NO PREP

Supply Chains Under Stress

Turkeys, Trucking, and Cold Storage

Includes: Student reading, case study, differentiated questions, teacher key

Name: Period: Date:

Supply Chains Under Stress: Turkeys, Trucking, and Cold Storage

Why One Holiday Date Strains a National Food Network

Thanksgiving concentrates demand for specific foods—turkeys, cranberries, pumpkin, potatoes, pie crusts, and dairy—into a tiny window. Suppliers must time production, processing, storage, and transport so millions of households can shop within the same ten days. Even small hiccups—a late frost reducing cranberry yields, a labor shortage at a distribution center, a snowstorm closing interstates—can ripple through the network.

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Turkeys: Frozen vs. Fresh and the Role of the Cold Chain

Most holiday turkeys are raised months in advance. Many are flash-frozen and stored in deep freeze to smooth production across the year, then released to retailers in the weeks before the holiday. "Fresh" turkeys (never frozen) compress the timeline: they leave plants within days of arrival at the store, with strict temperature and shelf-life constraints. That means the cold chain (from plant blast chillers to refrigerated trailers and in-store coolers) must work without interruption. A breakdown at any stage risks food safety, quality loss, and waste. To hedge, retailers may split orders among regions (Upper Midwest vs. Southeast plants), book redundant carriers, and stage drop trailers at busy stores for quick

swaps. Yet any last-minute promotion can yank demand above forecast, emptying endcaps and forcing emergency deliveries. Consumers feel the system when the "right size" bird disappears; suppliers feel it as capacity hits the red line.

Cranberries, Pie, and the "Right-Now" Problem

Cranberry processors build inventory in October, but jellied sauce, fresh berries, and dried fruit move through different channels. Canned goods can ride rail to distribution centers early; fresh berries and cream for pies depend on tighter windows and refrigerated trucks. Bakeries time pie shells and pumpkin fillings to arrive just-in-time so shelves aren't clogged two weeks too early. That leanness reduces storage costs but raises vulnerability: a missed truck appointment can mean empty shelves for a whole day of peak shopping. Retailers offset with cross-docking (rapid transfer from inbound to outbound without long storage) and pull-forward plans (releasing a little stock earlier if storms loom). Geography adds spice: an icy pass on I-80, a river barge delay, or a regional driver shortage can skew availability by state. The public sees "sold out"; logisticians see a chess board where each piece (trailer, dock door, pallet slot) must align exactly once.

Bottlenecks, Black Friday, and Measuring Risk

Thanksgiving stress doesn't end at dinner. Black Friday creates a second surge: sandwich fixings, to-go containers, seltzers, and snack trays drain remaining capacity while carriers and store teams pivot to holiday retail. Smart operators map bottlenecks—the single points that can throttle flow: limited dock doors, short driver rosters, constrained freezer space, or a store's backroom too small for an extra pallet of turkeys. They run what-if drills: If storm X hits, release buffer inventory Y from DC Z; if a carrier misses, swing to brokered loads; if freezers are tight, prioritize items with the shortest shelf life. On the classroom side, students can treat a Thanksgiving basket as a systems problem: chart origin regions, storage state (frozen/fresh/ambient), required temperatures, and last-mile risks—then ask where a small investment (extra freezer capacity, a backup carrier contract) would cut the most risk per dollar.

Key Information: Quick Guide: Thanksgiving Cold Chain Risk Points

Segment	Typical Risk	What Mitigates It	What Students Should Watch
Farm → Plant	Weather shocks, flock disease, harvest delays	Diversified farms/regions; health protocols	Seasonal timing vs. demand week
Plant → DC	Trailer shortages; equipment failure	Redundant carriers; maintenance; buffer inventory	Temperature logs; transit time
DC → Store	Dock congestion; labor gaps; storms	Cross-docking, staggered appointments, backup routes	Lead times; safety stock levels
Store Backroom	Limited freezer space; mis-rotation	Early allocation; clear FIFO processes	Shelf checks; date coding
Consumer Purchase	Panic buying; last-minute size shifts	Smart promotions; limit policies; real-time replens	Price tags; out-of-stock signs

