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How to improve the fresh food supply chain efficiency of small wholesale distributors

Analysis of Small Asian Food Wholesalers in Finland

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Abstract

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This thesis investigates how small Asian food wholesalers in Finland can improve the efficiency of their fresh food supply chains. Despite the rapid growth of Finland's multicultural food market, small Asian distributors face persistent challenges such as high logistics costs, strict cold chain requirements, and limited forecasting capabilities. The study aims to identify key operational bottlenecks and propose strategies for enhancing supply chain performance. A qualitative research method was applied through semi-structured interviews with a representative Helsinki-based distributor. The findings reveal that efficiency is hindered mainly by seasonal price fluctuations, inadequate cold chain coordination, and limited digitalization. However, strengths such as multilingual supplier communication, niche product specialization, and flexible organizational structures offer competitive advantages. The study suggests that integrating data-driven demand forecasting, collaborative cold chain management, and hybrid JIT inventory practices could significantly enhance efficiency and sustainability. The research contributes to the understanding of how small ethnic distributors can adapt to Finland's highly concentrated retail market through strategic supply chain innovation.

Keywords: Supply Chain Management, Cold Chain Logistics, Small Distributors, Asian Food, Finland, Fresh Food Supply

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Contents

Glossary

CCL	Cold Chain Logistics
ECR	Efficient Consumer Response
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
FAO	Food and Agriculture Organization
FIFO	First-In First-Out
IoT	Internet of Things
JIT	Just-in-Time
LIFO	Last-In First-Out
PFSCs	Perishable Food Supply Chains
QM	Quality Management
RFID	Radio Frequency Identification
SCM	Supply Chain Management
SDG 12	The Sustainable Development Goal 12
SKU	Stock-keeping Unit
SMEs	Small and Medium-size Enterprises
UNEP	United Nations Environment Programme

1 Introduction

The globalization of food markets and growing multicultural consumption patterns have reshaped Finland's food distribution landscape. Asian food products, once considered niche, are now integral to Finnish retail and restaurant sectors. However, small Asian wholesalers, who serve as the bridge between Asian producers and Finnish consumers, encounter significant challenges in managing the fresh food supply chain. These challenges include maintaining temperature control during long-distance transport, responding to seasonal fluctuations, and competing in a market dominated by a few large retail conglomerates (Irz & Liu, 2016: 1–2).

Efficient fresh food supply chains are essential for ensuring product quality, minimizing waste, and enhancing competitiveness. A food supply chain that runs "from farm to fork" needs good coordination among producers, processors, and retailers to ensure smooth operations and consistent quality (Bourlakis and Weightman, 2004: v-vi). Research on cold chain logistics also shows that proper temperature control and the use of data analytics help monitor freshness and reduce waste (Chaudhuri et al., 2018: 840-841). This gap highlights the need to explore how small Asian wholesalers can balance operational efficiency with sustainability and cultural adaptability.

The purpose of this thesis is therefore to analyse the key challenges faced by small Asian food wholesalers in Finland and to identify strategies that can improve their fresh food supply chain efficiency. The study employs a qualitative research design, using interviews with industry practitioners to gain insight into real-world operational practices. By integrating theoretical perspectives on supply chain management, cold chain logistics, and inventory control, this research seeks to provide actionable recommendations for small distributors striving to enhance performance in an increasingly competitive and sustainability-oriented market.

The findings of this research not only contribute to the academic understanding of small distributor dynamics but also offer practical implications for business operators, policymakers, and future researchers interested in the evolving food supply landscape of Finland.

2 Literature Review

As noted by (Hempel, S., 2020: 12), “The literature review helps to introduce the topic and place the new research into the context of existing knowledge.” In accordance with this notion, the content of this chapter discusses previous studies and debates concerning the development and challenges of Asian food distribution in Finland, thereby situating the present research within the broader scholarly context.

Recent scholarship has increasingly emphasized the interconnectedness of supply chain efficiency, sustainability, and technological innovation in the food industry. As digital transformation reshapes logistics and inventory management, small distributors face both opportunities and challenges in adopting advanced systems such as IoT monitoring, predictive analytics, and blockchain-based traceability (Tsang et al., 2018: 1435-1438; Jauhar et al., 2025: 108). Moreover, the growing emphasis on environmental responsibility and circular economy principles in the Nordic context has intensified the pressure for supply chain transparency and waste reduction (Närvänen et al., 2020: v-vi).

Despite these advancements, most existing studies focus on large multinational retailers or manufacturing firms, leaving a gap in understanding how small, ethnically, specialized wholesalers adapt to these global supply chain trends. This research therefore contributes to the literature by contextualizing supply chain management theories within the operational realities of small Asian distributors in Finland, highlighting the intersection of cultural, logistical, and economic factors shaping their business performance.

2.1 Food Supply Chain Management

Food supply chain management has emerged as an independent field of study, encompassing multiple levels from local to international and involving diverse stakeholders, including producers, processors, manufacturers, and retailers. Over time, supply chains have shifted from fragmented, independent systems to coordinated networks characterized by extended cycles, larger scale, systematic planning, information sharing, transparency, and traceability. Effective management of such supply chains is essential for ensuring the provision of safe and healthy food from “farm to table,” thereby contributing to social stability, public security, and individual well-being (2004:1-2). As illustrated in Figure 1, the product flow model presented by Bourlakis and Weightman (2004: 6) outlines the interconnected stages through which food moves from primary production to final consumption.

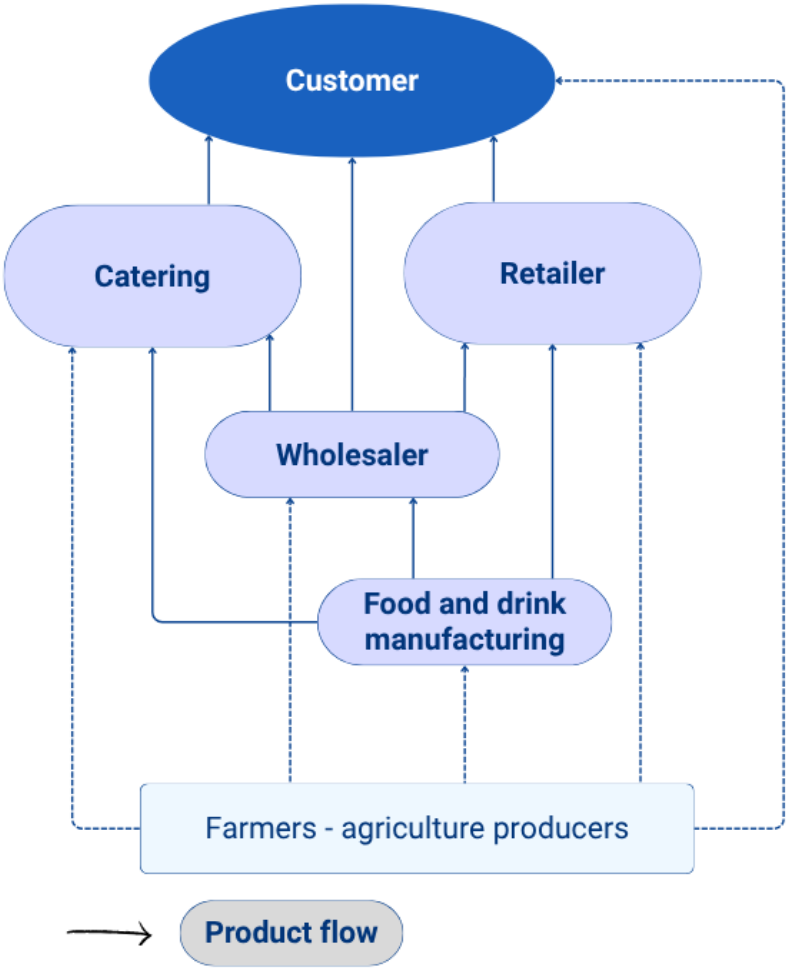

Figure 1. The food supply chain (Bourlakis and Weightman, 2004:6). The diagram excludes importing/exporting activities and focuses on product flow.

Figure 1 illustrates the structure of the food supply chain, which consists of three main stages: upstream agricultural producers, midstream food and drink manufacturers and wholesalers, and downstream retailers, catering services, and consumers. The product flow begins with raw material production and proceeds through processing, distribution, and finally to end consumption. Farmers supply raw ingredients to manufacturers, wholesalers distribute processed goods, and retailers and catering services deliver products to customers.

The figure highlights that the food supply chain is not linear but a dynamic interconnected network. Multiple channels exist among participants, allowing direct flows between producers, manufacturers, and retailers. Consumer demand also influences upstream operations, reflecting a demand-driven system within the global food supply chain.

