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Optimization of direct supply chains in the restaurant industry: Addressing key challenges through technological innovation

■ **Abstract.** This study aimed to explore the potential of different supply channels in the restaurant industry, with a focus on optimizing direct supply using advanced technologies. By applying economic and statistical methods, the research analyses the role of large distributors and wholesalers in the United States food supply chain. While these supply chain participants support restaurant and manufacturer operations, they can also increase costs, reduce marketing and logistics control, and hinder the development of customer relationships. Direct supply presents significant advantages, such as improved brand loyalty, higher profit retention, and access to high-quality products. However, its growth is constrained by challenges like high marketing expenses and the implementation of same-day delivery. These costs include investments in advertising, technology platforms, CRM systems, and staff remuneration. Key obstacles to same-day delivery include staff shortages (especially drivers), high delivery costs, and inefficient logistics. The study suggests that technological solutions, including the development of direct access networks, automated promotional tools, and logistics infrastructure, can help mitigate these challenges. The Sample Box Marathon and Rgand Prime Fulfilment platforms are analysed as practical solutions that reduce costs and improve profitability. The findings of this research can provide valuable insights for producers and restaurants looking to optimize their supply chain operation

■ **Keywords:** distributors; wholesalers; same-day delivery; technology; customer loyalty; brand development

■ INTRODUCTION

The issue of choosing the most profitable and efficient supply channels, particularly in the restaurant industry, is a topic of active discussion among marketers and academics. For restaurants, choosing the right supply channel means being able to get a wide range of products of the right quality in the right time frame. For producers, the choice of distribution channel should be such that it takes into account both the needs of the consumer and their own, maximizing profits and minimizing costs. In the United States (US), wholesalers and distributors play an important role in the food industry, generating a significant share of the government's revenue. Most of their customers are independent restaurants, which are an integral part of the economic,

social and cultural life. During the spread of the COVID-19 epidemic, many suppliers were threatened with bankruptcy, and this was a time when restaurants realized the importance of working directly with producers, as noted by E. Amel *et al.* (2020). US legislation is aimed at supporting the development of small farms that supply products to restaurants and beyond (O'Hara *et al.*, 2021). At the same time, such development is still hampered by a number of problems, such as high initial costs, as well as a lack of knowledge, human capital, etc. Therefore, optimizing direct supply in the restaurant industry is a crucial task both at the state level and at the level of individual business entities, and is a topical issue for discussion among scientists.

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Z.T. Plakias *et al.* (2020) noted the growing popularity of short supply chains among farmers in the United States. At the same time, the study highlights certain barriers to the development of this area related to the specifics of the industry. In particular, farmers are more likely to sell their products directly than livestock producers, and new farmers prefer direct sales. Researchers see the solution to the problematic issues in appropriate policy decisions, while a number of studies have revealed the pivotal role of technological means of optimizing direct supply. J.K. O'Hara & S.A. Low (2020) concluded that online marketplaces are a key tool for facilitating the development of DTC. It allows increasing competitiveness, as well as reducing the cost of finding customers and transportation. The researchers pointed out that online marketing offers great potential not only for metropolitan farms, but also for remote ones, for which access to customers depends on distance. J.L. Durant *et al.* (2023) found that online marketing and online sales increase farm resilience, particularly after the start of the global pandemic. The researchers emphasized that supporting small farmers engaged in direct-to-consumer sales is a strategic policy direction in the face of constant long-term and short-term disruptions in the agricultural sector. Other innovative solutions to support direct sales have been identified in some studies. M. Sitaker *et al.* (2020) described the Farm Fresh Food Box market innovation, which involved the sale of boxes of farm products directly to consumers. The researchers noted that this approach is an alternative way to expand the customer base and strengthen the brand for small producers.

In summary, direct sales are a promising choice for restaurants and farmers due to a number of the above advantages. However, it will take time and the implementation of effective solutions to overcome the barriers that hinder the development of this area. One of the important ways to optimise this is through the use of modern technologies and innovative solutions. The purpose of this study was to explore the possibilities of using alternative supply channels for restaurants and manufacturers and to identify areas for optimizing direct supply through the introduction of new technologies: Direct Trade Foundation, Sample Box Marathon and Rgand Prime Fulfilment. The objectives of the study were to determine the role of large distributors and wholesalers in the supply chain in the US restaurant industry and identify the market potential for manufacturers using direct supply; to analyse the marketing costs faced by manufacturers and the obstacles to the implementation of same-day delivery logistics; to investigate the impact of wholesalers and distributors on manufacturers' profits and characterize the additional costs they bring to the supply chain (Boston Consulting Group (BCG), 2022); to summarize the benefits that manufacturers receive from direct supply.

■ MATERIALS AND METHODS

The study used a system of scientific methods that allowed for the relevant analysis and description of the results. Economic and statistical analysis was the main method used to analyse the role of large distributors and wholesalers in the supply chain of the US restaurant industry. In addition to traditional methods, the integration of advanced technologies such as Artificial Intelligence (AI) and Blockchain has the potential to significantly enhance supply chain

efficiency (Deloitte, 2023). AI can improve demand forecasting, automate inventory management, and streamline logistical operations, reducing costs and minimizing waste. Blockchain, on the other hand, provides transparency and security in tracking product movements, improving quality control and reducing risks associated with food safety. These technologies are becoming essential elements for further optimizing supply chain operations.

