



Whitefish Case Study



New & Innovative Solution for the Filleting and Processing of Small Whitefish

Our new solution is set to transform the whitefish processing industry, as it makes it profitable to process small whitefish (from 300 to 900 grams). The solution, which has high throughput rates and a minimal labour requirement, produces skinless and boneless whitefish fillets of exceptional quality for human consumption.



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Introduction

Fish processors in the UK and Ireland are under pressure from multiple sources, from labour shortages to changing consumer habits to quotas and other regulations that govern fishing and fish processing. Transport costs have soared, a number of fish species are under pressure, and it is becoming increasingly difficult to source fish from outside the UK or Ireland.

There is also a continual push to identify profitable new product areas to drive growth, while improving productivity on existing fish processing lines. Labour and skills requirements must be reduced to address labour shortages, plus it is essential to continuously work to improve sustainability, throughput, and yield.

At SF Engineering, we invest annually in research and development to bring innovative solutions to our specialist sectors, including fish processing. This whitepaper describes the results of recent R&D work that has created a **unique opportunity** for fish processing companies that will deliver a **rapid return on investment** and significantly **enhance profits** while addressing all the key challenges and priority areas highlighted above.

The opportunity presented in this whitepaper is specifically aimed at whitefish processors. It is focused on a new, innovative, viable, highly profitable, labour efficient, and sustainable solution for the **filleting and processing of small whitefish**.

Profitable Filleting & Processing Solutions for Small Whitefish



The Small Whitefish Processing Challenge

Small whitefish are generally not processed for human consumption in the UK or Ireland, as the process is too labour intensive to be profitable. With the tight margins that exist in the industry, it is just not viable to process small whitefish when there are other options available. As a result, whitefish processors understandably favour bigger fish.



This has knock-on effects throughout the entire sector. Small whitefish are caught, often as bycatch, but it is believed that up to 50 percent are discarded as there is a limited market for landed whitefish in the UK or Ireland. Currently, the small whitefish that are landed are mostly sent to produce fishmeal.

The fact that so much small whitefish catch is discarded is a sustainability issue for the fishing sector as a whole, and it has potential repercussions in areas like fish quota regulations.

For whitefish processors, the focus must remain on profitable operations, with investments focused on making new and existing lines more sustainable, productive, and profitable.

A Viable and Profitable Small Whitefish Filleting & Processing Solution

SF Engineering, in conjunction with our partners, has developed a small whitefish processing solution that requires **minimal labour** and produces a high-quality whitefish product with **maximum throughput and yield**.

This is the **biggest new opportunity** for whitefish processors in many years as our solution now makes it **financially viable** to introduce small whitefish processing in your facility.

Plus, as this is a **unique solution**, you also have an opportunity to introduce a product line that your competitors don't have, giving you a further **commercial edge**.

Let's Run the Numbers

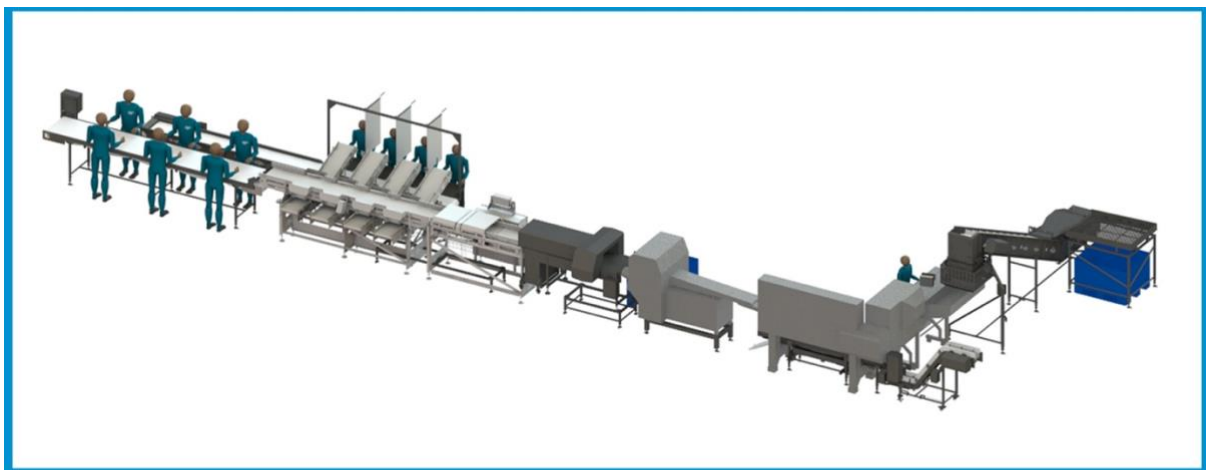
Landed small whitefish are low-cost to purchase, but a traditional, manual processing line would need 40-50 people to achieve a viable level of produced product. Many of those operators would also need high levels of skill to fillet the fish.

