



Farm to fork

Helping the Canadian food and beverage industry solve the traceability challenge



Introduction

MNP is a leading provider of advisory services and technology solutions to Canada's food and beverage industry. As we engage with our clients in this sector, we find traceability is increasingly top of mind for processors and manufacturers.

Traceability and supply chain resiliency during the COVID-19 pandemic

The difference between success and failure often hinges on resilient supply chains that can react quickly and execute decisively.

Companies have needed to:

- Quickly switch or add suppliers to respond to demand surges and supply disruptions;
- Rapidly determine available inventories across multiple supply chains and partners;
- Share quality assurance, inspection and certification data faster than ever before;
- Negotiate / execute transactions and provide flexible financing in a fluid business environment;
- Increase transparency across all aspects of their supply chain, including sourcing, processing and delivery of ingredients as well as final products.

Organizations which have robust traceability solutions have been much more adaptable than those that do not. Most food and beverage business now realize it's necessary to invest in mitigating supply chain risk.

The following roadmap will help you understand traceability — both how it applies to your business and how it can support a stronger, more resilient supply chain. It also describes how MNP can help your business rapidly select and implement the right traceability solution to maximize the effectiveness of your risk mitigation investments.

What is traceability?

The Canadian Food Inspection Agency (CFIA) defines traceability as: The ability to track the movement of a food or a food commodity, one step back and one step forward.

The Institute of Food Technologist's Global Food Traceability Center similarly says: Food traceability is the ability to track a given food or ingredient from its point of production (e.g. farm, abattoir, harvest at sea) through processing, manufacturing, and transportation to retail and sale to consumer. [It is] the ability to track the forward movement of a product through specified stage(s) of the extended supply chain and trace backward the history, application, or location of that product.

Food Standards Australia New Zealand (FSANZ) adds a little more detail: Traceability is the ability to track any food through all stages of production, processing and distribution (including importation and at retail).

Traceability should mean that movements can be traced one step backwards and one step forward at any point in the supply chain. For food processing businesses, traceability should extend to being able to identify the source of all food inputs such as:

- Raw materials
- Additives
- Other ingredients
- Packaging

Why is traceability important?

The ability to trace the movement of food items through the supply chain is critical from a safety perspective. It allows for corrective actions such as quick and effective product recalls. Canadian food safety regulations related to traceability are becoming ever more rigorous — and food and beverage processors must be prepared to meet current and emerging regulatory requirements.

Traceability is a regulatory requirement and the penalties for non-compliance are severe.

Canadian Food and Beverage processors must comply with new Safe Food for Canadians Regulations (SFCR) for safety and traceability which became effective January 15, 2019.

The SFCR traceability regulations apply to all food businesses with gross sales of over \$100,000 and the risks of non-compliance can be severe. Food businesses are required to have a Safe Food for Canadians license and if found in non-compliance can be shut down until they come into compliance. 15 Canadian food companies have had licenses suspended in 2020 and have had to shut down operations until CFIA deems them to be in compliance. This White Paper provides a primer on understanding regulatory requirements and a road map for implementing effective traceability solutions that enable compliance with SFCR.

Traceability has also been significant during the Covid-19 pandemic.

The importance of traceability during the COVID-19 Pandemic

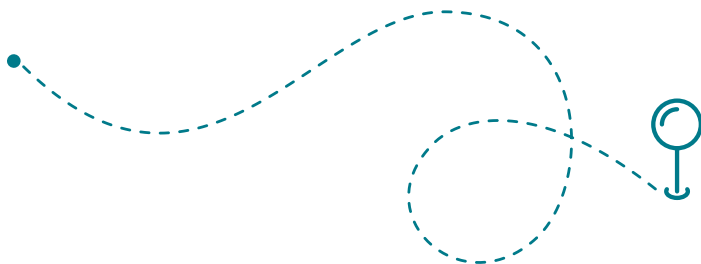
The Harvard Business Review (HBR) noted in March 2020 that mapping supply networks supported better preparedness for COVID-19. Decision makers were able to analyze risks throughout their supply chain within minutes and quickly secure alternate supplies.

HBR also noted in April 2020 the importance of emergency supply chain financing for keeping manufacturing suppliers afloat. This has supported everything from accelerated invoice payments, to advance purchases, and loans to key suppliers — including those two or three tiers down in the supply chain. Without reliable traceability, supply chain management is impossible in times of crisis.

Consider the example of a major cooperatively owned North American natural and organic products wholesaler. This organization used a leading traceability platform to rapidly adjust product and ingredient sourcing to respond to supplier disruptions in COVID-19 hotspots.