This method allowed us to analyse the structure of food distribution companies in the US by business type, the structure of food distributors' customers by business type, and the food service market shares covered by companies in the US. In addition, the article uses economic and statistical analysis to show changes in the values of the market capitalization and value of Sysco and US Foods over time. The method allowed comparing the results of the mentioned companies, which contributed to a deeper understanding of their role in the market. In addition, economic and statistical analysis was used to characterize the DTC Food Market size, including forecast values, which supported the conclusions about the market's potential and factors hindering its development. In addition, the method was used to analyse the percentage of companies (by volume of goods or services sold) that provide express or same-day delivery services. This made it possible to draw conclusions about the level of implementation of these delivery methods and confirm the existence of problems in this area in the DTC sector. The study compared the advantages and disadvantages of direct and indirect distribution channels. This comparison made it possible to evaluate distribution channels based on such criteria as control capabilities, impact on costs and profits, customer relations, impact on logistics, and delivery time. The use of the descriptive method allowed for a detailed and thorough description of the results. This method played a special role in characterizing the key technologies studied, namely the Direct Trade Foundation, Sample Box Marathon and Rgand Prime Fulfilment. The method allowed us to explain how these technologies work together to increase the chances of direct sales success, and what tools and tactics are used to do so.

The information base of the study was based on scientific and marketing articles, as well as information available in the public domain on the following resources: IFDA (The Economic Impact of the..., 2023), Seeking Alpha (Brink, 2022), Yahoo Finance (2024a; 2024b), GourmetPro (The Top 16 Food Distributors in the USA, 2024), Meticulous Research (DTC Food Market by Type, 2024), At the Margins (Anderson, 2022), Zoom2u (Effective Strategies for..., 2024), Investopedia (Ross, 2024), Masson International (Masson, 2024), McKinsey & Company (2023), The Food Institute (Wiklund, 2020), Rgand (2024). In addition, the study was based on the results presented in analytical reports, including The State of the Direct-to-Consumer (DTC) Industry – 2022 (Naceva, 2024) and State of Rural Enterprise Report (NICRE, 2024).

■ RESULTS

The role of large distributors and wholesalers in the supply chain in the US restaurant industry. These large distributors often serve as middlemen, offering restaurants a broad selection of goods while taking over logistical

operations. However, reliance on such intermediaries leads to higher costs and less control over marketing and logistics processes, limiting producers' direct access to customers. The food distribution industry in the United States generates about \$382 billion in sales per year and makes a significant contribution to the country's gross domestic product (GDP), which reaches \$87 billion (The Economic Impact of the..., 2023). When looking at the industry by type of distributor, it is worth noting that most companies are multidisciplinary distributors that provide their customers with a wide range of services (Fig. 1). Such companies offer a diverse range of products for different foodservice establishments. This state of affairs suggests that the US food distribution industry is able to meet a wide range of customer needs. The high share of multi-product distributors indicates a desire to minimize the number of supplies and simplify the procurement process, which reduces logistics costs and saves time.

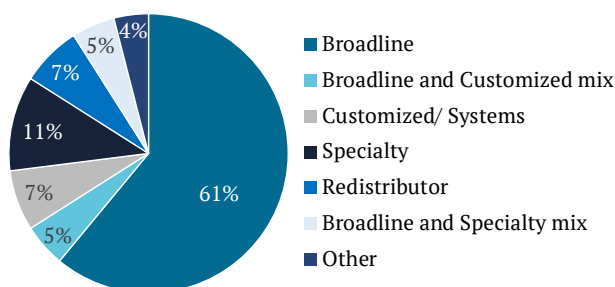


Figure 1. Breakdown of food distribution companies in the US by business type

Source: compiled by the author on the basis of The Economic Impact of the U.S. Foodservice Distribution Industry (2023)

Due to the fact that multidisciplinary distributors provide comprehensive services and can meet virtually any customer need, these companies are usually highly competitive in the market. The main customers of food distributors are independent restaurants, which account for more than half of the distributors' customer base (Fig. 2). Chain restaurants are second, accounting for almost 22% of the total number of customers. The differences in the provision of services to independent and chain restaurants may be that the former ones require a more personalized approach, including the need to provide a wide range of products. Therefore, food distribution companies in the US must meet high standards and be flexible and proactive enough to meet the needs of their key customers.

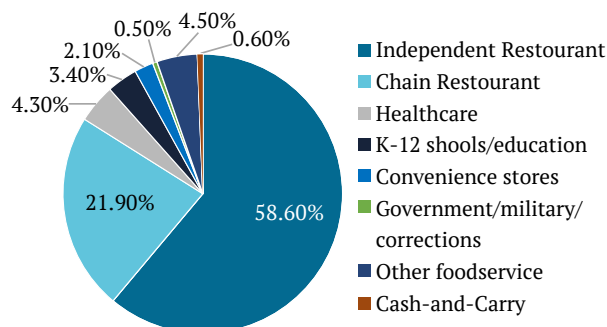


Figure 2. Breakdown of food distributors' customers by business type

Source: compiled by the author on the basis of The Economic Impact of the U.S. Foodservice Distribution Industry (2023)

Sysco and US Foods are the largest multiservice food distributors in the US. As shown in Figure 3, together these companies cover about a quarter of the foodservice market.

