Maximising protein's profitability from meat and poultry

There is money in protein. Whether it is meat or poultry, and whether it is processed for human consumption or rendered for pet food, it is worth making the effort to extract every possible kilogram of saleable raw materials. But this is a business with risks.

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For one thing, derived meat for rendering delivered by slaughter-houses typically contains foreign materials, and these can be so difficult to detect that they get all the way down the processing line into the final product. For another, when rendered meat and poultry are turned into dry pet food, one type of kibble can easily get cross-contaminated with another, so that packages mistakenly contain unlisted ingredients. And if potentially harmful products get into the hands of an unhappy customer with a cellphone and social media access, the retailer's brand reputation can quickly be damaged.

These threats mean it is crucial for processors and renderers to have effective safeguards in place to protect food safety and product quality, whilst also minimising food waste to improve sustainability and profitability. These things have always mattered, of course, but shifting consumer expectations make them more important now than ever before.

Risks, yes – but potentially big rewards

The risks and rewards of meat processing and rendering are increasing for two big reasons. One is that consumers have become far less tolerant of imperfections in the food they buy for themselves or their pets. The other is that the demand for high-quality, protein-rich foods for people and pets is growing fast.

In fact, mankind's need for proteins is set to skyrocket. The United Nations' Food and Agriculture Division predicts that by 2050 global meat production will double – yes, double – as the world's population increases from 7.9 billion people to 9.8 billion. At the same time, increasing wealth in developing nations will empower greater numbers of people to spend more on food.

Demand for pet food is also booming. Market researchers forecast that this market's global value will increase in the next seven years at a compound annual growth rate of almost 5%, from $94bn in 2020 to $137bn in 2028. What is more, this market is being reshaped by the 'humanisation' of products that contain fresh ingredients,

superfoods, and high protein – and premium products can command premium prices.

Increasing meat production is good news for processors and renderers, but there is a downside: meat and dairy production are responsible for a whopping 14% of global greenhouse gas emissions. This means it is imperative to minimise food waste – not only by getting retailers and consumers into the habit of throwing away less, but also by making more efficient use of the potentially usable food in livestock.

For these reasons, rendering is an environmentally-friendly way to recycle material that would otherwise be wasted – and it also reduces the greenhouse gas emissions that would come from the natural decomposition of animal parts in compost or landfill.

The National Renderers Association in the USA calculates that rendering animal tissues rather than leaving them to decompose has the same effect on greenhouse gas emissions as removing 12.2 million cars from the road.

Sorting machines solve the problems

Thanks to technical advances, there are solutions to all of these challenges. Tomra Food, the leading manufacturer of sensor-based sorters for the food industry, offers machines that safeguard brand reputations and enhance sustainability by reducing food waste, protecting food safety, and consistently maintaining high product standards.

Modern optical sorting machines also solve the widespread problem of labour scarcity, as well as helping to eliminate the health risks inherent on processing lines – as the Covid-19 pandemic drags on – when people have to spend a long time standing close to each other. And whereas manual sorting is subjective, imperfect, and especially vulnerable to errors when labourers are tired or bored, automated sorters work from the beginning to the end of each shift with unflagging accuracy.

Tomra's sorters detect and eject unwanted materials from processing lines that simply cannot be seen by the human eye or inferior machines. They do this by inspecting materials according to their shape, colour, structure, size, and even their biological characteristics. Tomra also offers machines with x-ray technology to detect the presence in food of high-density foreign materials.

For additional advantages, Tomra's machines can be connected to Tomra Insight, a web-based data platform that gathers sorting data in real-time and stores this securely in the cloud. Live data can be reacted to immediately (and remotely) to optimise machine settings; historical data can be used to quantify and compare the quality of materials from suppliers. Such data analysis will become increasingly valuable as

we move into a digitised future, transforming sorting from an operational process into a strategic management tool.

So, let us take a brief look at the sorting machines best-suited to meat and poultry processors, rendering plants, and pet food processors.

Solutions for meat and poultry

Tomra offers sorting solutions for a wide variety of meat and poultry applications. These are for frozen products such as ground meat, nuggets, patties, and bacon bits, and for fresh raw products such as sausages.

Tomra also offers inline inspection systems. These help processors determine the right fat percentage for any grinder/mixer set-up for minced meat, burgers, and sausages, as well as making real-time measurements of protein and moisture levels. And the QV-P in-line detection machine for chicken fillets helps ensure that fillets with 'wooden breast' do not end up in the final packaging.