Traceability also has many other benefits beyond food safety, including:

- Improving operational and supply chain efficiency;
- Reducing loss and waste;
- Enhancing transparency and consumer trust;
- Increasing market differentiation;
- Mitigating food fraud;
- Enabling sustainability initiatives (e.g. monitoring carbon footprint, verifying legal provenance);
- Providing record of production practices and other mechanisms to combat human rights violations





From cost centre to profit centre

The crux of the traceability issue from a processor perspective has historically been the cost of implementation versus the lack of clarity around a corresponding financial upside. But the dynamics are continually shifting toward traceability as a potential source of revenue and profit.

Processors who implement traceability effectively are increasingly able to differentiate their products in the marketplace, gain market share and obtain premium pricing. This is a game changer and makes investment in traceability solutions a competitive advantage.

The Cargill traceable turkey program

Cargill, the largest agricultural commodities supplier in the world, rolled out a traceable turkey program across 30 states over the 2018 holiday season for its Honeysuckle White brand.

The traceable birds all had codes on their packaging which a shopper could enter in a text message or on the company's website to immediately find the location of the farm, the name of the farmer or family, images and any other information the producer wanted to share. In addition to informing consumers about how and where their holiday turkey came from, it also allowed farmers to share information about themselves directly to end consumers.

The program improved brand loyalty and trust through increased transparency and the sharing of stories. While Cargill did not charge retailers more for the traceable turkeys, retailers were able to apply premium pricing at their discretion.

Understanding traceability requirements

Traceability by sector

While traceability requirements vary depending on the nature of the food business, two key concepts underpin every solution:

Critical Tracking Event (CTE): The point at which product is transformed, moves between premises, or data capture is necessary to maintain a continuity of information.

Key Data Element (KDE): Information that is necessary to successfully trace a product and / or its ingredients through all relevant CTEs.

CTEs and KDEs will vary depending on the nature of the business and its supply chain — but it is generally possible to categorize supply chain structure and traceability requirements into:

- Bakery
- Dairy
- Meat and Poultry
- Processed
- Produce
- Seafood



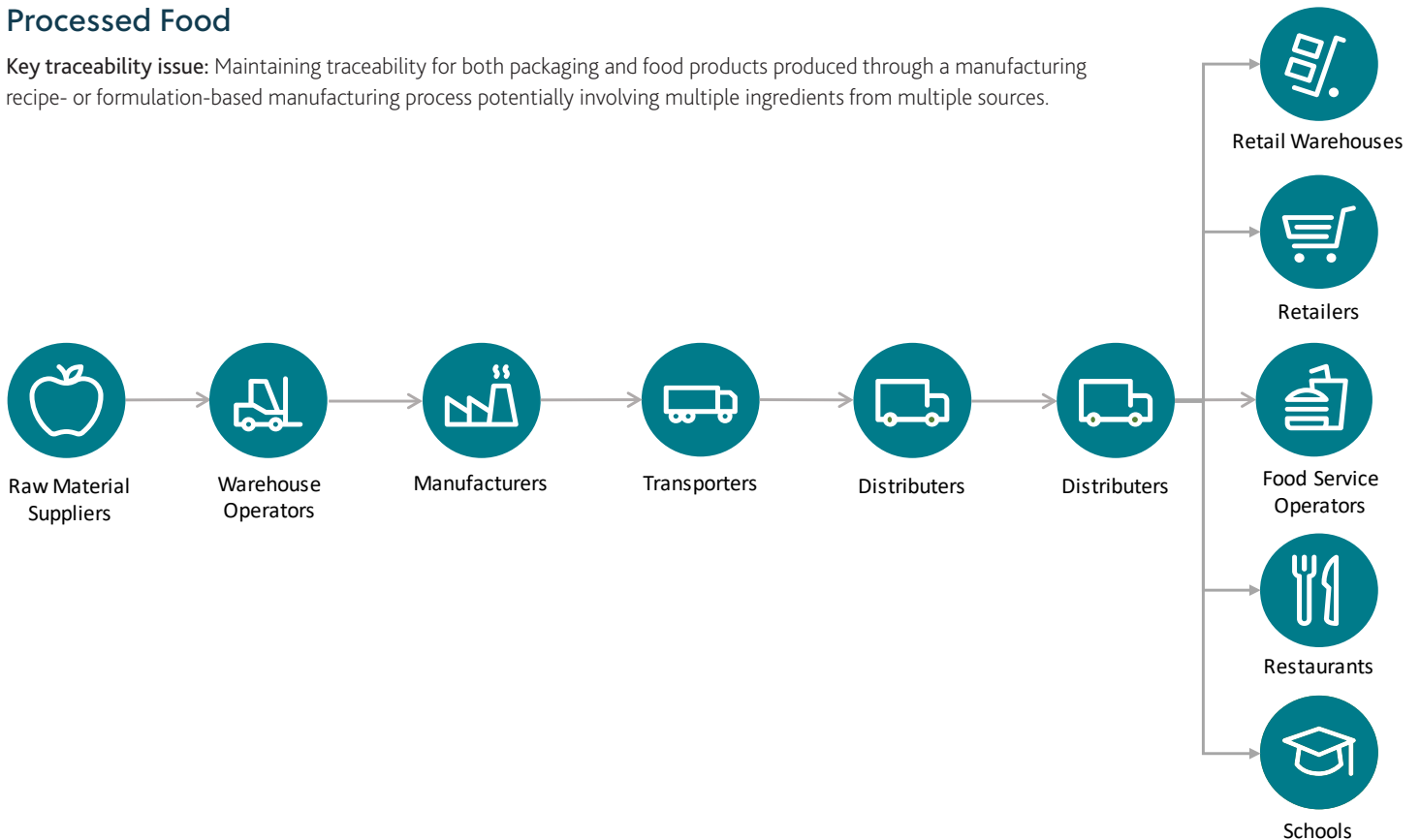
Does your business support traceability?

