Poultry processing: developing new tools to be competitive

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Keywords: poultry; processing; mechanization; automation; control; development

Summary

Over the last years the industrialized processing of poultry only saw incremental changes in approach and technology, as opposed to more fundamental improvements or radical change. In general the overall performance of processing plants around the world has gradually crept up as the performance on equipment level is getting closer and closer to the theoretical maximum. At the same time the industry shows signs of maturation as the markets for poultry products are becoming more and more global, more transparent and therefore more competitive. This has resulted in a world wide ambition to run the processing lines faster, longer, and more efficiently, without sacrificing yield and quality. This led the focus of improvement to be moved from the component -a piece of processing equipment-, to the system level. The latter being the processing facility from wall to wall.

When looking at the developments in the various markets around the world, it is clear that the current trends could be summarized by two words; integration and control. Most companies have looked into these areas in some way or another and the expectation is that these issues will be on the agenda for a long time. One of the reasons being that changes in these areas impact on larger parts of the organization than just the processing line.

For processors, integration and control are the areas of interest as they might provide the competitive advantage that in some shape or form is required by all. This can be realized in the form of a competitive level of cost per unit, or by adequately managing the other key issues of this moment; food safety, product quality, labour & occupational health, yield, and animal welfare.

A limited number of suppliers, in combination with a transparent market could lead to the more or less general availability of equipment, systems and knowledge throughout the entire industry. Thus, processors worldwide have access to the same spread of technologies and support. In principle processing sites could well be equally effective and efficient. Reality off course is different and in terms of revenues this is clearly not the case. Regional, local and site specific characteristics make for different settings, challenging the management to find the most fitting situation specific solutions. As in all industries, some parties cope better than others. This observation clearly points to where a processors' competitive advantage lies best protected; in the way the organization is arranged and managed.

Industrial processing; classical development of mechanization

Over the last decades processing plants came to organize their primary process along more or less universal lines. This was driven by a variety of reasons, most of them related to the intrinsic nature of the process, the uniformity in product demand and the limited number of suppliers that cater to industrialized processors. All of the leading suppliers entered the market about 30-or more years ago and over time the entire process was mechanized from start to finish, literally from wall to wall. As this was done in a more or less uniform manner, one could say that above a certain line speed, all plants perform the same trick for at least a substantial part of the process. This stable environment allowed for the investment in continuous improvement of existing technologies and systems. Over time the successive leaps in mechanization were replaced by a series of smaller improvements, leading to an enhanced performance of existing functionalities. In a number of areas the equipment performance is nearing the theoretical maximum. Some examples:

Arrival; size of transport units tend to increase to contain more birds per unit. Loading and offloading times of trucks are minimized, at the same time improving the transport conditions on the trucks. Unloading of containers is mechanized, but hanging of birds to the shackle line is still manual. Gasstunning of birds can be done before or after unloading from the containers and before or after hanging the birds to the shackle line. Electrical stunning is only done after hanging the birds to the shackle line.

Killing & Defeathering: major part of the killing process is the cutting of arteries (of birds that can be dead from stunning) for proper bleeding. Before scalding defecation and cleaning the birds is advised to hygienically improve the scalding process. The outside of the bird is properly cleaned by removing the feathers, removing the heads and hocks/feets.

Evisceration: for removing the intestines and cleaning the remaining empty carcasses a number of different machines are available being vent cutter, opening machine, eviscerator, cropper, I/O washer and final inspection machine. After evisceration a veterinary inspection has to take place on carcasses and related intestines, after which the edible part of the intestines (heart, livers, gizzards) can be harvested.

Chilling/Maturation: for hygienic reasons, product temperature has to decrease to below 7°C within a reasonable time. At the same time the meat needs some time for maturation to become sufficient tender. This maturation time can be influenced by certain process conditions and/or by special processes (electro stimulation). Chilling can be done off line (such as immersion chilling in spin chillers) or on line (air, spray or evaporation chilling systems).

Cut-up: whole birds after the chilling can be cut into parts depending on the market needs and possibilities. A large variety of possible cuts resulting in a large variety of possible products can be made by a large variety of machines and systems. These machines and systems are available at different levels of pro

Deboning: some parts (breast, whole legs, thighs and/or drumsticks) can be deboned for fulfilling market needs for whole muscle meat. Other parts can be deboned by separators to gain remaining meat residues from carcass parts after deboning.

Order preparation: all products have to be collected and packed in forms requested by the market. Bulk packaging up to packaging individual parts on individual trays including labelling and pricing is possible to fulfil a specific customer order.