Our innovative new solution transforms the economics of small whitefish filleting and processing. Here are some of the key facts and figures.

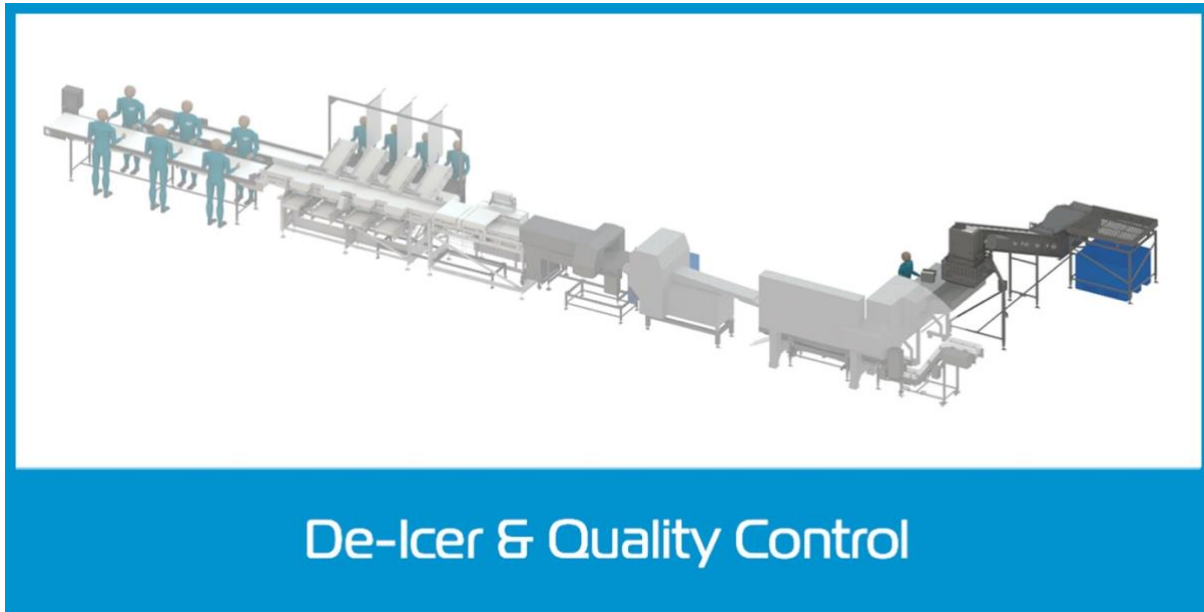
- 120 fish per minute processing capacity
- Produces 240 fillets per minute on a line that requires only six operators
- The solution is suitable for small whitefish between 300 and 900 grams
- Small whitefish can be purchased at a fraction of the cost of gutted 1-2kg whitefish
- The low purchase cost for small whitefish combined with minimised processing costs deliver excellent margins
- The product produced by our solution is high-quality with multiple retail and secondary processing market options available

The following section will explain in more detail how our new solution would work in your facility.