MNP can evaluate your supply chain management systems to confirm you're capturing all the required KDEs at every CTE in your supply chain.

Each supply chain has its own CTEs and KDEs. Typical supply chains are illustrated below:¹

Processed Food

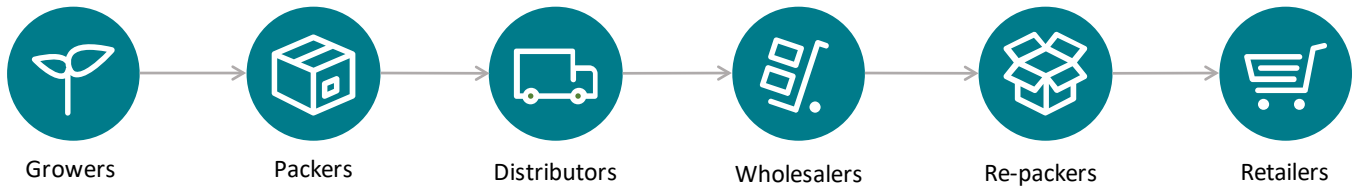
Key traceability issue: Maintaining traceability for both packaging and food products produced through a manufacturing recipe- or formulation-based manufacturing process potentially involving multiple ingredients from multiple sources.



¹All supply chain diagrams based on "A Guidance Document on the Best Practices in Food Traceability" by Jianrong Zhang and Tejas Bhatt in *Comprehensive Reviews in Food Science and Food Safety* Vol 13, 2014.)