2.1.1 Food Wholesale

Food wholesale serves as a crucial intermediary within the food supply chain, connecting producers, manufacturers, and food service operators. Dawson (2004: 116-118) highlights that wholesalers perform essential supply chain functions such as stockholding, assortment management, and redistribution, which stabilize the flow between production and retailing. These functions are particularly vital for perishable and diverse food categories, such as Asian food products distributed across Northern Europe, where product freshness and assortment flexibility are key to competitiveness.

From an international trade perspective, wholesalers also act as intermediaries that reduce transaction costs and overcome market entry barriers. Using Italian firm-level trade data, Bernard, Grazzi, and Tomasi (2015: 916) found that more than a quarter of exporters were wholesalers, particularly active in markets with high fixed costs and smaller demand. Their findings suggest that wholesalers play an efficiency enhancing role by consolidating exports and managing risk in geographically fragmented markets, a dynamic similar to Asian wholesalers in Finland who import diverse goods to serve small ethnic retailers and restaurants.

The interaction between wholesalers and HoReCa (Hotel, Restaurant, and Café) clients has become increasingly strategic. Hubeni et al. (2020: 25) demonstrated that HoReCa customers' purchasing decisions in wholesale markets depend on not only price and quality but also delivery frequency, reliability, and information support services. Similarly, Roy, Hall, and Ballantine (2019: 2-5) found that wholesalers enhance restaurant competitiveness by

connecting local producers and foodservice buyers, though they face challenges such as supply inconsistency, certification requirements, and limited communication with small farmers. These insights highlight that modern wholesalers must balance global sourcing efficiency with local responsiveness to meet the demands of diverse restaurant sectors.

Efficient logistics networks also strengthen the performance of food supply chains. Etemadnia et al. (2013: 80) show that strategically located wholesale hubs reduce transportation costs, improve inventory control, and enhance the freshness of perishable foods. For Asian food distributors in Finland, such logistical coordination combined with relationship-oriented service design forms the basis of sustainable competitiveness within multicultural food systems.

2.1.2 Food Retailing

Supply chain management (SCM) has become a strategic cornerstone in the modern food retailing sector, transforming traditional distribution channels into integrated systems driven by consumer demand and data transparency. Zentes, Morschett, and Scharamm-Klein (2007: 302) emphasise that SCM aims to integrate logistics, replenishment, and data flows across the value chain, enabling better alignment between supply and consumer demand. Efficient Consumer Response ECR and related tools such as continuous replenishment and vendor-managed inventory further enhance supply chain coordination by shifting systems from push to pull, improving freshness, and reducing excess stock (Zentes et al., 2007: 302-303). These developments support wholesales by strengthening forecasting accuracy and delivery reliability, factors that are particularly important for small distributors dealing with perishable foods.

In Finland, the structure of the grocery market also influences supply chain dynamics. Kronqvist (2010: 1) notes that the market operates as a concentrated mixed duopoly dominated by S-group and K-group, with the cooperative's lower-margin pricing behaviour overall pricing power. This environment places pressure on upstream suppliers, including small wholesalers, to operate

efficiently and meet stringent freshness and availability requirements. For small Asian food wholesalers in Finland, improving fresh food supply chain efficiency therefore depends on strengthening information sharing, enhancing replenishment accuracy, and maintaining reliable logistics performance within a retail system where high concentration heightens expectations for consistent quality and timely delivery.

2.1.3 Food Catering

The food catering sector represents one of the most dynamic components within the broader food supply chain, distinguished by its complex customer base that includes both businesses and final consumers. Dawson (2004: 116-121) highlighted that catering activities operate across two distinct sub-sectors, the profit sector, comprising restaurants, hotels, and fast-food outlets, and the cost sector, including public catering such as hospitals, schools, and workplaces. The catering industry has shown continuous expansion, especially in restaurant-based enterprises, which grew by 6,000 between 1996 and 2000. Unlike retailing or wholesaling, catering involves high gross value added but also bears high labour intensity and rapid stock turnover, reflecting the perishable nature of food and the necessity for fast inventory cycles (Dawson, 2004: 121).

The sector’s structure is fragmented, comprising both commercial restaurants and public institutions, which creates diverse sourcing and delivery demands (Dawson, 2004: 120). As a result, traditional cash and carry wholesale systems are increasingly replaced by delivery-based supply models, where wholesalers provide tailored logistics alongside product supply (Dawson 2004: 120). For small Asian food wholesalers operating in Finland, competitiveness therefore relies less on product price and more on offering temperature-controlled delivery and culturally specialised sourcing services aligned with catering requirements.

Digital tools further improve coordination between suppliers and catering businesses. Technologies such as electronic data interchange, scanning systems, and real-time traceability solutions can reduce waste and synchronise stock rotation with fluctuating demand (Bourlakis and Weightman, 2004: 3-4). These innovations are especially valuable for firms importing fresh products from Asia, as they allow better management of lead times and temperature risks when moving goods across long supply routes.

In the Finnish context, effective SCM in food catering is closely tied to regulatory oversight and food control systems. Saarimaa et al. (2024: 3) demonstrated that Finland's harmonized food inspection framework ensures long-term monitoring across 60 local control units, under the supervision of the Finnish Food Authority. Their six-year national study (2016-2021) revealed consistent non-compliance in critical area such as temperature management (7.1-8.1%) and cleanliness (4.4-5.3%) among food service establishments, with marked seasonal variations, non-compliance peaking in summer months (Saarimaa et al., 2024: 2-3). For small wholesalers supplying fresh or imported Asian ingredients, aligning with regulated cold-chain standards and traceability systems therefore becomes a source of competitive advantage, not merely legal compliance.

Overall, the integration of efficient logistical systems, digital traceability technologies, and robust food control frameworks forms the backbone of sustainable food catering SCM. For wholesalers and distributors, particularly in niche markets such as Asian food supply in Finland, aligning with such systems not only supports regulatory compliance but also ensures responsiveness to local market demands and seasonal consumption patterns.

2.2 Quality Management

Quality Management (QM) plays a central role in ensuring reliability, consistency, and consumer trust throughout the food supply chain. In modern food systems, quality is not limited to product attributes but extends to

documented processes, monitored logistics, and compliance protocols that ensure food meets expected standards. As Bourlakis and Weightman (2004: 2-3) notes, quality has become a strategic management tool throughout the chain, with food businesses increasingly required to follow specified quality assurance schemes and traceability controls from production to distribution.

The introduction of formal quality systems within the food chain has been strongly influenced by regulatory pressures and consumer risk concerns. High-profile incidents such as BSE and Salmonella led to expanding requirements for traceability and safety standards, including HACCP-based controls and retailer-driven protocols that affect manufacturers and wholesalers alike (Bourlakis and Weightman, 2004: 2). These systems demand reliable monitoring and documentation, making quality management not only a compliance activity but a supply chain coordination mechanism.

For small wholesalers, particularly import-oriented firms such as Asian food distributors operating in Finland, quality assurance becomes a prerequisite for commercial cooperation. Retailers and catering clients increasingly expect wholesalers to guarantee consistent storage conditions, reliable sourcing, and documented traceability. Aligning with regulated inspection frameworks is particularly important in Finland, where monitoring frequently identifies persistent non-compliance in critical risk areas such as food temperature and hygiene (Saarimaa et al., 2024: 1). Establishing verifiable QM practices therefore supports both legal compliance and supply reliability, reducing risks that could otherwise disrupt market relationships.

In summary, QM supports efficiency in fresh food supply chains by linking traceability, risk control, and regulatory compliance. For small Asian wholesalers in Finland, improving quality management, particularly through documented cold-chain handling and process traceability, can enhance customer confidence, reduce waste, and strengthen access to catering and retail markets where audited standards are increasingly demanded.

2.2.1 Food Waste Management

Food waste management has become a crucial component of food SCM, particularly in wholesale and retail sectors that handle perishable products. Hernández-Rubio et al. (2018: 1-6) emphasize that long traditional supply chains, involving multiple intermediaries such as wholesalers and importers, face greater challenges in maintaining transparency and food safety compared to short retailer-dominated chains. In these extended networks, wholesalers often play a dual role as resellers and quality inspectors, especially when importing goods from outside the EU, making them critical actors in ensuring product safety and minimizing waste (Hernández-Rubio et al., 2018: 6). These findings highlight the importance of establishing stricter certification systems and collaboration mechanisms within wholesale networks to enhance both food safety and sustainability.

At a global level, the management of perishable food supply chains (PFSCs) remains a key sustainability challenge. Kumar et al. (2020: 1809) identify poor cold-chain infrastructure, lack of coordination among suppliers, and limited government support as the most critical obstacles to sustainable PFSCs. Although their study focuses on a developing economy, these structural issues are also relevant to small and medium-sized import-based wholesalers in Finland, including those specializing in Asian food distribution, where supply chains are long, temperature-sensitive, and cross-border in nature.

