

Pain Points and Optimization Paths of the Last-Mile Supply Chain under the Community Group-Buying Model: A Case Study of Meituan Select

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Abstract. Driven by the growth of Internet retail and local life services, community group buying has emerged as a new retail format that distributes fresh produce and daily consumer goods in residential communities through a model of online pre-sales, centralized platform procurement, and next-day pickup. Taking Meituan Select as a case study, this paper examines the last-mile supply chain of the community group-buying model, and analyzes pain points in its last-mile fulfillment system from the dimensions of grid warehouse operation and logistics coordination. The core bottlenecks of Meituan Select's last-mile supply chain include low manual sorting efficiency, unstable coordination between line-haul transportation and last-mile delivery, insufficient cold-chain protection for fresh products, weak governance over grid warehouses and community group leaders, and limited end-to-end information synergy. These problems mainly stem from the mismatch between rapid business expansion and infrastructure construction, increased management difficulty caused by dispersed last-mile nodes, and insufficient investment in digital and intelligent facilities. To address these issues, this paper puts forward four optimization proposals: promoting the standardization and digital upgrading of grid warehouses, strengthening coordination between line-haul and last-mile operations, improving the cold-chain fulfillment system for fresh products, and optimizing the governance mechanism for franchisees and community group leaders.

Keywords: Community group buying, Meituan Select, Last-mile supply chain, Grid warehouse, Fresh-food cold chain

1. Introduction

Xu and Yang believe that community group purchase of agricultural products can reduce the distribution path by aggregating demand and reorganising the supply chain; however, there are many problems in the development of this system, such as poor quality control of products, issues with community group leaders, and supply chain instability [1]. Qi and others believe that for the long-term development of community group buying, the competition will shift from price subsidies to competitiveness in product quality, logistics efficiency and service capabilities, and coordination among platforms, suppliers, community group leaders and consumers needs to be strengthened [2].

Wang proposes that, for joint distribution, fresh food community group buying can reduce last-mile delivery costs by combining warehousing and distribution resources, optimising delivery routes, and improving vehicle utilisation [3]. Chen took Meituan Select as the research object to explore the marketing strategies for fresh agricultural products under the community group buying model, and pointed out that although pre-sale centralised procurement and community channels should be fully used, the platform also needs to strengthen mechanisms for product quality control, logistics distribution and after-sales service [4].

Although previous studies have provided a foundation for understanding the operating features of community group buying, there is still a lack of systematic research on last-mile supply chain problems, such as grid warehouse sorting, line-haul and last-mile coordination, cold chain guarantees, and management of community group leader pickup points. Based on this, this paper will outline the structure and working process of Meituan Select's last-mile distribution network, identify its main problems and the reasons behind them, and put forward targeted optimisation directions for grid warehouse standardisation, line-haul and last-mile coordination, cold chain system construction, partner node governance, and digital information sharing.

2. Analysis of relevant theories and Meituan Select's last-mile supply chain system

2.1. Core concepts and fundamental theories

Community group buying is a retail model that mainly serves the residents of a community, uses an Internet platform as the transaction channel, takes community group leaders or community stores as product delivery points, and organises centralised procurement and unified distribution according to consumers' advance orders. It has a pre-sale mode, is region-limited, centrally procured, and supports community pick-up points [5].

The last-mile delivery stage is the final step in delivering goods to the end-users from a distribution centre. In community group buying, the following will also be included: transportation from grid warehouses to pickup points, goods reception, temporary storage, sorting, verification, loading, handover, safekeeping and after-sales service. A grid warehouse serves as a distribution centre for the central warehouse, connects with community group leader pickup points, and handles the secondary sorting and delivery of orders for several pickup points in an area [6].

Supply chain coordination theory believes that all links in the chain of procurement, warehousing, transportation, distribution and sales need to improve the overall efficiency of the supply chain by strengthening information sharing, process coordination, resource integration and aligning interests.

2.2. Comparison of mainstream last-mile supply chain models in the community group-buying industry

Meituan Select and Duo Duo Grocery both use pre-sale centralised procurement and next-day pickup as their main fulfillment models, and both have warehousing and distribution networks with nodes such as central warehouses, grid warehouses, and community pickup points. Meituan Select generally organises the last-mile delivery by using local-service resources, regional delivery capabilities and a network of community group leaders; Duo Duo Grocery, on the other hand, is more dependent on its e-commerce user base, agricultural-product supply chain and partner stores to extend business coverage [7]. Table 1 shows the last-mile supply chain models of Meituan Select and Duo Duo Grocery based on the above indicators.