Producing and selling tasty, protein-rich sausages should not be compromised by having casing residues still attached to the final product (or by any other foreign material, for that matter). The Tomra 5B safeguards producers and brands against complaints and expensive recalls by detecting even the smallest casing fragments. The Tomra 5B also controls sausage length, dimensions, discolouration, and breakages. And there is the option to sort out the rejects in two streams – one for foreign materials and casing remains, and one for products that do not match the set scope but can be reused, minimising food waste.

For IQF products such as chicken nuggets or stripes, bacon bits, or other breaded or unbreaded products, the best sorters are the Tomra 5C. Located after the freezer and close to packaging, this unit sets the benchmark in product safety at the same time as minimising false rejects and food waste. By using new, best-in-class laser technology combined with Tomra's unique BSI+ (biometric signature identification) scanner, the unseen becomes visible, making foreign materials a problem of the past. These technologies are also highly effective at sorting-out discolouration, black spots, embedded plastic, doubles, thin coating, and voids.

Sorters for pet food and rendering

Producing food for pets is strictly regulated by local and global legislation which is designed to ensure product quality and food safety.

Complying with these regulations requires the use of safe ingredients and additives, hygienic processing practices, and HACCP (hazard analysis and critical control points) management – but even so, there is still the risk of foreign materials entering the manufacturing facility in raw materials.

This is why Tomra works closely not only with pet food manufacturers, but also with their suppliers in the rendering industry.

Important protein sources in both wet and dry pet food are animal-derived ingredients. However, entering the rendering facilities these ingredients often contain various foreign bodies which come from the abattoirs, such as rubber parts, foils, wood, glass, and metals. This is hard to avoid with an automated production line, but also mostly hard to detect with conventional methods such as metal detection and/or x-ray.

The Tomra 5C solves this, preventing foreign materials from reaching the pet food manufacturer. This sorter often acts as the final control on the meal line: placed after the final screen, it not only detects and rejects even the smallest particle of foreign material but also sources out all the good product coming from the screen, feeding this into the good stream again.

These capabilities, plus the ability to regulate the ash content to enhance the final quality, make the Tomra 5C essential for every meal stream.

In dry pet food, foreign material is not the only threat – there is also the problem of cross-contamination. As a solution, the Tomra Nimbus is unbeatable. This machine's various sensors protect against foreign materials, loose and embedded, and cross-contamination – and with Tomra's new pet food software, the change over from one recipe to the next is like a snap of the fingers.

This eliminates traditional ways of trying to avoid cross-contamination which are both time-consuming and product-consuming.

Tomra's unique BSI+ technology checks the inside of materials, ensuring that different types of kibble do not get mixed even if they are near-identical in outward appearance, and by using the new petfood software, the operator always has the best view on what to produce next.

For producing best-in-class pet treats and snacks, foreign materials must be prevented from ending up in the final package, and products should have the same size, form and colour. For this the Tomra 5B is the perfect solution, ensuring that only the right products get into the package. In wet pet food, the Tomra 5B is ideal for the inbound set-up, where incoming frozen blocks pass through either a breaker or a grinder before entering the mixer. Placed between the breaker/grinder and mixer, the Tomra 5B effectively detects and sorts various foreign materials including stones, hard and soft plastics, metal, wood, glass, rubber and bones.

In addition to protecting final products from unwanted materials, the Tomra 5B also logs every batch, so it is possible to assess what is coming from suppliers accurately.

An investment that pays back well

When processors and renderers first adopt Tomra's sorting solutions, they are pleased to find that the once-steady trickle of customer complaints dries up. One good example of this is JG Pears, a leading processor of animal by-products and food waste in the UK, producing a range of meals and fat for the pet food industry.

The company's Site Manager, Craig Harrison, said: "Non-conformances with our customers have reduced dramatically, and we see very, very little waste or foreign bodies in our material. Our current customers have seen the difference in the finished product and there is lots of interest from additional customers enquiring about buying our material."

In addition to keeping customers happy, then, Tomra's sorting machines are also a key which can unlock new business. One of many business leaders who will affirm this is Andy Kettle, Managing Director of GA Pet Food Partners, Europe's leading manufacturer of private label premium dry pet food.

Andy commented: "Tomra's technology has helped us break open new markets which previously would not have been available to us. For me, it has been one of the best investments made by the business in the last three to four years." ■