Complementing these operational perspectives, Närvänen et al. (2020: v–vi) frame food waste as a “wicked problem” that transcends individual organizational boundaries and requires coordinated, systemic action across all actors in the food chain. This perspective aligns with the European Union’s sustainability agenda and underlines the need for integrated approaches combining technology, collaboration, and circular economy principles in wholesale food supply chains. For Finnish Asian wholesalers, this means that effective food waste management must incorporate not only logistical efficiency

but also adaptive governance and cross-cultural supplier cooperation to ensure both economic and environmental sustainability.

2.2.2 Cold Chain Logistics

Cold chain logistics (CCL) forms a critical part of fresh food supply chains by ensuring that temperature-sensitive products are stored and transported under controlled conditions to preserve their safety, quality, and market value. A well-managed cold chain minimizes the risk of microbial growth and spoilage, which are directly linked to deviations in temperature during handling and distribution (Ndraha et al., 2018: 15). As global sourcing grows in importance, especially among small wholesalers that import perishable goods, maintaining continuous temperature control becomes more complex and requires coordinated monitoring across multiple logistics stages (Chaudhuri et al., 2018: 841-842). Technological advancements have improved the monitoring capabilities of cold chains. Data-driven systems such as wireless sensors and digital analytics enable real-time tracking of temperature fluctuations, allowing operators to detect harmful variations and take corrective action before food quality deteriorates (Chaudhuri et al., 2018: 842-843).

Despite these tools, improper handling remains a key risk factor, particularly during loading and delivery, where products frequently experience temperature abuse, short exposure to unfavourable temperatures that can accelerate spoilage and raise safety concerns (Ndraha et al., 2018: 14). To address these vulnerabilities, structured risk analysis approaches can help identify critical control points. For instance, failure mode and effect analysis has been shown to support preventive decision-making by highlighting weak links in cold chain operations, including insufficient temperature checks and prolonged handling times (Wu and Hsiao, 2020: 21).

For small Asian food wholesalers in Finland, where imported fresh products often travel long distances, improving cold chain management is essential to reducing waste and enhancing supply chain efficiency. This requires not only

investment in reliable monitoring technology but also trained handling practices and systematic risk prevention to maintain product integrity across all stages of distribution.

2.2.3 Perishable Supply Chain Challenges

Perishable food products represent one of the most critical segments within the CCL system due to their limited shelf life and sensitivity to temperature fluctuations. These include fruits, vegetables, dairy, meat and seafood, which require continuous temperature control throughout the supply chain to maintain quality, safety, and nutritional value (Ali, Nagalingam and Gurd, 2018: 923). The logistics of perishable products thus demand integrated planning, advanced refrigeration technologies, and effective coordination among supply chain actors to mitigate product deterioration and financial losses.

Recent studies emphasise the importance of resilience in managing cold chains for perishable products. Ali, Nagalingam and Gurd (2018: 922-924) developed a resilience model demonstrating that perishable product supply chains are particularly vulnerable to logistics disruptions such as delays, equipment failure, and temperature breaches. Specifically, lacking these capabilities exposes firms to operational vulnerabilities such as temperature abuse identified as one of the leading causes of spoilage in cold chains (Ndraha et al., 2018: 12-21). Such temperature abuse typically occurs during loading, transportation, and delivery stages, when monitoring systems or handling practices fail to ensure proper control.

From a broader sustainability perspective, Närvämem et al. (2020: v-vi) explain that food waste, including waste stemming from perishable logistics failures, constitutes a wickled problem because it extends beyond individual firms and requires collaborative, system-level solutions. For small import-based wholesalers such as Asian food distributors in Finland managing perishable products therefore involves more than maintaining refrigeration. It requires building resilience through shared responsibility with suppliers, real-time

monitoring practices and coordinated handling procedures to reduce spoilage and prevent unnecessary food waste throughout the supply chain.

2.3 Inventory Management

Effective inventory management is critical for improving the efficiency of fresh food supply chains, particularly for small Asian wholesalers operating in Finland. Fresh products deteriorate rapidly, and wholesalers must make timely stocking decisions to prevent losses caused by spoilage and fluctuating demand. As Vázquez-Serrano et al., (2025: 1-2) explain, inventory decisions directly determine procurement quantities, storage needs and cost levels, while poor control increases both holding and waste-related expenses in perishable product supply chains. For small wholesalers operating with limited margins, maintaining excess stock increases financial risk, whereas stockouts may weaken business relationships with retailers who depend on stable delivery schedules.

Precise inventory control is closely linked to food waste management. Waste reflects inefficiencies and fluctuating demand throughout the food system and reducing inefficiencies at distribution stages can significantly decrease discard volumes (Närvänen et al., 2020: 5–6). For small distributors handling imported Asian foods, avoiding overstocking of slow-moving specialty items can improve cash flow, reduce waste, and support long-term sustainability. Furthermore, maintaining safety stock and strengthening supplier coordination supports firms' ability to respond to disruptions such as delays or shortages, especially in global supply operations (Guo et al., 2025: 450-451).

Additional, temperature-controlled handling is essential for maintaining product quality. Bourlakis and Weightman (2004: 179) emphasis that temperature control in storage and logistics significantly reduces spoilage and supports reliable supply performance. For small Asian wholesalers, even modest cold-chain investment can extend shelf-life, reduce deterioration and enable better inventory planning.

Overall, integrating perishability-focused inventory control, waste-preventive stock decisions and cold-chain discipline offers a foundation for small fresh food wholesalers in Finland to improve supply chain efficiency, limit financial risks and maintain competitiveness within a market reliant on diverse imported food products. The following section will further examine how specific valuation methods, particularly First-In First-Out (FIFO) and Last-In First-Out (LIFO) affect the accounting outcomes and strategic decision-making processes of distributors operating in volatile markets.

2.3.1 FIFO and LIFO policies

The selection of inventory valuation methods, particularly FIFO and LIFO, has been a focal point in accounting and logistics research. These methods significantly influence reported profits, tax obligations, and financial ratios, making their choice a strategic rather than merely technical decision. As Eilon (1961: 304-306) explains, FIFO and LIFO are not simply stock rotation policies but represent distinct valuation philosophies that impact both operational and financial performance. Under FIFO, the earliest goods purchased are the first to be sold, leading to lower cost of goods sold and higher ending inventory values during inflationary periods. Conversely, LIFO assumes that the most recently acquired items are sold first, thereby matching current costs with current revenues but often resulting in lower reported profits (Eilon, 1961: 307-309). Thus, the selection between these methods directly influences profit margins, working capital requirements, and pricing decisions, rather than merely altering financial statements.

Suviolahti (2009: 84-95) extends this discussion by analysing how volatile raw material prices complicate the application of FIFO and LIFO in practice. Through simulation modelling in a Finnish manufacturing context, he demonstrated that under high inflation and fluctuating input prices, LIFO and market-based valuation methods outperform FIFO in maintaining costing accuracy and reducing taxable income volatility. FIFO, although theoretically simple and widely used, tends to overstate profits in periods of rising prices,

leading to distorted financial information and potential liquidity issues when taxes are based on inflated accounting profits (Suviolahti, 2009: 95). In contrast, valuation methods such as LIFO or market-based approaches provide more accurate costing under volatility by aligning revenue with up-to-date purchase prices.

these findings are directly relevant to Finnish Asian food wholesalers, who import products such as rice, noodles, sauces, and frozen goods whose costs fluctuate due to exchange rates, logistics fees, and seasonal demand. In this context, selecting a valuation method is not simply a matter of financial reporting preference but a strategic tool for managing cash flow stability, tax exposure, and competitive pricing. As both Eilon (1961) and Suviolahti (2009) indicate, firms operating in volatile supply markets may benefit from valuation approaches that reflect current costs more accurately, helping wholesalers balance profitability with financial resilience. A flexible or hybrid policy inspired by LIFO principles may therefore support more stable pricing and investment decisions in the Finnish Asian food distribution sector.

In conclusion, FIFO and LIFO represent more than mere accounting conventions; they embody alternative approaches to managing financial volatility and inventory realism. Their selection should reflect a firm’s broader strategic priorities, whether emphasizing transparency and market comparability (FIFO) or cash flow protection and tax optimization (LIFO). For Asian food distributors in Finland, where raw material prices and demand are both highly dynamic, a flexible and well-documented valuation policy is essential to maintain competitiveness and financial stability.

2.3.2 Just-In-Time (JIT) Strategy

The JIT approach is a cornerstone of modern inventory management, aiming to synchronize material flow with actual demand to minimize waste and reduce inventory costs. As Bourlakis and Weightman (2004: 2-4) explain, the food supply chain is particularly time-sensitive, where product freshness, shelf life,

and responsiveness to consumer demand are essential. In such environments, JIT provides a strategic advantage by allowing materials or products to arrive exactly when needed, thus improving operational efficiency, and reducing capital tied up in stock.

