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INTERCOOL FOOD TECHNOLOGY LTD.

Carcass Chilling Survey and Impacts on Meat Quality

Efficient chilling of freshly slaughtered carcasses is a vital process in the production of pork meat. The rate at which carcasses are chilled, directly influences the operational efficiency and plays a critical role in determining meat quality, chilling loos, shelf life, and microbial safety.



Typically, carcasses enter the chilling process at a temperature of approximately 39 to 40°C. The industry standard is to reduce this temperature to a cutting temperature of around 5°C within 20 to 24 hours post-slaughter.

As the meat industry continuous to evolve – with increasing production volumes and heavier carcass weight – traditional chilling systems are becoming outdated and insufficient. These legacy processes often fail to meet modern standards for both meat quality and chilling performance.

We offer a comprehensive consultancy service that integrates advanced chilling technologies with meat quality optimization. Our approach ensures that your chilling processes are aligned with current industry demands, delivering measurable improvements in product quality and operational efficiency.

Chill Loss • Drip Loss • PSE • Color • Shelf Life • Safety • Cuttability • Energy Consumption

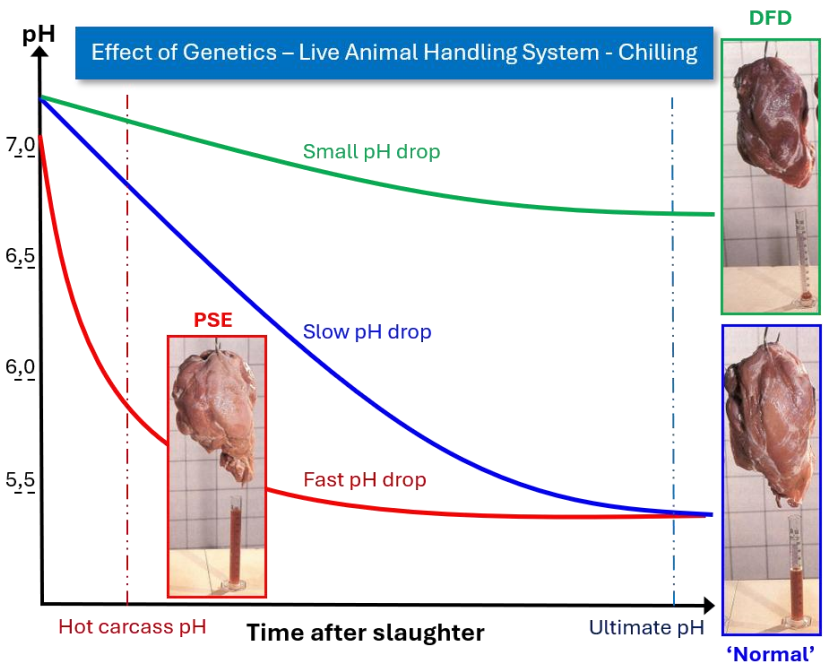
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Maximize Yield, Quality, and Profitability Through Optimized Carcass Chilling



An efficient carcass chilling process delivers substantial economic benefits by minimizing moisture loss and enhancing overall meat quality. The advantages are particularly evident in meat color, where improved chilling produces a darker, more appealing appearance while reducing the occurrence of PSE (Pale, Soft, Exudative) meat in both ham and loin cuts. These improvements directly enhance product quality and reduce drip loss, two critical factors influencing customer satisfaction and market value. By reducing chill loss from 2% to 1%, processors can achieve annual cost savings exceeding €1.3 million per one million carcasses. In addition, improved meat color can increase product value by up to one full point on the Japanese Color Scale, generating a premium of more than €0.50 per kilogram in high-value markets.
Optimizing your chilling process is therefore not only a quality improvement initiative but also a strategic opportunity to unlock significant financial gains across your entire production operation.





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Optimizing the Chilling Process for Superior Meat Quality

The chilling process is a critical factor in determining final meat quality. In Quick Chill Tunnels (QCT), process air temperatures can be reduced to below −20°C, enabling rapid surface cooling of the carcass. Conventional batch chilling systems, by comparison, typically operate at temperatures above 0°C throughout the chilling cycle. While both methods primarily use air as the cooling medium, some facilities enhance performance through spray chilling, where chilled water is intermittently applied to carcasses to improve heat removal and reduce weight loss.