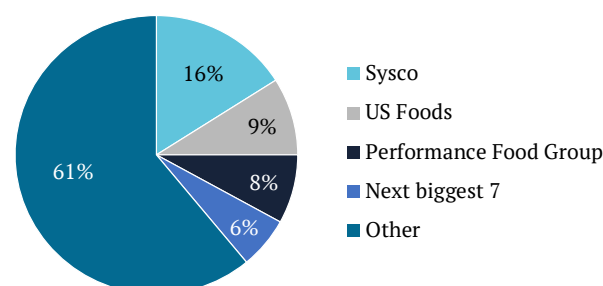


Figure 3. Foodservice market shares held by companies in the US

Source: compiled by the author on the basis of J.J. Brink (2022)

The Profit Margin for Sysco is 2.48%, while for US Foods this indicator reaches 1.42%. The Return on Equity (ROE) for Sysco reaches 99.41%, while for US Foods it is 10.86% (Yahoo Finance, 2024a; 2024b). Thus, both of these companies are profitable, but Sysco is much more efficient in using its equity to generate profits. Sysco's market capitalization and value are also significantly higher than US Foods', as can be seen in Figure 4. Sysco and US Foods combined cover over 25% of the U.S. foodservice market. Sysco, the larger of the two, maintains a competitive edge in terms of market share and profitability, with a 2.48% profit margin compared to US Foods' 1.42%. The return on equity (ROE) for Sysco reaches 99.41%, while US Foods stands at 10.86%.

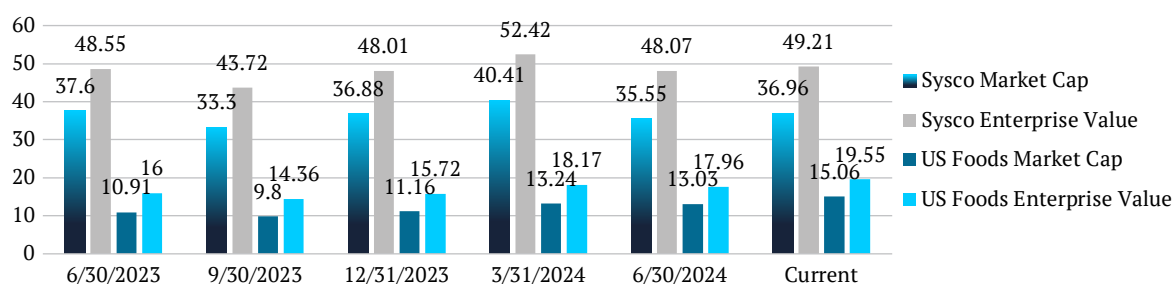


Figure 4. Market capitalization and value of Sysco and US Foods (USD billion)

Source: compiled by the author on the basis of Yahoo Finance (2024a; 2024b)

Sysco's annual revenue reaches USD 68 billion, while US Foods' figure is USD 28.1 billion. Sysco's customer base includes more than 700 000 customers and 333 distribution facilities, while US Foods has 300 000 customers and 70 distribution centres (The Top 16 Food Distributors in the USA, 2024). Sysco's success factors include high-quality service, an efficient supply chain, and a wide range of products offered to its customers. This range includes not only fresh and frozen food and beverages, but also equipment. US Foods has the advantage of offering its customers quality products under its own brand. A significant asset of the company is its high attention to environmental aspects, which is very relevant and important in today's environment.

When searching for supply channels, two options are most often focused on: direct and indirect supply (Rucabado-Palomar & Cuéllar-Padilla, 2020; Shi *et al.*, 2020). Indirect supply involves the involvement of distributors and wholesalers who can perform delivery and other tasks for a fee (Fowler, 2023). This effectively relieves producers of responsibility for the logistics process, but leads to additional costs due to the need to pay for intermediary services. Restaurants thus receive a wide range of products, but do not have sufficient control over the transparency of pricing and quality control processes. Direct supply eliminates intermediaries from the supply chain (González-Azcárate *et al.*, 2021; Paciarotti & Torregiani, 2021). Among all forms of direct marketing, the most popular is direct-to-consumer (DTC), which is used by about 77% of companies (Dorn, 2022). Direct procurement involves selling products directly to customers using online platforms (websites or mobile apps) or through stores or kiosks (Rivera *et al.*, 2020). Direct deliveries leave control over the logistics process to producers, allowing them to retain more of their profits and build better customer relationships. A relevant

advantage for restaurants is access to high-quality farm products and the ability to choose more favourable prices (Pesci & Brinkley, 2021). At the same time, direct supply is associated with certain challenges, such as high initial costs and difficulties with same-day delivery. Therefore, choosing an approach to determining the supply channel is a crucial task for both producers and restaurants (Roy & Ballantine, 2020). Modern approaches emphasize the need for a thorough analysis before making such a choice, as well as the benefits of using the latest technologies (Bumblauskas *et al.*, 2020; Liu *et al.*, 2021).