Successful JIT implementation, however, depends heavily on cooperation across the supply chain. Yang et al. (2020: 1-5) define JIT supply chains as systems in which items arrive at the right place, at the right time, and in the right quantity through close coordination between suppliers and customers. Their empirical study demonstrates that the successful implementation of JIT depends heavily on demand-driven supply chain intelligence. Specifically, customer knowledge management, knowledge sharing, and inter-firm cooperation. These factors enhance visibility, reduce the bullwhip effect, and allow firms to match production capacity with real-time demand variations, forming the informational foundation for an effective JIT supply chain (Yang et al., 2020: 4-5).

In the food industry, JIT is closely associated with improvements in product quality and safety. He and Hayya (2002: 652-654) found that JIT implementation in food manufacturing reduces defect rates, enhances quality consistency, and lowers waste by aligning production more tightly with actual demand. Their research also indicates that JIT systems, when combined with quality control frameworks such as HACCP, can strengthen traceability and ensure timely responses to safety risks. However, they caution that perishable food products and volatile inputs make JIT adoption more challenging, as disruptions in supply or transportation can quickly result in stockouts or product spoilage (He & Hayya, 2002: 655-656).

For Finnish Asian food wholesalers, adopting JIT principles offers both opportunities and constraints. On one hand, it can reduce warehouse congestion and prevent overstocking of slow-moving or perishable products; on the other hand, long lead times and import dependencies from Asia limit full JIT implementation. Bourlakis and Wightman (2004: 165-166) note that hybrid JIT

systems for PFSCs, balancing efficiency, and resilience. Therefore, for distributors handling Asian food products in Finland, a flexible JIT strategy supported by supplier collaboration and accurate demand forecasting can improve product freshness, lower waste, and enhance financial sustainability.

2.4 Demand Forecasting

Demand forecasting is a critical element in inventory management and supply chain planning, particularly for industries handling perishable goods such as food. Thomopoulos (2015: 832-833) emphasizes that accurate demand forecasting enables firms to maintain the optimal balance between inventory levels and customer service, minimizing the risks of both stockouts and excessive holding costs. A reliable forecast serves as the catalyst that determines when and how much to order, directly linking sales projections to replenishment and purchasing decisions. He further notes that in multi-item systems such as distribution centres, forecast is revised monthly for each stock-keeping unit (SKU), aligning inventory control with real-time market fluctuations (Thomopulos, 2015: 833).

Within the food sector, forecasting assumes an even more strategic role due to time-sensitivity and quality-driven purchasing behaviour. Bourlakis and Weightman (2004: 1-3) emphasize that food supply chains operate under rapid consumer preference changes shaped by freshness, pricing, and seasonal variation. Anticipating these shifts enables wholesalers to avoid unnecessary inventory accumulation that leads to spoilage, while better matching supply to consumer demand. Thus, forecasting acts not only as an operational tool but also as a mechanism for maintaining product value and responsiveness in perishable markets.

From a sustainability and waste-reduction perspective, demand forecasting also contributes to minimizing food waste across the supply chain. According to Silvennoinen et al. (2015: 140-145), accurate demand estimation in Finnish food service operations significantly reduces unnecessary procurement and

overproduction. Their case study reveals that incorporating digital monitoring and real-time data analytics into forecasting can cut waste by up to 20%, highlighting the direct link between predictive accuracy and environmental efficiency. Their findings demonstrate that forecasting functions as a waste-prevention strategy by minimizing overproduction and over-purchasing.

For Asian food wholesalers operating in Finland, demand forecasting represents a vital strategic function connecting market demand variability with import-based supply operations. Many Asian food items, such as sauces, noodles, and frozen seafood, are shipped from Asia with long lead times. These items often arrive in bulk shipments, increasing that risk of surplus stock if demand is misjudged. By applying forecasting models that incorporate seasonality, cultural consumption patterns, and delivery variability, wholesalers can reduce spoilage, maintain freshness, and support more sustainable supply chain performance in niche ethnic markets.

2.4.1 Pricing Strategies

Pricing is one of the most powerful tools for retailers to manage perishable inventory efficiency and sustainably. Unlike durable goods, perishable products, such as fruit, vegetables, meat, and dairy, lose value over time, and retailers must dynamically adjust prices to match the product’s freshness and remaining shelf-life. Static or uniform pricing often results in excess unsold stock, while excessive markdowns reduce profit margins. Therefore, the balance between profit maximisation and waste reduction forms the foundation of modern pricing research for perishable goods.

Hasiloglu-Cifeciler and Kaya (2025: 3) argue that pricing and inventory control must be coordinated dynamically, since constant pricing fails to align demand with the deteriorating quality of inventory. Their bi-objective dynamic programming model shows that price differentiation between “new” and “old” stock increases profit and reduces waste by encouraging consumers to purchase older items before they expire. Retailers such as Tesco, Kroger, and

Walmart already apply multi-stage clearance systems that automatically discount near-expiry goods, achieving both higher revenue and reduced food disposal (Hasiloglu-Cifeciler and Kaya, 2025: 5-6). For instance, Tesco's multi-stage Clearance Pricing Optimisation system reduced fresh-food waste by 5% while increasing sales of "reduced-to-clear" items (Hailoglu-Cifeciler and Kaya, 2025: 5). These findings demonstrate that age-based dynamic pricing can directly contribute to Sustainable Development Goal 12 (Responsible Consumption and Production) by linking economic and environmental outcomes.

Figure 2 Sustainable Development Goals (Focus 2030, 2019)

Building upon this concept, Kayikci et al. (2022: 5-8) developed a four-stage data-driven optimal dynamic pricing model designed specifically for food retailers. The model introduces real-time IoT sensor data to determine freshness levels and update prices automatically throughout a product's sales

cycle. As illustrated in Figure 3. Hyperspectral imaging sensors are used to capture the freshness score of produce on shelves, which is then classified into four price stages:

- Stage 1 – Freshness stage (100-80%): premium price for newly stocked products.

- Stage 2 – Less fresh stage (80-60%): discounted price to accelerate sales before quality declines.

- Stage 3 – Redistribution stage (60-20%): heavy discount to redistribute edible items to discount markets.

- Stage 4 – Disposal stage (<20%): leftover stock disposed of at a loss.

