efficient a production process is. It monitors the actual process with respect

to machine availability rate, performance rate and quality rate (Figure 1).

Measurement efficiency

Line operators can directly influence the way their machines run and can be challenged to beat performance expectations. However, an operator can only make improvements if the right information is received at the right time. Without access to real-time performance data, improvements are difficult to make. A real-time operator tool, like the CFS runOmeter, shows factual production figures and compares them with a set of key performance indicators (KPI). If the KPI goals are not met, the operator can start the main production efficiency programme. This programme displays all production process interruptions on the operator panel.

Production efficiency software helps operators understand and contribute to improvements. It empowers them to effectively respond to events that affect performance, and eliminate the original causes of efficiency problems. If the events are beyond the operator's control, the stored information can be forwarded to the person responsible.

These new calculation and control programmes are more effective in a management culture in which operators are empowered to make autonomous decisions and are encouraged to improve efficiency. They should feel that they are in control of the results for which they have accepted responsibility. Their awareness and interest in the total cost of production is crucial to optimise process efficiency. Cost transparency has become the key, which counts for the whole production process as well as the machinery used.

Most meat processors understand their own requirements, but are not always in a position to see the real economic consequences of fulfilling these requirements. With the assistance of various control units and an applicable life-cycle cost model, production efficiency software provides the means for objectively capturing and visualising these cost drivers. **MI**

Process efficiency software lets the machine talk and analyses the production losses where they occur

Permanent monitoring by the software shows the performance of machines on the operator panel and also makes them available for external PCs. It pictures production losses in percent and time relating to:

- Speed losses due to environmental factors or caused by the operators (auxiliary devices, programme changes, upstream/downstream equipment, loss of compressed air etc.)
- Machine preparation for production (die set change over; warm up, product change-overs etc.)
- Production on hold (no product available, line problems etc.)
- Machine alarms (sealing/forming problems, vacuum level, film heating etc.)
- Machine (operator) stoppages (safety stops, consumable material change-over etc.)

The data provides information which allows the operator to start immediate process improvements. Through making production costs transparent, marketing cost calculations will be simplified.



Figure 1 - The OEE principle



- Availability rate:** The percentage of time that the equipment can be used (e.g. 24/7/52) divided by the equipment running time.
- Performance rate:** The percentage of available time that the equipment is producing output at its theoretical speed for defined products. This includes minor stoppages and reduced speed loss.
- Quality rate:** The quantity of good output.