These companies and other players in the food distribution market play a critical role in the US supply chain. They facilitate the work of restaurants by providing them with a wide range of products of the right quality, and provide additional services, optimizing their costs and logistics. At the same time, cooperation with distributors can pose certain challenges, in particular, restaurants become highly dependent on their suppliers and have limited ability to control the quality of the products supplied (Shtal *et al.*, 2024). Equally relevant is the issue of paying for distributors' services, which entails additional costs for restaurants – especially if the pricing policy is not transparent enough. The latter problem is particularly acute for small businesses, which may not have sufficient funds to pay for the services of distributors. In this case, businesses are increasingly turning to an alternative supply option – direct purchases from producers. The most popular form of purchasing directly from manufacturers is DTC. This option allows shortening the supply chain by eliminating intermediaries (wholesalers and distributors) from it (Fig. 5). Accordingly, restaurants do not pay for intermediary services, which not only helps to reduce costs but also allows them to manage their pricing policy more freely.

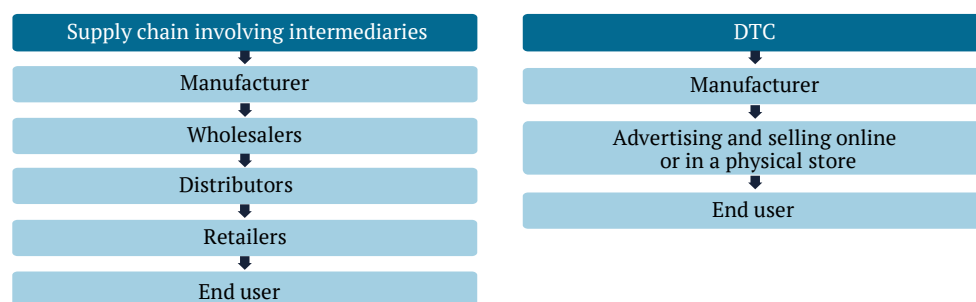


Figure 5. Differences in the intermediary and DTC supply chain

Source: compiled by the author based on data from J. Wiklund (2020)

Moreover, cooperation with producers can have a positive impact on brand building through greater quality control. The use of healthier farm products in cooking can increase the loyalty of modern consumers and meet their high demands. In order to explore the advantages and disadvantages of each of the supply options – cooperation with distributors and wholesalers or direct supply from producers – it is advisable to focus on the following aspects: analysis of producers' marketing costs and identification of challenges to implementing same-day delivery logistics; study of the role of distributors and wholesalers in the context of their impact on producers' costs; identification of the potential of direct supply for producers.

Analysis of marketing costs of manufacturers and obstacles to the implementation of same-day delivery logistics. Overall, the direct supply market is forecast to grow gradually until 2031 (Fig. 6). This can be attributed to the growing popularity of convenience foods, the increase in online shopping, and the growing number of DTC food brands. At the same time, a number of factors are hampering market growth, including lack of awareness of DTC brands, limited product range, quality issues, and delays in deliveries. The main opportunities for market growth come from sales of premium and personalized products. However, the key obstacle to market development is the high level of competition from other distribution channels (DTC Food Market by Type, 2024).

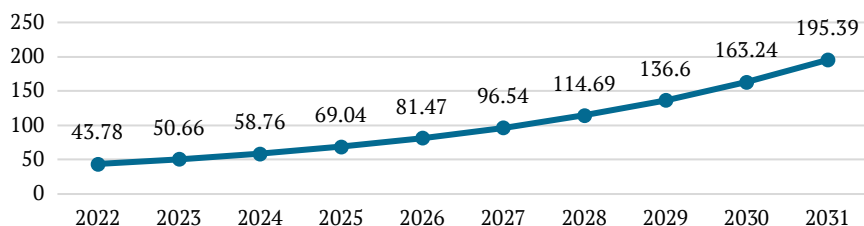


Figure 6. DTC Food Market size (USD billion)

Source: built by the author according to DTC Food Market by Type (2024)

In addition, high marketing and other costs are a significant obstacle to DTC's development. DTC appears to be more profitable than wholesale, as evidenced by the high gross margins. However, the operating margin in the case of DTC is often lower than that of wholesale. The main factors contributing to higher DTC costs are: high marketing costs – DTCs have to spend a lot on advertising to attract customers, which is not necessary in the case of wholesale channels, as stores attract their own customer base; technology costs, including technology platforms, CRM and analytics; human capital costs – DTC marketing programmes require numerous specialists to raise awareness, which also reduces operating margins (Anderson, 2022).

Speaking in more detail about marketing costs, it is impossible to ignore digital channels of promotion, as modern consumers often research products and various offers online. Today, searching on a search engine is the main way to get an online experience, preferred by more than 68% of users. Before making an online purchase, about 85% of consumers do some form of online product research. Google Ads is one of the most popular promotion tools, but more than 60% of companies in the DTC sector do not use this method. Those companies that do use Google Ads spend less than \$5,000 per month on it, while receiving less than 500,000 visitors in the relevant period. However, for 7% of

companies, marketing costs range from \$10,000 to \$50,000 per month (Naceva, 2024). This suggests that most DTCs do not fully utilize the potential of online promotion.