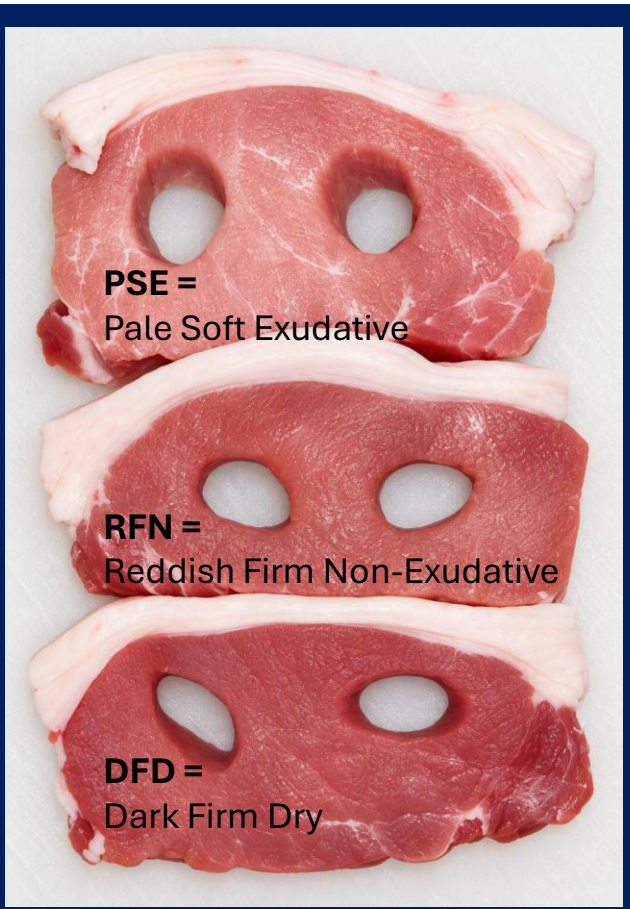
The most effective chilling strategy combines rapid chilling with subsequent temperature equalization. During the initial QCT phase, warm carcasses are exposed to intense cooling, causing the surface temperature to fall below freezing and creating a thin protective crust. At the same time, the internal muscle temperature decreases more gradually, preserving product integrity while accelerating the chilling process.

Following rapid chilling, carcasses are transferred to an equalization (EQ) chill room maintained at 0–4°C. Over the next 16–20 hours, temperature differentials within the carcass are gradually balanced, resulting in a uniform final temperature of approximately 4–5°C. This two-stage process delivers outstanding chilling efficiency while supporting superior meat quality, minimizing quality defects, reducing weight loss, and maximizing product value.

Key Benefits

- Faster heat removal and improved process efficiency
- Enhanced meat quality and consistency
- Reduced risk of chilling-related defects
- Optimized yield and minimized weight loss
- Higher product value and extended shelf life





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Our Approach to Enhancing Carcass Chilling Performance

At Intercool, we take a holistic approach to carcass chilling optimization, combining engineering expertise, process analysis, and industry best practices. Our goal is to deliver consistent chilling performance, improved meat quality, higher yields, and sustainable operational efficiency. Each project follows a proven, results-oriented methodology encompassing the following key stages:

1. INITIAL ASSESSMENT

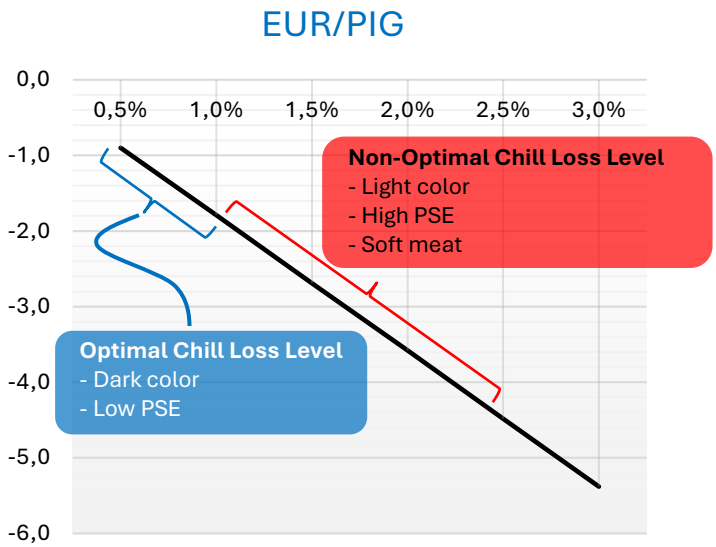
Meat quality challenges are rarely caused by chilling alone. Our assessment begins with a comprehensive review of the entire production process, including animal handling, slaughter practices, and chilling operations. This integrated approach enables us to identify all factors that may impact product quality and performance.

2. SURVEY OBJECTIVES

The purpose of the survey is to determine the underlying causes of your specific meat quality issues. Based on our findings, we provide a clear, practical action plan with targeted recommendations. This gives your team the insight and direction needed to implement effective improvements and achieve measurable results.

3. SURVEY REPORTING & IMPLEMENTATION SUPPORT

All observations and findings are compiled into a detailed technical report, including data analysis, photographic documentation, expert evaluations, and recommendations. The report serves as a roadmap for continuous improvement and operational excellence.



Where required, **INTERCOOL** FOOD TECHNOLOGY provides hands-on support during implementation, ensuring that recommended actions are translated into sustainable improvements.

Delivering Long-Term Results

Through this structured and evidence-based approach, we help optimize carcass chilling performance, improve meat quality consistency, reduce losses, and strengthen your ability to maintain high production standards over the long term.

FOOD INDUSTRY EXPERIENCE

Solutions for red meat, poultry, fish and other food products, developed together with trusted specialist suppliers worldwide. Our focus is the right combination of design, process technology and material selection to improve performance, simplify execution and control investment and operating costs.

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Your Solution Facilitator!

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