Table 1. Comparison of the last-mile supply chain models of Meituan Select and duo duo grocery

Comparison Dimension	Meituan Select	Duo Duo Grocery
Warehousing and Distribution Structure	Central warehouse, grid warehouse, and community group leader pickup points	Central warehouse, grid warehouse, and store pickup points
Distribution Method	Centralized distribution by the central warehouse and secondary sorting at grid warehouses	Goods consolidation at the central warehouse, followed by sorting and delivery by regional grid warehouses
Types of Pickup Points	Community group leaders, convenience stores, and community stores	Mom-and-pop stores, convenience stores, and other partner stores
Fulfillment Method	Online pre-sale, next-day delivery, and community pickup	Online pre-sale, next-day delivery, and store pickup
Expansion Characteristics	Market expansion based on local-service resources and partner nodes	Market expansion based on e-commerce traffic, agricultural-product supply chains, and partner stores
Last-Mile Advantages	A relatively strong regional delivery foundation and strong coordination with community group leaders	A large user base and strong capability in organizing low-priced products
Major Shortcomings	Considerable difficulty in managing grid warehouses and community group leaders, with regional differences in fulfillment quality	Inconsistent service standards across pickup points and substantial pressure in fresh-product storage and after-sales coordination

2.3. Overall supply chain architecture of Meituan Select

The front-end supply chain will organise the product and, based on the planning category, select a supplier for quality inspection.

The central warehouse is a key link in the midstream supply chain that receives goods from suppliers, carries out quality inspection, stores them in a temperature-zone-based area, processes orders, consolidates goods, and distributes them to various regions. After the above operations, the line-haul vehicles will transport the goods to the relevant grid warehouses [8].

Grid warehouses receive goods in bulk from central warehouses, and according to the orders of different pickup points, perform complete unloading, temporary storage, secondary sorting, verification, loading, and route-based delivery. Community group leaders are responsible for receiving the goods, temporarily storing them, notifying of pickup, and reporting any abnormal circumstances such as out-of-stock items, incorrect items, damage, returns and exchanges [9].

3. Analysis of the core pain points in Meituan Select's existing last-mile supply chain

3.1. Limitations in manual operating efficiency at grid warehouses

Some partner grid warehouses are still manually operated for unloading, handling, identification, sorting and verification due to constraints on site size, operating returns and equipment-investment capacity. According to a 2025 industry survey by Orient Securities Research Institute, community group-buying grid warehouses generally have an area of 500-1,500 square meters, a daily outbound volume of about 5,000-10,000 items, and can reach 20,000-50,000 items during promotions; the manual sorting efficiency is around 250-400 items per person per hour. When the volume of orders rises rapidly in a short period, staffing levels and worker proficiency cannot adapt to the changes in operating demands promptly; as a result, there is a backlog of goods, delayed vehicle departures, and an increase in sorting errors [10].

3.2. Imbalance in coordination between line-haul transportation and last-mile delivery

If the supplier delivers late, acceptance at the central warehouse will be delayed; if the line-haul vehicles arrive late, subsequent staffing arrangements, sorting progress and delivery routes for grid warehouses will all be affected. Based on the industry survey, a single central warehouse usually needs to be connected with dozens of grid warehouses, and one grid warehouse can cover several hundred community group leader pick-up points. Data released by the Wuhan Municipal Administration for Market Regulation show that 2,095 community group-buying complaints and reports were received in the area in 2020. The problems that consumers have reported mainly include late delivery of goods, poor product quality and slow after-sales service [11].

3.3. Cold-chain breaks and high loss rates

Some of the partner grid warehouses have been converted from general-purpose warehouses and do not have sufficient refrigerated areas, freezers or temperature-monitoring devices. In 2024, the circulation loss rate of fresh agricultural products in China was about 12%, and the cold chain transportation rates for fruits and vegetables, meat and aquatic products were around 35%, 57% and 69% respectively. It can be seen that the new products are still subject to the risks of temperature fluctuations and losses during storage and transportation [12].

If some routes use ordinary vehicles with insulated boxes or ice packs, the goods may be repeatedly exposed to a non-low-temperature environment during unloading, sorting and waiting for loading, and thus are prone to cold-chain breaks.