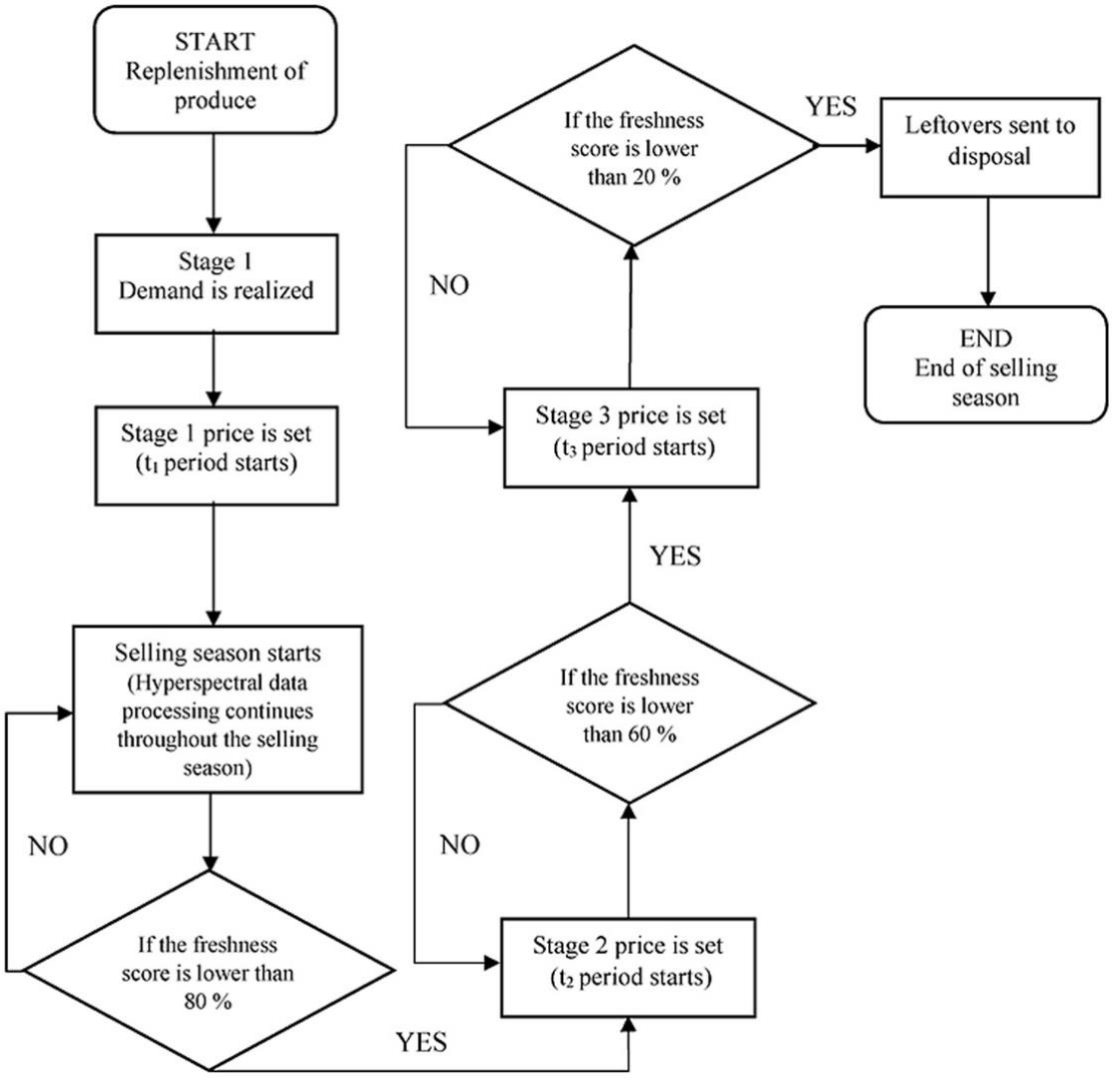

Figure 3 Flowchart of the solution approach (Kayikci et al., 2022: 8)

By integrating real-time freshness monitoring (via hyperspectral imaging, optical, and gas sensors) with dynamic programming, this approach enables retailers to adjust prices continuously in line with decay rates. The simulation results show that a moderate discount rate of around 7% maximised profit while reducing food waste to zero (Kayikci et al., 2022: 10). Beyond profit optimisation, the system contributes to sustainability by converting freshness data into actionable pricing signals, allowing retailers to avoid over-discounting while maintaining product quality perception.

In conclusion, dynamic pricing for perishable products is evolving from manual markdowns to automated models guided by freshness and decay rates. Both

Hasiloglu-Cifeciler and Kaya (2025) and Kayikci et al. (2022) demonstrate that price elasticity is dependent on time and product freshness, and that adaptive pricing significantly enhances profit while minimising waste. This evidence reinforces that freshness-based dynamic pricing offers a sustainable and economically viable solution for modern food retailing.

2.4.2 Sustainable Food Supply Chain

The Sustainable Development Goal 12 (SDG 12), Responsible Consumption and Production, aims to ensure efficiency resource use, minimize waste, and promote sustainable production and consumption across industries. According to the United Nations Development Programme (2024) and the Global Goals framework (2024), SDG 12 is central to achieving sustainability in the food sector, where resource inefficiency and food waste remain major global challenges.

Recent studies emphasize the role of technological innovation in achieving SDG 12 targets. For instance, Seyam et al. (2025: 1-2) introduced a stacking ensemble model integrating Random Forest, Support Vector Regression, XGBoost, and LSTM to forecast demand for perishable food products. Their study demonstrates that improved demand forecasting can help retailers better align procurement and inventory with actual consumption trends, thereby potentially preventing over-ordering and reducing waste at the retail stage. Their findings show that accurate forecasting serves as a preventive approach to food waste reduction, directly supporting SDG 12.3, which calls for halving global food waste by 2030.

At the systemic level, D'Adamo, Gastaldi, and Nallapaneni (2024: 1-3) highlight the need for pragmatic sustainability, which balances environmental, economic, and social dimensions. Their framework emphasises circular-economy strategies such as waste valorisation, resource recovery and consumer awareness initiatives, implemented through public-private collaboration. These

measures provide structural pathways to embed responsible production and consumption practices within the food system.

In the context of food distribution in Finland, integrating SDG 12 principles can help firms manage diverse, perishable inventories more efficiently. Applying data-driven forecasting, optimizing logistics, and reusing materials align operational practices with responsible consumption and production goals, contributing to Finland's transition toward a circular and low-carbon economy.

2.5 Integration of Food Supply Chain Functions

Integration of food supply chain functions refers to the coordination of key activities and relationships among actor from production to retail. In fresh food systems, especially for perishable products, such integration ensures products quality, environmental efficiency, and market responsiveness. Toniolo, Russo, and Bravo (2024: 46-47) emphasize that integrating upstream and downstream actions is crucial because environmental burdens are distributed across cultivation, processing, logistics, cold storage, and packaging.

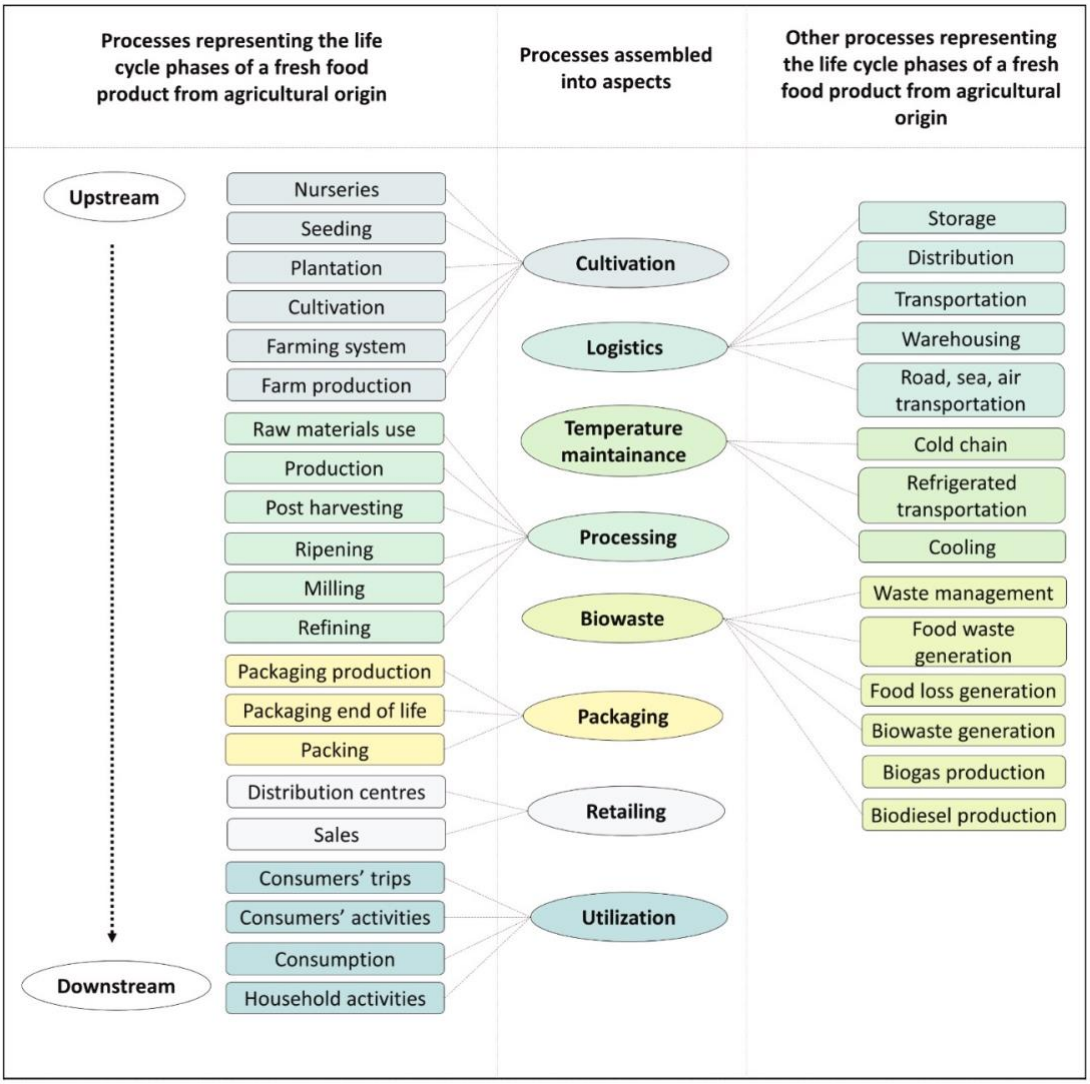

Figure 4 Processes assembled into aspects associated with a fresh food product's life cycle. (Toniolo et al., 2024: 51)

Upstream integration focuses on cooperation among farmers, producers, and processors. It includes resource efficient cultivation, technological innovation, and life cycle-based management practices. Toniolo et al. (2024: 47-49) emphasize that adopting a life cycle perspective allows actors to recognize environmental impacts and coordinate actions across the chain, such as reducing fertilizers, optimizing transport energy, and improving packaging operations.