The Innovative and Profitable Filleting Solution for Small Whitefish

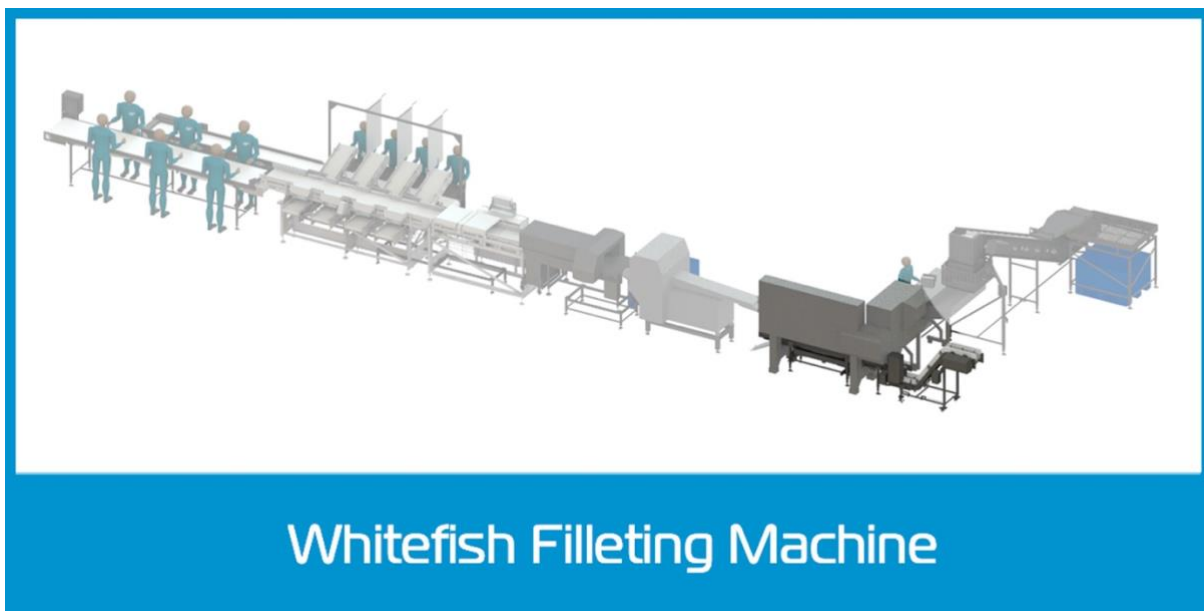


De-Icer and Quality Control



The production line starts with whole small whitefish going into a hopper for de-icing and quality control. The product then progresses along an SF Engineering-designed and built elevator conveyor.

Whitefish Filleting Machine



The fish fed into the filleting machine in a process that requires two operators. The filleting machine is specially design for filleting small whitefish – fish that are between 27 and 52 cm and between 300 and 900 grams. This machine is manufactured by one of the world's leading food processing equipment manufacturers and requires just two people to operate.

Cod, haddock, whiting, and small hake can all be processed through this machine. The operators use switches to adjust the machine according to the type of fish being processed.

Almost all small whitefish catch is landed as full fish that haven't been gutted. Our solution addresses this as it handles both heading and gutting. Plus, only one process is required to complete these two essential stages. The protruding tail end of the fish is also cut away. All the cuts are electronically controlled fish-by-fish, ensuring precise cuts with maximum yield.



J-cuts are also possible with this machine. In fact, this is the only machine on the market that produces a J-cut for pin boneless fillets as well as standard fillets.

The speed of the machine enables high throughput rates of up to 120 fish per minute.

Summary of the Process to this Point

- Filleting machine that guts small whitefish and removes the head and tail in one operation
- 120 fish per minute producing 240 fillets per minute
- Electronically controlled cuts to maximise yield
- Pin boneless and standard fillets
- 2-person operation
- Minimal footprint
- Low power output and water consumption