At the same time, even moderate investments in this area can solve a number of problems with customer acquisition and awareness. In addition, online promotion (depending on specific approaches and channels) is often cheaper than traditional advertising, which can help reduce marketing costs. Therefore, marketing costs in the case of DTCs can be high, but they solve a number of problems, including: providing new marketing opportunities and increasing gross margins, allowing for better control over sales, diversifying income and reducing risks, etc. The key barriers to the development of DTC marketing activities are lack of economic opportunities, low demand, lack of relevant knowledge and skills, lack of time, lack of labour with the required qualifications, and underdeveloped market, transport or technological infrastructure (NICRE, 2024). Along with marketing, same-day delivery costs can be a significant cost item in the DTC context. According to statistics, less than half of DTC merchants of any size offer express delivery services. Only for sellers whose size reaches more than USD 100 million (in terms of goods or services sold), this figure is 56%. The share of companies offering same-day delivery services is even lower (Fig. 7).

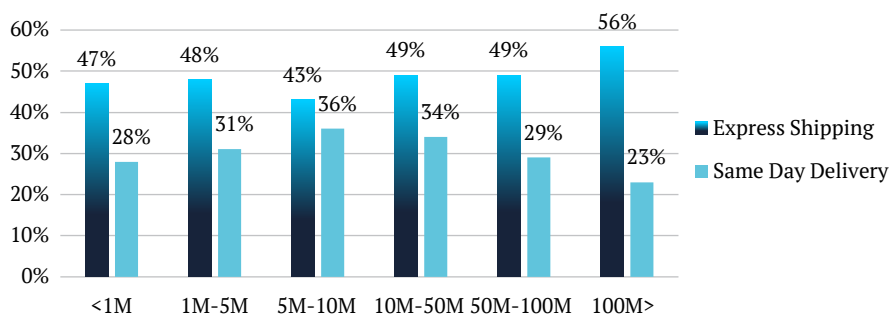


Figure 7. Percentage of companies (by volume of goods or services sold) providing express or same-day delivery services

Source: compiled by the author based on data from N. Naceva (2024)

At the same time, same-day delivery is an essential competitive advantage for DTC and one of the main expectations of modern consumers. Challenges to the effective implementation of same-day delivery include a limited number of staff (including drivers), high delivery costs, and inefficient logistics solutions. The process is becoming increasingly complicated as the distance between warehouses and customers grows, and as the need to track the movement of goods in real time increases.

The strategic use of technology is crucial to improving the overall delivery process, as well as same-day delivery. Such technologies include artificial intelligence, which allows optimizing delivery routes by identifying the most efficient and least costly ones in terms of fuel savings and reduced operating costs. Another effective technology is Geofencing, which identifies delivery zones, saving time and resources for deliveries outside these zones. In addition, significant results can be achieved by automating

dispatch processes, which allows managing the delivery schedule and assigning orders to drivers based on their location and other factors. For customers, an important option is the ability to track their orders, which increases their loyalty and reduces the workload of the customer support team (Effective Strategies for..., 2024). The use of these means of improving logistics efficiency should be guided by the principles of integrity, flexibility, and adaptability.

Study of the impact of wholesalers and distributors on producers' profits and costs. As noted above, distributors, wholesalers and other intermediaries simplify the

delivery process, but other problematic aspects accompany their involvement. On the one hand, the use of intermediaries can help reduce start-up costs and relieve the company of responsibility for certain stages of the process. On the other hand, the use of intermediary services entails additional costs, which, among other things, may increase the cost of goods for consumers. Also, indirect supply may slow down the delivery process. Therefore, producers should be careful when choosing a distribution channel, taking into account that the latter should serve as a means of increasing value for customers and meet the producer's goals. Table 1 compares direct and indirect distribution channels.

Table 1. Comparison of direct and indirect distribution channels

Comparable aspect	Direct channel	Indirect channel
Control options	The manufacturer fully controls and is responsible for delivery	Reduces control and increases dependence on intermediaries
Impact on costs and profit	Initial costs are usually higher than for an indirect channel, but may increase with efficiency and decrease over time. Higher profits can be achieved by retaining a larger share of the profit with the producer	In this case, the initial costs are usually lower, but additional costs are incurred due to intermediary fees, which vary depending on the range of services provided. Profit is shared with others (intermediaries)
Customer relations	More opportunities to build trusting and strong relationships with customers, which helps to increase their brand loyalty and receive meaningful feedback	Interaction with clients is indirect, which can lead to problems that are difficult to control if intermediaries act inappropriately
Impact on logistics	Producers are responsible for their own logistics	Logistics issues are transferred to intermediaries
Delivery time	It is usually lower due to the construction of a direct route	May be longer and depends on the third party

Source: summarized by the author according to S. Ross (2024)

Thus, with direct deliveries, producers gain more control and opportunities to build good relationships with customers, which leads to increased brand loyalty. As for costs, in the case of direct deliveries, they may be higher in the initial stages, while paying for intermediary services requires ongoing financial investments. Looking more closely at the costs associated with indirect distribution, the average margin of intermediaries in the B2B sector selling to the end consumer is between 30 and 40 per cent (Masson, 2024). However, this is only an estimate, and the percentage may vary depending on the industry, final price, sales volume, services provided by the intermediary, and other factors. In general, the distributor's markup (margin) is the percentage that characterizes the difference between the cost of goods and the selling price.