According to Bourlakis and Weightman (2004: 2-4), the food supply chain has shifted from fragmented and competitive exchanges toward vertically integrated

and cooperative networks. Modern retailers and processors establish long-term partnerships with upstream supplier to maintain traceability and quality, supported by digital systems such as EDI and ERP.

Hellweg and Milà i Canals (2014: 1109-1111) highlight that life cycle assessment helps prevent burden shifting across the chain by identifying environmental hotspots throughout production, use and disposal phases. In food chains, this means that integrating upstream agricultural decisions with downstream logistics and consumer-side requirements is essential to avoid reducing impacts at one stage while increasing them at another.

As integration progresses toward downstream logistics and distribution, coordination supports temperature-controlled storage, optimal transport modes and waste reduction. Efficient upstream cultivation and packaging strategies reduce downstream energy consumption in cold chains and improve responsiveness in distribution networks (Toniole et al., 2024: 50). Such vertical cooperation enhances traceability, reduces operational burdens, and supports systemic is improvements rather than isolated actor level optimizations.

Overall, the integration of upstream and downstream functions fosters a holistic, environmentally conscious, and efficient food system thinking operational, informational, and relational dimensions throughout the entire chain.

3 Research Methodology

This study adopts a qualitative single-case study approach, which is appropriate for exploring complex and context-dependent business phenomena. As Yin (2018, pp. 50) explains, case studies allow researchers to investigate real-life situations where the boundaries between the phenomenon and its context are not clearly evident. The purpose of this research is exploratory, seeking to understand the operational challenges and improvement strategies of small Asian food distributors in Finland.

A qualitative approach is justified because existing literature on ethnic food distribution in Finland remains limited, and in-depth insights are required rather than statistical generalisation. Eisenhardt (1989, pp. 534–536) argues that qualitative case studies enable theory building from empirical evidence through iterative comparison between data and literature. Therefore, this approach is suitable for analysing managerial perceptions, supply chain practices, and contextual dynamics that shape business efficiency.

3.1 Research Design

The research follows a single-case study design, focusing on a Helsinki-based Asian food wholesaler that imports and distributes products from China, Thailand, Japan, and Vietnam. The company was selected through purposive sampling because it represents typical characteristics of small Asian distributors operating in Finland's multicultural market. According to Saunders, Lewis and Thornhill (2019, pp. 210–213), purposive sampling allows the researcher to select information-rich cases that can best answer the research question.

Data collection was conducted between August and October 2025. The case study combines primary qualitative data (semi-structured interviews) with secondary sources, including company documents, market reports, and academic publications. This mixed data design ensures triangulation between empirical evidence and theoretical concepts.

3.2 Data Collection

Primary data were obtained through one semi-structured interview with the operations manager of the selected company. The interview included ten open-ended questions that explored five themes: supplier relationships, cold chain management, inventory control, customer demand patterns, and strategic adaptation. The session lasted approximately 60 minutes, conducted in both English and Mandarin to facilitate clear communication.

The interview was recorded—with the participant's informed consent—and later transcribed verbatim for analysis. Semi-structured interviews were chosen because they provide both consistency and flexibility, enabling clarification and deeper probing when necessary (Saunders et al., 2019, pp. 440–441). Secondary data sources such as trade reports and company records were reviewed to complement the interview findings.

3.3 Ethical Consideration

The study followed ethical guidelines of Metropolia University of Applied Sciences. Participation was voluntary, and informed consent was obtained from all respondents. Company and personal names were anonymized to maintain confidentiality. Data were stored securely and used solely for academic purposes.

3.4 Research Limitations

While qualitative research provides rich insights, its findings are limited in generalizability. The single-case approach focuses on one company, and thus the conclusions should be interpreted as illustrative rather than representative of all Asian wholesalers in Finland. Future studies could combine interviews with quantitative surveys or multiple case comparisons to enhance external validity.

4 Case Studies

4.1 Case Company Background

The case company is a limited liability enterprise established in 2022 and headquartered in Helsinki, Finland. Operating within the grocery sector, it primarily serves Finnish restaurants, hypermarkets, and retail shops by supplying a broad range of Asian food products. Its product portfolio includes frozen meat, seafood, fresh vegetables, dairy products, canned foods, spices

and sauces, dried goods, and other related items. These offering cater to the culinary needs of customers seeking ingredients from Chinese, Japanese, Thai, Vietnamese, and other Asian cuisines.

The company adopts a cross-functional teamwork approach, whereby departments collaborate closely to achieve shared objectives. This model supports effective communication and improves efficiency in problem-solving. Internal communication is primarily conducted in Chinese and English, while communication with customers takes place in Mandarin, Cantonese, English, and Finnish. Multiple channels are used, including social messaging platforms, email, and phone. As a start-up, the company maintains a flexible organizational structure and emphasizes interdepartmental cooperation to foster business development and growth.

4.2 Case Company in the Finnish Market Context

The Finnish retail market exhibits characteristics of a duopolistic market structure, where two major retail conglomerates, namely S Group and K Group, dominate the sector. Although reported market shares vary across studies and years, research consistently indicates that the two groups collectively control the majority of the Finnish food retail market. This high level of market concentration has significant implications for small suppliers, who face limited bargaining power, reduced opportunities for innovation, and constraints on product differentiation. Moreover, dominant retailers may influence market prices and consumer choice by controlling access to distribution channels. Empirical evidence shows that concentrated market power within the Finnish food chain can contribute to price elevation and restrict market efficiency (Irz et al., 2013: 656-657).

This study focuses on small-scale Asian food suppliers in Finland, whose primary clientele includes Asian restaurants, specialty supermarkets, and grocery stores. Although these suppliers operate on a small scale and face structural limitations compared to larger distributors, their product portfolios are

highly specialized in Asian ingredients, enabling customer to find specific products that meet their cultural and culinary needs with precision.

Within this context, the case company serves not only as a supplier but also as a cultural intermediary. By importing and distributing products such as fresh vegetables, sauces, spices, and staple foods, the company plays a vital role in supporting the operations of both ethnic restaurants and mainstream retail outlets. Its multilingual communication capabilities and cultural proximity to Asian suppliers provide a distinct competitive advantage in sourcing and quality assurance.

However, as a relatively new market entrant, the company must also navigate challenges such as supply chain volatility, seasonal availability, and competition from established local and international distributors. The company's position thus reflects broader trends in Finland's food industry: a growing cultural diversification in food consumption, the increasing importance of reliable supply chains for fresh produce, and the need for specialized distributors to balance global sourcing with the dynamics of the local market.

4.3 Interview Transcript

1. From which countries/regions do you mainly import fresh food products?

We mainly source fresh vegetables from within the European Union, with the majority coming from the Netherlands due to its efficient logistics and stable supply. Our purchasing decision are price-driven, and we adjust our sourcing strategy according to market fluctuations. In addition to imports, we also buy certain products locally in Finland, such as cucumbers and Chinese cabbage, when the prices are reasonable.

2. What are the biggest challenges you face when sourcing fresh food?

Besides price, the main challenge we face when sourcing fresh food is maintaining consistent quality. In the past, we have received offers from

suppliers with competitive prices, but the product quality often failed to meet our expectations. For example, issues with freshness or inconsistent sizes. Through experience, we have learned to be more selective and now prefer to build long-term partnerships with reliable suppliers who can ensure stable quality, even if their prices are slightly higher than the market average.

3. How does seasonality affect the supply of fresh food?

Seasonality has a noticeable impact on the supply and quality of fresh vegetables. At the beginning of the season, the product we receive is often uneven in size or not yet fully mature, while towards the end of the season, it becomes more prone to spoilage. For instance, watermelons are a good example, their quality can vary significantly depending on the time of year. We closely monitor the quality of each shipment to decide when to stop importing certain products and shift to alternatives. In some cases, we also adjust our sourcing locations within the EU to maintain a stable supply.

Seasonality not only influences the quality of vegetables but also significantly impacts their prices. During certain seasons, prices can rise sharply, which directly affects our sales performance. Many of our customers, particularly restaurants, tend to modify their menus based on these price fluctuations. For example, by reducing their orders or temporarily switching to locally available alternatives. To cope with this, we monitor market trends closely and communicate with our clients in advance to help them adjust their purchasing plans.

4. How do you handle cold chain transportation and storage?

Our warehouse includes a cold storage section for fresh vegetables and a separate area for dry goods, both located within the same facility for operational efficiency. We work with specialized logistics partners who provide cold chain transportation services, ensuring that products are kept at controlled temperatures during transit from suppliers to our warehouse.

Once the pallets arrive, our staff unload them as quickly as possible to avoid stacking and prevent heat build-up, which could accelerate spoilage. This practice has significantly improved product freshness. In the past, when shipments arrived on weekends and unloading was delayed until Monday, we often observed a decline in quality. Now, through prompt handling and regular quality checks, we are able to maintain the freshness of our vegetables and extend their storage life.