Warehousing and expediting: storage and/or transport of products under temperature controlled conditions.

One of the more recent phases in mechanization saw the connection of departments by re-hangers and its equivalent in order preparation and packaging. This created an opportunity to run the entire process at equal speed. Not surprisingly from thereon the trend to run the lines faster, longer and more efficiently without sacrificing yield and quality has only accelerated. With this increase in both volume and operating hours the vulnerability to downtime, logistical problems and quality deviations has gone up as well. The logistics of high speed processing are particularly challenging as the live birds as they arrive are a given, while markets or operational preferences can differ from one day to the other. All in all, the people in the plants are faced with increasingly complex equipment that usually runs at its maximum speed or above, in an environment that is vulnerable to interruptions. Realizing the required revenues from day to day presents a major challenge in terms of process management.

The next frontier; integration and control

The "process industry "type of characteristics (as opposed to discrete production) of the primary process is further enhanced by the fact that suppliers make an effort to minimize the number of people at the line and aim for continuous in-line processing. This in itself presents new challenges in terms of integration and control. The collection and integration of product or job specific data from lines that run continuously is both technically and operationally more complex. In general the realization of either managerial and/or legislative ambitions with regards to tracking and tracing requires serious attention and a close involvement of the management. Nonetheless, processors around the world do make the investment that they feel is required. Depending on one's perspective one could say that it is these investments that will eventually make the difference in terms of competitive power. The integration and control tools allow companies to manage the crucial issues of this time; costs, yield, meat quality, labour & occupational health, food safety, and animal welfare. In addition the systems can make the link between the commercial data (sales orders, gualities) and the shop floor (jobs, production orders, flock data etc). The flow of data can be huge and the classical need to have data presented as manageable information is as pressing as ever. One of the issues when designing -generic- systems of this nature is that different sites find different information relevant. This can be the case for reasons inherent to their existing administrative systems, legislative reference, company structure or degree of operational flexibility.

It is a small world

Less than a handful of suppliers around the world are capable of delivering innovative systems of a certain complexity for mid- to high speed processing lines. In addition, these suppliers all know their prospective customers and therefore competition is as serious between suppliers as between the processors themselves. This has its impact on the supplier's ability to carry out the costly innovations that are accepted, especially as the number of prospective buyers is even more limited. A product is considered successful if sales numbers are somewhere in the range of a couple of dozen systems per annum. As a result, the investment demanded from the processors who indeed consider running such a system, is substantial. It is fair to say that the economics of the new generation equipment and control systems take high line speeds and double shifts almost for granted. Operators that do not invest in these systems could, bit by bit, loose their ground in the efficiency battle. In today's market the less efficient plants could well end up being consolidated by others.

From the above it is evident that in order to make the numbers, both suppliers and processors require scale and indeed there is already a clear profitability gap between the ones that grow and others that do not. Continuation of this trend will lead to a situation where a very limited number of suppliers provide systems to a shrinking number of corporate conglomerates that are continuously growing in size and buying power. From this perspective one could say that the increased emphasis on integration and control as the major levers of performance improvement adds to the acceleration of the consolidation process.

Creating the competitive advantage

Arguably, the competitive advantage of processing plants does not exist in the choice of equipment, systems or processing technology itself. These are all general available from a limited number of sources, already supplying most of the industry. Within this "technology band width", processors do however make different choices when confronted with a variety of regional, local and site specific circumstances. As a result processing plants are operated in different ways, even within the same market space. At the same time, when asked about their competitive edge, processors univocally tend to name "quality" as the central notion for customer retention while "yield" and "cost control" are driving the returns. This seems to imply that out of the three classic competitive strategies; focus, differentiation, and cost leadership, the latter is combined with operational excellence as the predominant orientation towards the customer.

In light of the above the tendency to focus on integration and control has its relevance. The objective is to improve the consistency of the product quality while getting the most out of the live birds and the other resources. The fact that a lot of processors embrace a comparable model requires a shift of attention towards the qualities that are required to compete effectively. At the heart of the matter lies the assumption that the tools that are to facilitate integration and control will only yield their returns when they are properly linked to the business processes by means of an adequate data model. In other words; an organizations' perspective on management and control first has to be defined and translated into information requirements, work flows, procedures and the like, before any tool will generate the desired leverage. This clearly identifies organizational development as an area that is increasingly relevant to the realization of a sustainable competitive advantage.