As it is known, the average profit margin for a restaurant is between 3 and 5%. At the same time, the large distributors mentioned above earn much higher profits. This may be due to a number of tactics used by distributors to increase their own profitability, including: overpricing – selling goods to restaurants at a price that is significantly higher than the market price; mismatching the quantity of goods – refers to cases when an intermediary delivers goods in quantities less than the restaurant's order without warning; replacing products with cheaper analogues; adding hidden fees; pressure from the distributor to enter into an exclusive contract, which limits restaurants from finding other suppliers, that may subsequently lead to additional forced costs; the use of various unfair marketing techniques, such as attracting the restaurant's attention with favourable offers and then urging them to buy more expensive products after signing the contract; low transparency, which makes it difficult to verify payments; encouraging

the purchase of more products than the restaurant needs, which leads to the formation of surplus products. Therefore, restaurants should be very careful when entering into agreements with intermediaries and consider their reputation. Various technological solutions can be a great advantage in this case, allowing to compare the distributor's prices with the market average, analyse contracts, store information in an orderly manner in the cloud.

Summarizing the benefits that producers gain from direct supply. It is worth summarizing the potential of direct sales for manufacturers. The main advantages of DTC encompass: greater opportunities to build trusting relationships with customers and increase their loyalty, personalization, and feedback; the ability to collect customer data, in particular, using the Google Ads tool described above (Wiklund, 2020); positive impact on brand reputation; the ability to earn higher profits, increase their share in the price of the final product; greater control over price, promotion, customer service, logistics (Feher & Macsai, 2009); possible reduction of logistics time; usually higher product quality, environmental friendliness; shorter distance to the consumer, which allows for the supply of fresh and high-quality products without preservatives; diversification of income sources and risks.

Application of Direct Trade Foundation, Sample Box Marathon and Rgand Prime Fulfilment technologies for successful direct sales. As noted, modern technologies and innovative approaches are being successfully applied to improve various aspects of direct sales. The Direct Trade Foundation, Sample Box Marathon and Rgand Prime Fulfilment allow modern manufacturers to be visible, recognizable and achieve high sales. The Direct Trade

Foundation, founded by Rovshan Rasulov, CEO of Rgand, is a programme that allows manufacturers and hospitality companies to trade directly and accelerate their development by eliminating all intermediaries. The programme includes practical experience in direct trade. In addition to investments, the Fund provides a direct access network, automated product promotion technology and logistics infrastructure that significantly reduces costs and generates more profit from each sale.

The programme offers manufacturers the opportunity to digitize and automate their marketing, sales and logistics processes with a fully automated product promotion solution. It enables manufacturers to automate sample testing to attract new direct customers without having to spend on expensive distributors, showrooms, and fairs with product reviews from restaurants and hotels that make the decision. Restaurants can try new products with each Rgand Sample Box and purchase them with one click. The programme's key offerings include direct sales training and mentoring; access to the Rgand Marketplace platform; tools to automate product promotion; reliable logistics support and order fulfilment; and investments to facilitate market entry. Samplebox Marathon is a practical implementation of training programmes. Within 90 days, the company helps manufacturers test and improves their strategies, achieving significant results in a short time. Rgand Direct-to-Buyer Marketplace allows manufacturers to manage their catalogue, orders, and transactions on a dedicated platform. Restaurant operators discover new brands from all over the world thanks to direct sales prices and promotions from manufacturers. It works like this: manufacturers send their Rgand Marketplace product range directly to Rgand fulfilment centres. When customers purchase products on Rgand.com, the company receives the order, collects, packs and ships them directly to the manufacturer's customers. Rgand Prime Fulfilment provides an integrated warehousing and same-day fulfilment solution that reduces storage and shipping costs for manufacturers. It fulfils and delivers all orders for restaurants, hotels, and cafés across the US (Rgand, 2024). The key concept of this programme is that any product must go through three main stages: visibility – the product must be visible in the market; recognition – the product must be recognizable among potential buyers; and marketability – only after achieving visibility and recognition does the product become marketable.

As a result of the study, it is advisable to summarize the opportunities provided by the use of new technologies in the restaurant business in terms of optimizing the supply process. Firstly, it is worth noting the automation of supply processes, which can be implemented through the introduction of Supply Chain Management (SCM) systems. The capabilities of such systems help to reduce delays and costs in the supply process. In addition, restaurants can use inventory management software. This allows for real-time updates on available inventory and reminders to order products that are running low in time. Another easy-to-implement and effective solution is to use online platforms that allow placing orders with suppliers in a convenient format. The advantage of this approach is the convenience of electronic payments, as well as the ability to choose

local suppliers, which will minimize the transportation route and ensure the freshness of the products. Data analytics is a useful tool for analysing and forecasting demand and analysing feedback. In this way, a restaurant can significantly improve its supply planning in line with current market requirements. Another useful technology in terms of achieving a high level of product quality is the Internet of Things. This method uses special devices to assess the condition of ordered goods as they move along the supply chain. As for other new technologies that enable effective product tracking, it is worth highlighting the use of QR codes. This technology makes it possible to determine the origin of goods, which, among other things, ensures greater transparency of supply. For restaurants that have sufficient funds at their disposal, the use of equipment that integrates with software, such as an inventory management system, as well as equipment with smart sensors (temperature, etc.), can be a useful tool. Thus, the introduction of these technologies into a restaurant's operations not only optimizes the supply process, but also improves customer service by ensuring the availability and high quality of food.