5. During distribution, which stages are most likely to affect freshness?

During distribution, the stages most likely to affect freshness are transportation and unloading. If delivery takes too long or the temperature fluctuates during transit, vegetables can easily lose moisture or start to spoil. In peak periods, temporary stockpiling in the warehouse can also reduce air circulation and cooling efficiency. To minimize these risks, we try to shorten transportation times and require drivers to maintain stable cold chain temperatures throughout the journey.

6. Who are your main customer groups (restaurants, supermarkets, individual consumers)? How do their needs differ?

Our main customers are restaurants and supermarkets. Restaurants usually purchase a fixed range of vegetable that are essential for their regular menus, so their orders are relatively stable throughout the year. Supermarkets, however, tend to adjust their product selection according to seasonal availability and changing consumer preferences. They are generally more price-sensitive and may place smaller but more frequent orders to keep their shelves well stocked with fresh products.

7. Which fresh food products are most popular, and how has demand changed in recent years?

Red and green bell peppers, carrots, iceberg lettuce, cabbage, and cucumbers are among our best-selling fresh products, with demand remaining quite stable

over the years. However, the demand for vegetables such as broccoli, cauliflower, and celery tend to vary more, depending largely on price fluctuations and seasonal supply conditions. In recent years, we have also noticed a gradual increase in demand for salad ingredients, reflecting a growing consumer interest in healthy eating habits.

8. How do Finnish consumers perceive and accept Asian fresh food?

Currently, the most common categories of Asian cuisine in Finland are sushi, Chinese food, and teppanyaki. Many restaurants serve buffets during lunchtime and switch to à la carte menus in the evening. Overall, Finnish consumers have become increasingly open to Asian flavors. Ingredients such as bok choy, bean sprouts, and tofu are now more commonly accepted and recognized in the local market, showing a gradual shift toward greater appreciation of Asian fresh food.

9. What trends do you see in the future of the fresh food market in Finland?

Compared with local suppliers, Asian importers have both advantages and disadvantages in fresh food distribution. The main advantage lies in product variety and cultural specialization. We can supply authentic Asian vegetables and ingredients that local distributors typically do not offer, enabling restaurants to prepare more traditional and diverse dishes. Our close relationships with Asian producers also allow us to identify new market trends more quickly.

On the other hand, importing fresh food involves greater logistical challenges. Long transportation distances, customs clearance, and fluctuating shipping costs can affect both freshness and pricing. Maintaining a stable cold chain throughout the supply process requires close coordination with logistics partners. In contrast, local suppliers benefit from shorter supply chains and faster delivery times, which naturally help preserve freshness.

10. Compared to local suppliers, what advantage and disadvantages do you have as an Asian importer in fresh food distribution?

Advantages	Disadvantages
Ability to communicate directly with Asian suppliers in the native language, improving procurement efficiency.	Higher logistics costs due to longer transport distances and expensive cold chain maintenance.
Better understanding of Asian consumer and restaurant preferences, enabling quicker quality control.	Short shelf life of fresh food, with longer transport increasing freshness risks.
Ability to provide unique Asian fresh ingredients less available in local or EU markets.	More vulnerable to EU and Finnish food regulations and inspection requirements.
Helps restaurants and supermarket diversity their product range to meet varied market demand.	Some products lack price competitiveness compared to local suppliers.
Dual role (B2B & B2C) enables quicker adaptation to consumption trends.	Limited awareness of certain Asian ingredients among Finnish consumers, requiring time and effort to build demand.
-	High dependency on specific supply chains, making them vulnerable to climate, transport, or geopolitical disruptions.
-	Higher inventory risks, as unsold fresh food leads to greater waste.

5 Results

This chapter presents the main findings derived from the interview with the case company, which operates as a small-scale Asian food distributor in Finland. The results are organized thematically into five key areas: sourcing and supply chain management, cold chain and freshness maintenance, customer segmentation and demand patterns, consumer perception and market acceptance, and the competitive advantages and challenges faced by Asian importers in the Finnish fresh food sector.

5.1 Sourcing and Supply Chain Management

The findings reveal that the company primarily sources fresh vegetables from within the European Union, with the Netherlands serving as its main supplier due to efficient logistics and stable supply. Price remains a major consideration in procurement decisions; however, maintaining consistent quality is a higher priority. The company occasionally purchases locally produced items in Finland, such as cucumbers and Chinese cabbage, when prices are favourable.

Ensuring consistent quality was identified as one of the most significant challenges in the sourcing process. The company has encountered cases where suppliers offered competitive prices but failed to meet required quality standards, such as freshness or uniformity of size. Over time, it has developed a selective procurement strategy, maintaining long-term partnerships with reliable suppliers even when their prices are above the market average. This approach helps safeguard product quality and reduces risks associated with unreliable supply.

Seasonality also plays a crucial role in shaping both supply and pricing. At the beginning of each season, vegetables tend to vary in size and maturity, while at the end of the season they are more prone to spoilage. Seasonal changes in production volumes and transportation conditions within Europe can significantly affect supply stability. To mitigate these risks, the company closely

monitors market trends and adjusts sourcing locations within the EU to ensure both consistent supply and quality.

5.2 Cold Chain and Freshness Maintenance

The company maintains an integrated warehouse facility that includes a cold storage section for fresh vegetables and a separate area for dry goods. It collaborates with professional logistics partners to manage cold chain transportation from suppliers to the warehouse, ensuring that products are kept at controlled temperatures during transit.

Operational efficiency plays a key role in maintaining freshness. Upon delivery, pallets are unloaded immediately to prevent heat build-up and moisture accumulation that could accelerate spoilage. This practice has proven effective; previously, when deliveries arrived on weekends and unloading was delayed, a noticeable decline in quality was observed. By implementing prompt unloading and regular quality checks, the company has been able to extend the shelf life of its fresh produce and maintain consistent quality standards.

These observations align with existing research emphasising that uninterrupted cold chain management is fundamental for maintaining product quality in perishable supply chains. Reliable temperature control during transportation, handling and storage reduces microbial risks and decay, thereby supporting product safety and extending shelf life. Effective cold chain practices also contribute to reduces waste and improved consumer confidence, as poorly controlled temperature fluctuations are directly linked to spoilage and loss of food quality. This is consistent with findings showing that temperature abuse in chilled food chains leads to compromised safety, diminished freshness, and increased food waste if not properly managed (Ndraha et al., 2018: 49-55).

5.3 Customer Segmentation and Demand Patterns

The company’s main customers are restaurants and supermarkets. Restaurants typically purchase a fixed range of vegetables that are essential for their menus,

resulting in relatively stable demand throughout the year. In contrast, supermarkets adjust their product selections according to seasonal availability and consumer trends. They tend to be more price-sensitive and often place smaller but more frequent orders to ensure continuous product freshness.

The interview findings indicate that red and green bell peppers, carrots, iceberg lettuce, cabbage, and cucumbers are among the best-selling items. The demand for other vegetables, such as broccoli, cauliflower, and celery, fluctuates more significantly depending on market prices and supply conditions. Furthermore, the company has observed a gradual increase in orders for salad ingredients, reflecting the growing popularity of fresh, health-oriented food choices among consumers. This shift has encouraged supermarkets to expand their fresh vegetable assortment and maintain frequent restocking to meet evolving customer expectations.

5.4 Consumer Perception and Market Acceptance

The findings indicate that Finnish consumers have become increasingly receptive to Asian cuisine and ingredients. The most common categories of Asian food in Finland include sushi, Chinese cuisine, and teppanyaki. Many restaurants operate buffet-style at lunchtime and offer à la carte dining in the evening, showing diversification in dining concepts.

Fresh Asian ingredients such as bok choy, bean sprouts, and tofu are becoming more familiar and accepted in the local market. Their presence in both restaurant kitchens and retail shelves suggests that Asian food culture is steadily integrating into everyday eating habits. This shift is particularly visible in larger cities, where multicultural populations and international food trends contribute to more diverse consumer preferences. As familiarity increases, consumers appear more willing to try new flavours and incorporate Asian products into their regular food choices, encouraging retailers and restaurants to expand their offerings accordingly.

5.5 Competitive Advantages and Challenges of Asian Importers

Compared with local suppliers, Asian importers in Finland have both distinct strengths and notable challenges. The main advantage lies in their ability to offer a wide range of authentic Asian ingredients that local distributors typically do not provide. This product diversity enables restaurants to create more traditional and varied dishes, meeting the needs of Finland's growing multicultural market. Additionally, cultural understanding and direct communication with Asian suppliers enhance efficiency and quality control.

However, several challenges persist. Importing fresh products involves longer transportation distances, higher logistics costs, and stricter cold chain management requirements. Seasonal instability, customs clearance procedures, and fluctuating international shipping costs further complicate operations. As Liu and Irz (2016) noted, smaller ethnic distributors in Finland face structural disadvantages due to the dominance of large retail groups, which limits their bargaining power and market access.

