

High-speed sorting technology recovers 25-35% more product compared to manual inspection

Poultry processors plan to recover millions of dollars in lost revenue by turning to advanced, high-speed sorting technology that recovers 25-35% more whole chicken nuggets currently sold as low value trim.

Jeff Elliott

Chicken nuggets are among the most popular foods in the world. Globally, tens of billions of nuggets are sold by McDonald's every year. In the U.S., frozen chicken nugget sales alone reached \$1.1 billion by mid-2023, an 18% increase over the previous year. Within this rise is another emerging trend — a growing demand for “prime” whole chicken breast nuggets, as opposed to formed products.

However, the demand for premium nuggets highlights a significant issue within the poultry processing industry, specifically the widespread practice of using a large workforce to manually inspect and separate portioned chicken breast for nuggets from lower value “trim.” This is a costly and inconsistent process that can result in 25% to 35% loss of high-value nuggets.

For high-volume processors, this can equate to millions of dollars of lost revenue annually. In addition, poultry processors face challenges due to the workforce demands, including high turnover, absenteeism, subjectivity in sorting, and rising costs.

Given the potential losses coupled with increasing demand, poultry processors are turning to high-speed, automated sorting systems that singulate, or separate, each piece of chicken so it can be scanned by advanced proprietary vision systems. Nuggets that meet the processor's specifications for size and shape are then sorted into bins or totes.



There is a growing demand for “prime” whole chicken breast nuggets, as opposed to formed products.

The process, which is now enhanced by faster and more accurate AI identification of “prime” nuggets, can sort at speeds of 4,200 pounds per hour and recover most of the lost high-value nuggets currently lost to trim.

Inefficiency in manual sorting

To create a nugget, poultry processors use portioning equipment to cut chicken breast into strips, cutlets, or nuggets of specific size, weight, and shape. Plant workers then visually inspect and manually sort the nuggets, or remaining trim from breaking down the chicken, as the pieces move on a conveyor. The nuggets are evaluated and sorted and those that make the grade are separated into bins or totes. The remaining trim is sold at a much lower price per pound — roughly half — as a protein or for use in other processed foods.

“The current process involves people inspecting a ‘sea’ of nuggets. They are asked to assess the size and shape, which is nearly impossible given that the nuggets are pressed up against each other, while also looking for any blood spots or excess fat,” says James Lapeyre, general manager of Laitram Machinery, a global leader in food processing solutions such as steam cookers, blanchers, pasteurizers, roasters and vision graders for nuts, seafood, and vegetables. The company is one of the four operating divisions of Laitram LLC, along with the Intralox, the global leader in modular plastic conveyors used throughout food processing and other industries.



According to Lapeyre, consistent and objective assessment of nuggets can be hindered by personal bias, subjectivity, fatigue, and even boredom. Moreover, poultry processors experience very high employee turnover and absenteeism rates. By reducing labor requirements, a company can eliminate persistent

“Trim” that remains is sold at a much lower price per pound – roughly half – as a protein or for use in other processed foods.

employee turnover and the costs related to training and onboarding new staff.

Considering the challenges, automating the inspection and sorting of nuggets from trim appears logical. However, there are currently few systems developed for this purpose.

With 75 years of experience in shrimp processing and grading equipment, Laitram Machinery identified similarities in the technological requirements, specifically the need to separate and scan each item at high speed. Intrigued by the possibilities, Laitram’s R&D team initiated a project to create a high-speed nugget sorting system several years ago.



A fully automated sorter separates the nuggets, using high-precision laser imaging and computer vision algorithms to inspect and sort each piece to the processor’s specifications.

The result is the SMART Sorter, a patented, fully automated sorter that separates the nuggets and then utilizes high-precision laser imaging and computer vision algorithms to inspect and sort each piece to the processor’s size, shape, and weight specifications.

“We developed a method of singulation at very high speeds that enables us to visually inspect each nugget. By doing that, we get a near-perfect understanding of its size and shape and can recover more prime nuggets,” said Lapeyre.

The system was introduced by Laitram at IPPE (International Production & Processing Expo) in Atlanta, Georgia, and was recognized as the best innovation in 2024. Today, the system is already installed in the facilities of some of the world’s largest poultry processors.

The ROI comes from the immediate increase in prime nuggets upgraded from trim. The system can identify 20-40% more nuggets that originally were not being identified in manual sorting. Considering that premium nuggets garner roughly twice the price per pound of trim and that volumes can run into millions of pounds annually, the savings are significant.



The SMART Sorter's ROI comes from 20-40% more prime nuggets that originally were not identified in manual sorting.

and defect detection, minimizing the risk of “out-of-spec” nuggets reaching customers and further boosting recovery rates.

Lapeyre explains that AI can identify patterns without additional programming. “Over time, the system continues to learn the attributes of a ‘good’ nugget and visually recognize one. We can also train the system to recognize when there is a clump (two or three potentially good nuggets touching) and how to handle that. In the past, that might have ended up as trim.”



The SMART Sorter significantly enhances nugget quality, achieving 99% accuracy within specified weight and shape parameters.

As for labor, the SMART Sorter decreases labor requirements and costs by more than 50% compared to manual processing and sorting. “Now workers only need to look for blood spots or excess fat, a much simpler task,” explains Lapeyre.

Laitram Machinery recently integrated Artificial Intelligence (AI) to almost double throughput rates to 6,500-7,000 pounds of nuggets per hour. AI also enhances clump

The SMART Sorter also significantly enhances nugget quality, achieving 99% accuracy within specified weight and shape parameters. This precision is crucial, as the retail, foodservice, and Quick-Service Restaurant (QSR) sectors frequently require nuggets in diverse sizes and weights. Additionally, chicken strips, also crafted from whole chicken breast, are highly popular and often required in specific dimensions.

The SMART Sorter offers innovative digital reporting features (source-by-source, batch-by-batch, and nugget-by-nugget) to allow plants to further optimize the process. The system was designed with food safety and sanitation requirements in mind.

For processors that want to test product on the SMART Sorter, Laitram has a fully functioning system at its testing facility in New Orleans, Louisiana.

“We believe this technology will become the obvious and only method for producing consistently high-quality nuggets. It will increase the supply of prime nuggets by a significant amount and do it at the price of trim,” says Lapeyre.

For more information: call +1 (504) 570-5299; email lm.sales@laitram.com; or visit laitrammachinery.com.

Source URL: <https://www.processingmagazine.com/process-control-automation/article/55240178/high-speed-sorting-technology-recovers-25-35-more-product-compared-to-manual-inspection>