■ DISCUSSION

This study confirms the significant impact of large distributors and wholesalers on the food market. On the one hand, these business entities simplify the supply process for producers and restaurants, but cooperation with them is accompanied by a number of disadvantages. One of the most significant is the increase in costs caused by intermediary fees. At the same time, direct supply opens up wider opportunities for restaurants and producers: for the former, it means increased independence in choosing prices and products, improved transparency, access to fresh farm products, and higher quality control. For producers, it means retaining a larger share of profits and reducing costs associated with paying for services, better customer relations, and brand development (Teta & Xhafka, 2023). However, the use of direct sales also has a downside and is accompanied by problems with same-day delivery and high marketing costs. The study proposes an approach aimed at mitigating such problems through the use of Direct Trade Foundation, Sample Box Marathon and Rgand Prime Fulfilment technologies, which allow manufacturers to be visible, recognizable and achieve high sales. This approach offers producers a wide range of opportunities through mentoring, access to a specialized e-platform and automation tools, as well as reliable logistics and investment support.

The conclusions of the study are consistent with the results of other authors on the importance of developing direct sales in modern economic conditions. A. Bolo (2020) noted the growing importance of direct sales in Guadeloupe in the context of the COVID-19 pandemic. The scientist found that in the context of the pandemic, when restaurants and other food establishments were closed, farmers began to adapt to the situation through the use of direct sales. In the future, according to the scientist, this trend should be maintained by preserving the initiatives launched during the quarantine period. This can be done by raising awareness of agroecological approaches, informing about the benefits and quality of farm food, and promoting local production through the implementation of

appropriate policy decisions (Shahini *et al.*, 2023). According to the study by A. McLeod & J.M. Halstead (2020), it can be summarised that the purchase of products directly from farmers by restaurants increases their competitive advantage. The researchers found that modern consumers do not always want to buy their own food from farmers, but still want to consume high-quality and environmentally friendly food. In this case, restaurants can strengthen their brand and increase customer loyalty through direct cooperation with farmers. At the same time, researchers in New Hampshire have found that restaurants offering less than 750 meals per week and establishments that have been making food-purchasing decisions for more than two years do not show a tendency to buy local products. Scientists see the solution to the lack of popularity of direct purchases of local food in raising awareness of the importance of knowing where the food comes from and what quality it is.

Meanwhile, in the above-mentioned studies, researchers did not note the potential of using new technologies to increase the demand for purchases directly from farmers. In the author's work, this approach is identified as a priority, which is supported by the findings of other researchers. For example, E. Horská *et al.* (2020) investigated the factors influencing the sale of local farm products in Slovakia. The researchers found that farmers seek to optimize their supply chains by selling their products via the shortest possible routes. The most commonly used sales tools are on-farm sales and telephone orders. Scientists have noted that in this way, farmers may miss out on certain benefits that are revealed by other tools, such as farmers' markets or e-commerce. S. McKee *et al.* (2023) and N.L. Kim *et al.* (2021) also noted the benefits of selling directly to consumers through electronic channels, exploring the determinants of consumer attitudes towards direct sales and factors influencing the decision to repeat a purchase.

A number of works emphasize that both direct and indirect sales have their advantages and disadvantages, so the choice of a particular channel (or a combination of several) depends on the specific situation. The results of the work of S. Azima & P. Mundler (2022) prove that both the choice of a channel involving intermediaries and direct supply have their own strengths. The researchers studied the potential social and economic benefits that farmers receive through the use of short food supply chains in Canada. For example, the involvement of intermediaries reduces the workload of farmers, as it frees them from the obligation to handle marketing and logistics tasks themselves. At the same time, direct sales allow for better control over these processes, although they may have lower profitability due to high logistics and marketing costs (Galkin *et al.*, 2019), which was also emphasized in the author's work with some ways to solve the problems. X. Pu *et al.* (2020) studied different strategies for distributing their products by manufacturers – direct sales, reselling (selling products by the manufacturer through an online store) and agency sales. The authors showed that, given the low transaction costs (compared to online sales and agent commissions), direct sales are the optimal channel for a manufacturer. Accordingly, selling through an online store is the preferred option, provided that the online channel has low operating costs. Agent sales can be chosen in case of low commission fees

(Sinoimeri *et al.*, 2024). At the same time, the conclusions of the author's work somewhat differ from these results. In the author's study, cost reduction is not the only criterion for choosing a supply channel, as the quality of services provided by intermediaries, the ability to build relationships with customers, increase brand awareness, etc. also play an important role for manufacturers. Therefore, a multi-criteria approach is advisable before making a decision on the choice of a supply channel.