Solution Continued

Skinning

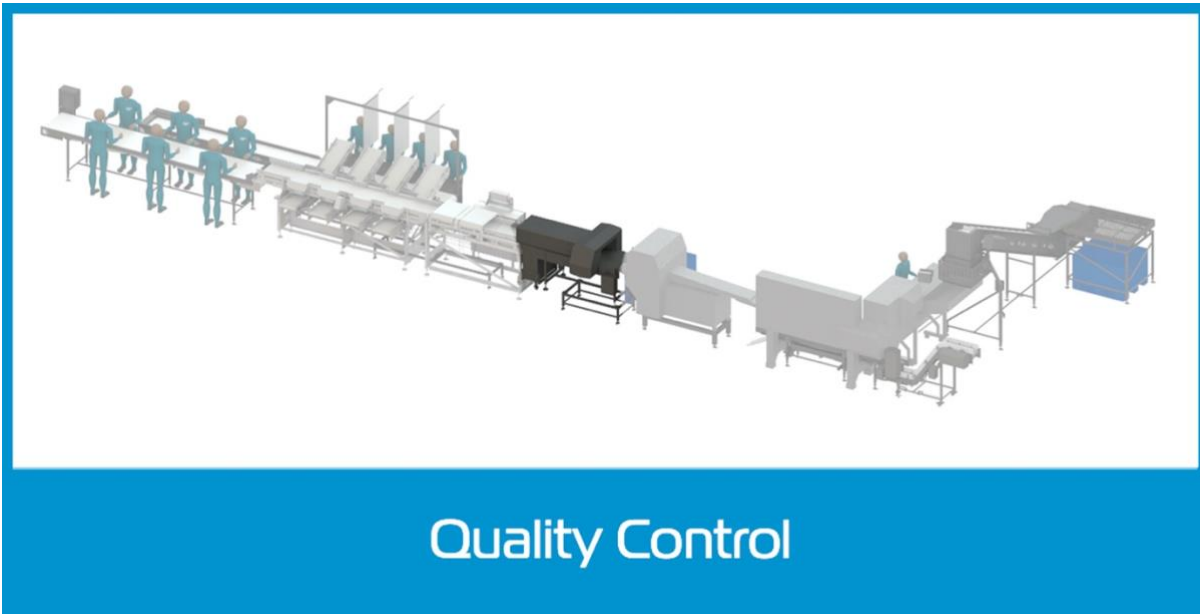


Following the gutting and heading operation, the small whitefish fillets are transferred automatically to a skinning machine. The skinning machine is high capacity and has a high throughput rate, so is capable of processing 240 fillets per minute.

It operates via a cold drum, where the skin on the fillet freezes onto the drum. This highly effective process doesn't put any strain on the fish meat and maximises yield. The machine is from a leading brand in the industry and was designed with hygiene and safety in mind.

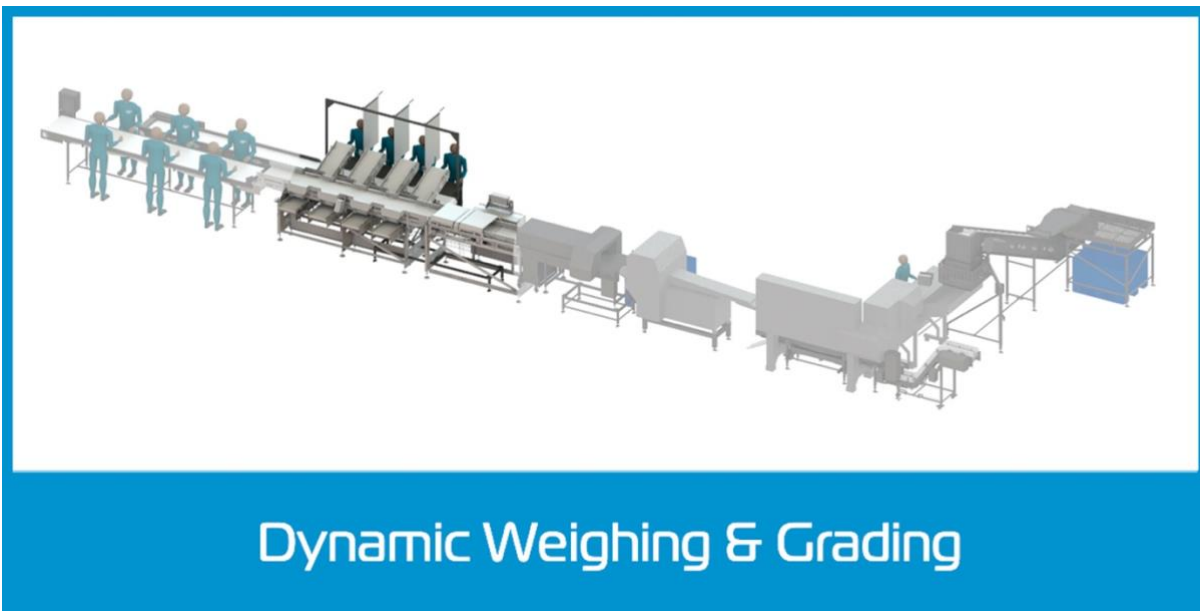
The operation of the line to this point can produce 240 high-quality skinless and boneless whitefish fillets per minute with minimal operator intervention.