Overall, while Asian importers play an essential role in diversifying Finland's food market, their success depends on balancing authenticity with efficiency—ensuring freshness despite long supply routes, maintaining compliance with EU regulations, and increasing consumer awareness of lesser-known Asian ingredients.

6 Discussion

The findings of this study highlight the operational characteristics and challenges faced by small-scale Asian food distributors in Finland's fresh food market. The company's sourcing strategy emphasizes quality and reliability over price, demonstrating the importance of trust and supplier consistency in managing perishable goods. Although the firm compare suppliers based on market rates, it prioritises long-term relationships with partners capable of meeting freshness and size uniformity requirements. This selectiveness

suggests that, in perishable food distribution, reliable supply is a competitive asset and that higher procurement costs can be offset by reduced waste and better customer satisfaction.

Seasonality emerged as a key factor affecting both product availability and procurement decisions. Early and late season produce was found to be more vulnerable to variation in size, maturity, and shelf life, shaping the company's decision to adjust sourcing locations within the EU. This behaviour highlights the role of flexible sourcing strategies in responding to fluctuating agricultural conditions. The company's ability to switch between regional suppliers within Europe contributes to supply continuity while limiting the risks associated with unstable harvest cycles.

Effective cold chain management was identified as another essential operational priority. The case company's practice of immediate unloading, combined with systematic quality inspections, has reduced spoilage linked to heat or moisture exposure during delivery. Previous operational experiences showed that delays in unloading led to diminished freshness, underscoring the practical impact of temperature control on product quality. Although outsourcing transportation provides flexibility, it also reduces direct oversight of handling practices. As a result, close coordination with logistics partners is necessary to maintain cold chain integrity across multiple supply chain actors.

Customer segmentation also shapes the company's strategic approach. Restaurants' stable purchasing behaviours provide predictable demand, whereas supermarkets require more frequent deliveries and greater responsiveness to market trends. Managing these two customer groups requires balancing consistency with flexibility: securing dependable volumes for restaurant clients while adapting to fluctuating orders from retailers. The gradual increase in sales of salad ingredients further indicates an evolving preference for fresh and health-oriented food choices among consumers. This trend encourages the company to diversify its product offerings and maintain higher freshness standards to meet retail expectations.

The results additionally reflect broader cultural dynamics in Finland's food market. Growing consumer interest in Asian cuisine has expanded opportunities for specialised importers, particularly those able to offer authentic ingredients not commonly distributed by mainstream suppliers. However, limited awareness of lesser-known products presents a market development challenge, requiring continuous communication with both restaurants and retailers. As familiarity increases, there is potential for incremental growth in product variety, but success depends on educating customers and maintaining consistent quality.

Finally, the study highlights the dual nature of competitive advantage for small Asian importers. On one hand, cultural knowledge, product authenticity, and direct contact with Asian suppliers offer differentiation in a concentrated retail market. On the other hand, long-distance sourcing, stricter logistics requirements, and limited bargaining power increase operational vulnerability. These findings suggest that sustainable competitiveness depends not only on offering unique products but also on building resilient supply chains, controlling waste, and strengthening relationships with buyers and logistics partners.

Overall, the discussion shows that successful positioning in Finland's fresh food sector requires a balance between cultural specialization and operational efficiency. The case company demonstrates that small distributors can operate effectively in a competitive market by combining selective sourcing, disciplined cold chain management, and market responsiveness. Although structural limitations remain, these strategies allow Asian importers to establish meaningful market niches while contributing to the diversity of Finland's food landscape.

7 Conclusion

This study examined how small Asian food wholesalers in Finland can improve the efficiency of their fresh food supply chains. The research aimed to identify operational challenges, assess supply chain management practices, and explore opportunities for improvement within Finland's competitive and highly

concentrated grocery market. Using a qualitative case study approach, the study collected primary data through an in-depth interview with a Helsinki-based distributor and supported the analysis with relevant literature on cold chain management, inventory control, and consumer behaviour.

The findings reveal that although small distributors face several structural constraints, such as limited scale, high logistics costs, and seasonal volatility, they also possess distinct competitive strengths. These include cultural expertise, close supplier communication, and flexible operations. Maintaining consistent product quality emerged as a key priority, often taking precedence over price competitiveness. This highlights the importance of trust-based supplier relationships, selective sourcing, and continuous monitoring of product standards. In addition, effective cold chain management was found to be essential for reducing spoilage and maintaining freshness, particularly through immediate unloading, appropriate temperature control, and efficient logistics coordination.

Customer segmentation plays a central role in shaping distribution strategies. Restaurant clients tend to maintain stable and predictable orders based on fixed menus, while supermarkets are more responsive to market fluctuations, adjusting their purchasing patterns according to seasonal supply and consumer preferences. This dual market dynamic requires small distributors to balance stability and flexibility in their operations. Furthermore, Finnish consumers have become increasingly receptive to Asian cuisines and ingredients, which suggests opportunities for further market expansion. However, consumer awareness of some niche Asian products remains limited, highlighting the importance of education and targeted marketing.

Strategically, the findings suggest three main pathways for improving supply chain efficiency among small Asian food wholesalers: digitalization, collaboration, and adaptive inventory management. Implementing digital tools such as IoT-based temperature monitoring, data analytics, and demand forecasting could enhance supply chain visibility and responsiveness.

Collaboration with logistics partners and other distributors may reduce operational costs and improve delivery reliability. Moreover, combining Just-in-Time (JIT) principles with flexible safety stock policies can help distributors balance freshness with risk management. Together, these strategies can transform traditional small-scale operations into resilient, data-informed systems capable of competing in a demanding market environment.

Nevertheless, small Asian wholesalers must also navigate significant external challenges. Finland's retail sector remains dominated by a duopolistic market structure, limiting smaller suppliers' access to major distribution channels. Additionally, dependency on long-distance imports exposes companies to risks related to transport delays, customs procedures, and fluctuating shipping costs. Addressing these barriers requires both internal innovation and broader institutional support to promote inclusivity and sustainability within the national food distribution ecosystem.

In conclusion, the efficiency and competitiveness of small Asian food distributors in Finland depend on their ability to integrate cultural specialization with operational modernization. By embracing digital transformation, strengthening collaborative networks, and adopting adaptive inventory models, these companies can enhance both their performance and resilience. The insights generated from this study not only contribute to understanding the Finnish context but also provide practical implications for other small ethnic food distributors across Europe seeking to balance authenticity, efficiency, and long-term sustainability.

7.1 Limitations and Future Research

While this study provides meaningful insights into the operations of small Asian food wholesalers in Finland, several limitations must be acknowledged. Firstly, the research was based on a single case study, which limits the generalizability of its findings. Although the selected company is representative of many small

distributors, the results may not capture the full diversity of practices across other ethnic or local wholesalers operating under different conditions.

Secondly, the study primarily relied on qualitative data from interviews. While this approach offered rich, contextual insights, it lacked quantitative metrics such as cost efficiency, delivery performance, and waste reduction rates. Future studies could therefore employ a mixed-methods approach, combining interviews with survey data or performance analytics to provide a more comprehensive assessment of supply chain efficiency.

Thirdly, the research was conducted within a specific time frame and geographical setting. External factors, such as seasonal variations, global supply disruptions, or changes in EU import regulations, may influence the stability and adaptability of food distribution systems. Longitudinal studies or cross-country comparisons could therefore provide deeper understanding of how small distributors adjust to changing market and policy environments.

Future research could also investigate the role of digital technologies in improving small distributors' operational efficiency. Tools such as blockchain for traceability, IoT for temperature monitoring, and AI for demand forecasting could enhance transparency and decision-making. Comparative studies between Nordic or European markets may also help identify how policy frameworks, consumer trends, and cultural factors shape the competitiveness of ethnic food distributors.

Overall, while this study offers an important step toward understanding the dynamics of small Asian wholesalers in Finland, further empirical and comparative research is needed to build a more comprehensive framework for achieving sustainable and efficient fresh food distribution in multicultural markets.

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Appendices

Sample interview questions

1. From which countries/regions do you mainly import fresh food products?
2. What are the biggest challenges you face when sourcing fresh food?
3. How does seasonality affect the supply of fresh food?
4. How do you handle cold chain transportation and storage?
5. During distribution, which stages are most likely to affect freshness?
6. Who are your main customer groups (restaurants, supermarkets, individual consumers)? How do their needs differ?
7. Which fresh food products are most popular, and how has demand changed in recent years?
8. How do Finnish consumers perceive and accept Asian fresh food?
9. Compared to local suppliers, what advantage and disadvantages do you have as an Asian importer in fresh food distribution?
10. What trends do you see in the future of the fresh food market in Finland?