Some studies give preference to wholesale sales. In contrast to the author's study, B. Lee *et al.* (2020) concluded that wholesale is a more profitable option for farms in Taiwan. The researchers focus on the link between farm profitability and the choice of marketing channels, while noting that the government supports direct sales as the demand for safe food is growing. One might agree with these conclusions if one takes into account the choice of marketing channel only for reasons of increasing sales. However, the approach proposed in the author's article allows ensuring high sales volumes even if direct supply channels are chosen, which is possible with the use of the technologies described in this paper. In addition, it is difficult to achieve a long-term positive effect for manufacturers based on sales volume alone, since their development depends on other factors, including increasing customer loyalty, brand building, quality of services, etc. (Artyukh *et al.*, 2023)

A comparison of the author's research with other works has revealed both common and distinctive features in the conclusions drawn. This may be due to the fact that the impact of the advantages and disadvantages of direct and indirect supply significantly depends on the context, industry, implementation approaches, etc. However, the author is inclined to argue that it is in the restaurant business industry that direct sales can have the great advantages described in the paper. Moreover, the innovative approach proposed in the paper regarding the use of Direct Trade Foundation, Sample Box Marathon and Rgand Prime Fulfilment technologies can be a significant step forward in terms of its complexity and ensuring the implementation of the concept of "being visible, recognizable and achieving high sales".

■ CONCLUSIONS

Direct supply offers a number of benefits for restaurants, producers, and consumers. First and foremost, it offers opportunities for these supply chain participants by cutting out intermediaries – cost savings, better control over the distribution process, positive brand exposure and improved product and service quality. This paper outlines the role of large distributors and wholesalers in the supply chain of the US restaurant industry. These intermediaries play a pivotal role by simplifying the distribution process for restaurants and manufacturers, but their involvement is associated with several challenges. One of the main problems is the increase in the cost of paying for intermediary services, especially in the case of non-transparent pricing and insufficient control over product quality. On the other hand, direct supply offers significant potential for producers and restaurants, which is reflected in the development of customer relationships, brand strengthening, better control over marketing and logistics, and the ability to retain a larger share of profits.

In turn, direct deliveries are not without their drawbacks. The paper notes the high marketing costs associated with direct deliveries, as well as the problems that arise when implementing same-day delivery. High marketing costs are driven by the need to pay for advertising, the cost of using technology platforms, CRM and analytics, and labour costs. Barriers to the development of same-day delivery include a shortage of staff (drivers), high delivery costs, and inefficient logistics solutions. Additional problems are caused by the considerable distance from warehouses to customers and the need to track goods in real-time. The paper proposes solutions to these problems based on the use of modern technologies. In particular, a positive contribution is expected from the use of digital promotion channels and the strategic use of technologies in general, such as artificial intelligence, geofencing, and automation.

The study focused on the use of Direct Trade Foundation, Sample Box Marathon and Rgand Prime Fulfilment technologies for successful direct sales. These technologies allow the implementation of the concept of “being visible, recognizable and achieving high sales”. The practical application of the proposed approach can provide farmers with comprehensive support – from mentoring to providing technological solutions for direct sales. Further research could focus on a more detailed study of ways to

reduce producers’ marketing costs using new technologies and suggest the most effective online promotion strategies. In addition, future research could explore the integration of blockchain technology and advanced logistics management tools, such as artificial intelligence and IoT, to further enhance the transparency and efficiency of direct supply chains. Developing sustainable strategies for reducing delivery costs and overcoming logistical challenges, especially related to same-day delivery, will be crucial in optimizing direct supply methods. Producers and restaurants stand to benefit from implementing these advanced technologies, as they offer more streamlined processes, lower operational costs, and better adaptability to market demands. The broader application of these findings in international markets should also be studied to assess the generalizability of these solutions beyond the U.S. Limitations of the study include the fact that it focused exclusively on the US market, so the conclusions may differ slightly in other regions of the world.

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■ CONFLICT OF INTEREST

None.

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Оптимізація прямих ланцюгів постачання в ресторанному бізнесі: Вирішення ключових проблем за допомогою технологічних інновацій

■ **Анотація.** Це дослідження мало на меті вивчити потенціал різних каналів постачання в ресторанній індустрії, з акцентом на оптимізацію прямого постачання з використанням передових технологій. Застосовуючи економічні та статистичні методи, в дослідженні проаналізовано роль великих дистриб'юторів та оптових торговців у ланцюгу постачання продуктів харчування в Сполучених Штатах. Хоча ці учасники ланцюга поставок підтримують діяльність ресторанів і виробників, вони також можуть збільшувати витрати, знижувати маркетинговий і логістичний контроль і перешкоджати розвитку відносин з клієнтами. Прямі поставки мають значні переваги, такі як підвищення лояльності до бренду, збільшення прибутку та доступ до високоякісних продуктів. Однак його зростання стримується такими проблемами, як високі маркетингові витрати та впровадження доставки в той самий день. Ці витрати включають інвестиції в рекламу, технологічні платформи, CRM-системи та оплату праці персоналу. Основними перешкодами для доставки в день замовлення є нестача персоналу (особливо водіїв), висока вартість доставки та неефективна логістика. Дослідження припускає, що технологічні рішення, включаючи розвиток мереж прямого доступу, автоматизованих інструментів просування та логістичної інфраструктури, можуть допомогти пом'якшити ці проблеми. Платформи Sample Box Marathon та Rgand Prime Fulfilment проаналізовані як практичні рішення, що зменшують витрати та підвищують прибутковість. Результати цього дослідження можуть стати цінною інформацією для виробників і ресторанів, які прагнуть оптимізувати свої ланцюги поставок.

■ **Ключові слова:** дистриб'ютори; оптовики; доставка в день замовлення; технології; лояльність клієнтів; розвиток бренду