Quality Control



The skinless and boneless fillets are now transferred to the quality control processes that you require on the line. We can integrate an X-ray or metal detector machine, with equipment from leading brands like Ceia and Ishida. We'll also make sure the throughput of the line is maintained by using a retracting belt conveyor to feed into the X-ray or metal detector.

Dynamic Weighing



The quality checked skinless and boneless fillets then move onto the dynamic weighing and batching section of the line. Our solution splits this into two lanes to maintain the 240 fillets

per minute throughput rate, but we can customise the line according to your requirements, including the footprint available in your facility.

We use state-of-the-art batching and grading technology to accurately weigh the fillets. There are multiple configurations we can offer on this part of the line, including an intelligent option that automatically puts the fillets into four different weight grades. The batched and graded fillets are then transferred to a packing area.

Other Key Features of Our Small Whitefish Filleting Solution



Other Key Features

- Minimal footprint
- Reduced labour requirement
- Cleaning assist
- Sustainable
- High-quality belts
- Optimised chassis design

Footprint

- Footprint substantially smaller than what would be required on a manual whitefish filleting line
- Expert design from the experienced SF Engineering team to meet the requirements of your facility

Labour Requirement

- A manual whitefish filleting line would require over 40 people to achieve a throughput of 240 fillets per minute. Our solution reduces this labour requirement by up to 88 percent.
- The labour that is required also needs lower skills levels, as the filleting process is completed by specialist equipment.

Cleaning Assist

- All SF Engineering fish processing lines have cleaning assist technologies and innovations built-in as standard
- This includes a tubular and open construction, belt lifters on conveyors, standoffs on all components, and other design features that make cleaning processes easier and more efficient

Sustainability

- A significant number of small whitefish are currently discarded before fishing boats return to shore. Anything that is landed is sent for fishmeal production. Our process means this common fish catch can now be profitably processed for human consumption in the form of a high-quality product.
- All our solutions are manufactured with sustainability considerations in mind. For example, we will design your small whitefish filleting line to minimise the use of water.

High-Quality Belts

- We use high-quality belts from brands like Volta on all our conveyors
- These belts minimise slippage, are easier to clean, and have a reduced cost of ownership

Optimised Chassis Design

- Our conveyors have minimal fixings, with an average of 66 percent fewer nuts and bolts compared to standard production line solutions
 - The open chassis design of our solution reduces contamination risks and improves cleaning processes
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Benefits Summary

- Solution designed specifically for small whitefish that are 300 to 900 grams
- Processes 120 fish per minute, producing 240 boneless and skinless fillets per minute
- Easily switch between fish species
- Heading, tail removal, and gutting are all completed in a single process with no operator intervention
- High and consistent yield due to electronically controlled cuts and effective skinning process
- Produces pin boneless and standard fillets
- Full quality control and dynamic weighing with minimal operator intervention
- Full production line can be run with as few as six operators
- Solution optimised for cleaning, hygiene, and safety
- Turns a fish resource traditionally used for fishmeal into a high-quality product for human consumption, delivering significant sustainability benefits

Conclusion

Until now, the economics of processing small whitefish in the UK or Ireland didn't add up. It simply wasn't possible to produce a high-quality product using manual filleting and processing in a way that was profitable. It was also difficult work for operators, with the filleting process requiring a high level of skill.

The solution we have developed at SF Engineering is set to transform small whitefish processing in the UK, offering a new and profitable product for fish processing companies to add to their lines, while also contributing to the sustainability of the fishing and fish processing sector.

To find out more about our small whitefish filleting and processing production line solution, please get in touch with a member of our team today.

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