Case Study Excerpt — "One Snowstorm, Two Birds: A Thanksgiving Logistics Pivot"

Five days before Thanksgiving, a lake-effect snowstorm closes an interstate outside Buffalo. A retailer has two turkey streams inbound: frozen birds by rail + truck from the Upper Midwest and "fresh" turkeys on reefers (refrigerated trailers) from a plant in Pennsylvania. By Monday morning, the DC is stacked with canned cranberry and boxed stuffing, but the fresh turkeys—planned for a tight Tuesday-Wednesday window—are stuck behind road closures. The logistics team convenes a 9 a.m. call. Option A: wait and hope plows reopen lanes in time. Option B: re-route reefers south along open toll roads—longer distance, higher cost, but safer ETA. Option C: pull forward extra frozen turkeys and switch store ads to "limited-time frozen deal," paired with signage explaining safe thaw times. They choose B and C together. One broker secures two extra carriers; the merchandising team triggers digital price tags for frozen birds; the DC reallocates dock doors to speed the swap. By Wednesday, stores have mixed displays: smaller stacks of fresh turkeys and a beefed-up frozen endcap with a thawing guide. Shoppers still find a bird within their target weight. The company's post-mortem shows the win wasn't perfect forecasting; it was optionality—having buffer inventory, pre-negotiated routes, and the ability to change the plan in hours. The lesson for students: resilient systems aren't rigidly efficient; they're slightly slack, with multiple ways to hit the goal when one path fails.

1. In the case study, name two specific decisions that increased resilience and explain why each worked under time pressure.

2. Explain how buffer inventory can reduce out-of-stocks during a storm while still controlling costs most of the year.

Multiple Choice

1. The cold chain is essential for turkeys and dairy because it:

    a) Eliminates the need for warehouses

    b) Guarantees lower prices for consumers regardless of distance or any disruption

    c) Replaces demand forecasting entirely

    d) Maintains safe temperatures from plant to store to protect quality and safety

2. Cross-docking at a distribution center is best described as:

    a) A pricing and promotional strategy for holiday sales and discounting at the DC

    b) Rapidly transferring freight from inbound to outbound with minimal storage time

    c) Shipping everything directly from farm to store with no DC

    d) Holding product for weeks to build safety stock

3. Retailers build buffer inventory before Thanksgiving primarily to:

    a) Keep competitors from buying up the available supply before the holiday rush even begins

    b) Avoid hiring seasonal staff

    c) Reduce the need for refrigeration

    d) Absorb shocks from weather, transport, or labor disruptions in a fixed, high-demand week

Matching

Write the letter of the correct definition on the line next to each term.

Term	Definition
1. ___ Cold chain	A) Measure of how quickly supply can expand when demand rises
2. ___ Cross-docking	B) Single point that limits overall system throughput
3. ___ Buffer inventory	C) Temperature-controlled handling from plant to shelf
4. ___ Elasticity of supply	D) Extra stock staged in advance of a demand spike
5. ___ Bottleneck	E) Rapid DC transfer from inbound to outbound with little/no storage

Fill-in-the-Blank

1. "Fresh" turkeys compress the time window for delivery because they cannot be safely _____ for long periods.

2. A DC facing storm delays might _____ forward frozen stock and adjust promotions to protect in-store availability.

3. A system with _____—multiple routes, carriers, or suppliers—can recover faster when a lane closes.

Short Answer

Answer each question in 2-4 complete sentences.

1. Your store expects a storm two days before Thanksgiving. Propose two actions (one transport, one in-store) to keep turkey availability stable.

_____

_____

_____

2. Describe one trade-off between efficiency and resilience in holiday supply chains, and give a concrete example from Thanksgiving foods.

3. If you had $1 to spend per household on risk reduction, where would you invest it (freezer space, backup carriers, earlier canned deliveries, etc.) and why?