4. Analysis of the causes of problems in Meituan Select's last-mile supply chain

4.1. Mismatch between rapid business expansion and infrastructure development

Warehouse site selection, equipment arrangement, staff training, transport routes and information systems all require long-term development and adjustment, and too rapid business expansion will cause infrastructure capacity to lag behind the speed of order growth [13]. Due to the lack of dynamic matching between infrastructure configuration and market demand, some areas will continue to be over- or under-utilised for an extended period [14].

4.2. Increased management complexity caused by dispersed last-mile nodes

Community group buying needs to be near residential areas, so there are many widely distributed and geographically dispersed grid warehouses and community group leader pickup points. Different areas have different scales of consumption, traffic conditions, operating bases and personnel quality, so a uniform system cannot be fully implemented at all nodes [15]. A grid warehouse generally has to manage several dozen or more pickup points, and the orders, delivery times and receiving conditions for each pickup point are not the same.

4.3. Insufficient investment in digital and intelligent infrastructure

Community group buying focuses on a low price and cost-effectiveness, and the logistics expenses that can be covered by each last-mile order are relatively small. Grid-warehouse operators generally lack the incentive for large-scale investment in automated sorting equipment, intelligent handling tools and cold chain facilities. If the supplier, warehouse, carrier and community group leader cannot enter the data accurately and promptly, even the best system will fail to reflect the actual situation.

5. Tiered optimization paths for Meituan Select's last-mile supply chain

5.1. Standardization and digital upgrade plan for grid warehouses

Meituan Select should carry out tiered construction and differentiated renovation of grid warehouses according to the regional order volume, the number of community group pickup points and delivery radius, and formulate unified standards for site selection, site layout, staffing, equipment use and operating process. Large-scale grid warehouses can be equipped with automatic conveyor systems, electronic labels, intelligent weighing equipment and assisted sorting devices, and small- and medium-sized grid warehouses can use barcode-scanning sorting, visualised storage locations and mobile verification terminals.

Given the limited funds for small and medium-sized grid warehouses, digital-equipment service providers can offer a lightweight solution of equipment leasing, pay-per-use arrangements and shared systems to reduce initial renovation costs.

5.2. Strengthening coordination between line-haul and last-mile operations

When the central warehouse plans to dispatch vehicles, it should consider the load factor of the vehicles, the grid-warehouse sorting capacity, route length and the receiving time of community group leaders. In areas with a high order density, multiple transportation runs and staggered arrivals at the warehouse can be used to reduce the pressure of concentrated sorting, and reasonable transportation time should be allocated for county-level areas and townships with difficult-to-transport conditions.

During the holidays, promotional periods and bad weather, the platform can sign flexible-capacity agreements with third-party logistics enterprises to have these third parties provide temporary vehicles, backup drivers and emergency routes to avoid delivery interruptions due to a large number of orders.

5.3. Improving the end-to-end cold-chain fulfillment system for fresh products

Central warehouses, line-haul vehicles, grid warehouses and pickup points should be equipped with refrigerated and frozen facilities according to the volume of orders, and the time goods are kept at ambient temperature must be strictly limited. A temperature sensor or an electronic temperature tag can be attached to a temperature-sensitive product, such as meat, dairy products and frozen food, and continuous data will be recorded during transport, sorting and temporary storage.

Areas with a high order density are suitable for fixed cold-chain facilities and dedicated vehicles; otherwise, third-party joint distribution can be used to reduce the empty-running rate of cold-chain vehicles in areas with a small order volume or long distances.

6. Conclusion

Meituan Select has built a large-scale distribution network based on the three-tier nodes of central warehouses, grid warehouses and community group leader pickup points. The problems in the last-mile supply chain are quite serious: low manual sorting efficiency at grid warehouses, unstable coordination between line-haul transportation and last-mile delivery, frequent cold chain breaks and high loss rates for fresh products, insufficient governance over franchisees and community group leaders, and fragmented end-to-end information flow. These problems cannot be traced back to a single link; rather, they are the result of the combined effect of rapid business development, outdated infrastructure, management deficiencies, weak digital capabilities and cost control goals.

Due to the lack of public data and research conditions, this paper could not obtain operational data for Meituan Select's grid warehouses in different areas, nor conduct field research on regional fulfillment differences; therefore, some of the analysis is based on qualitative judgment.

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