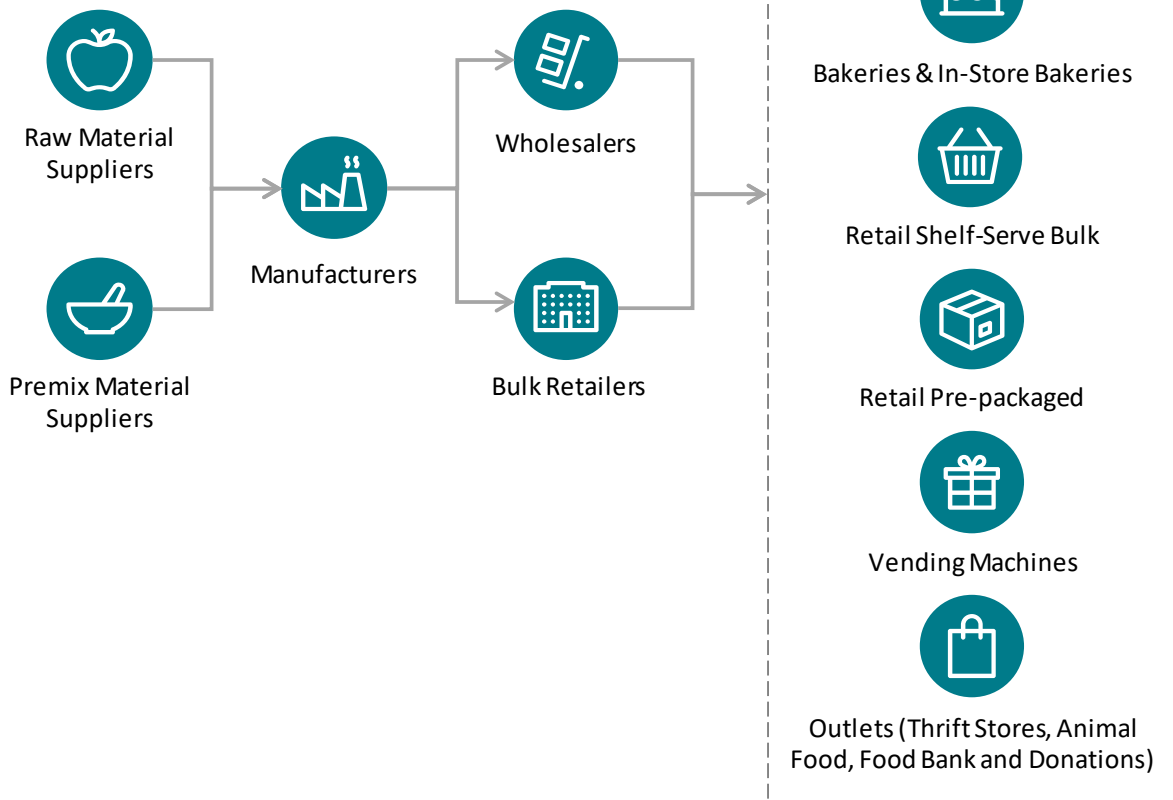
Produce

Key traceability issue: Ability to trace retail-level products to specific farm-level locations and report on agronomy such as organic practices or chemical inputs such as herbicides, pesticides and fertilizers that were used.



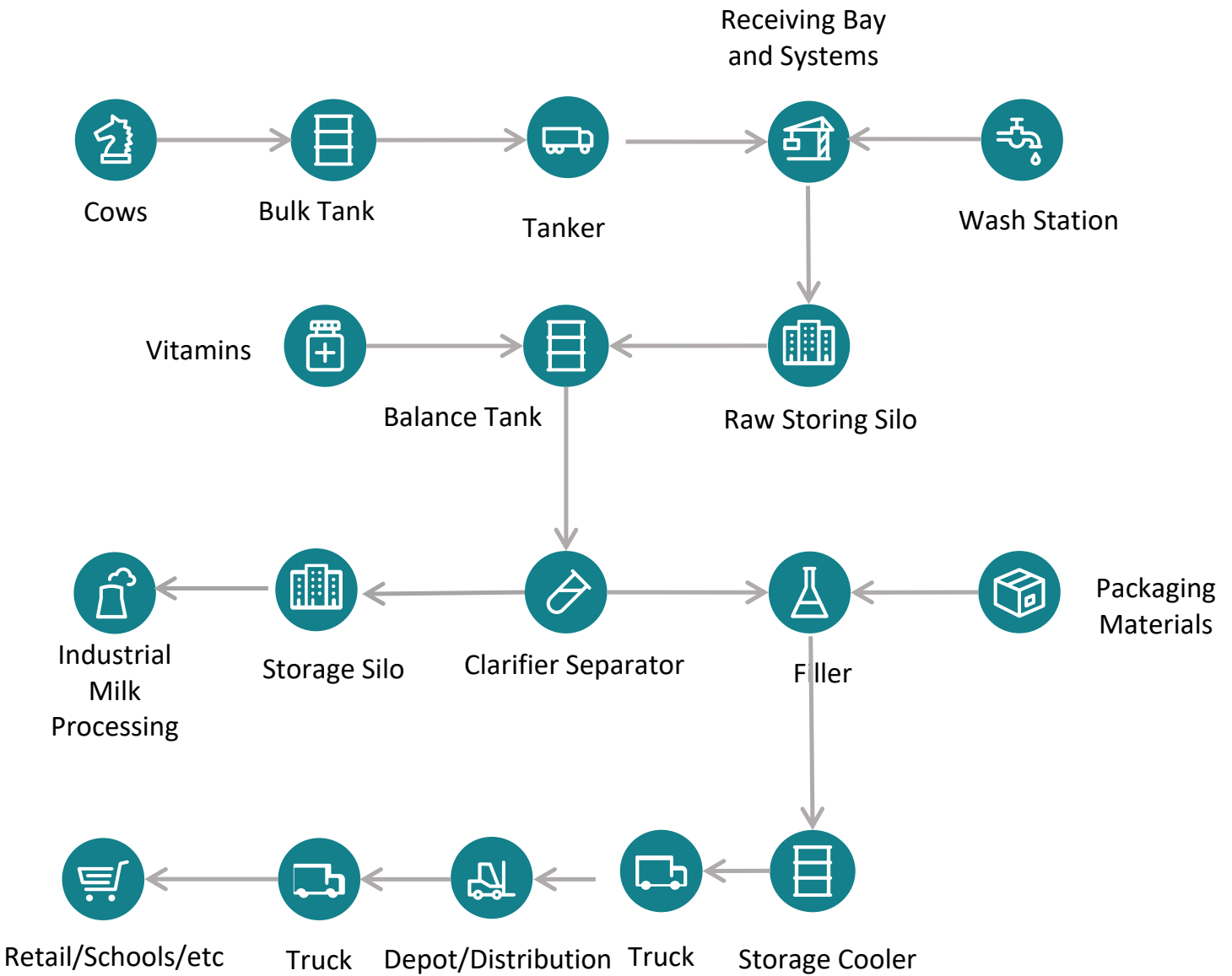
Bakery

Key traceability issue: Maintaining traceability through a recipe- or formulation-based manufacturing process which involves multiple ingredients from multiple sources.



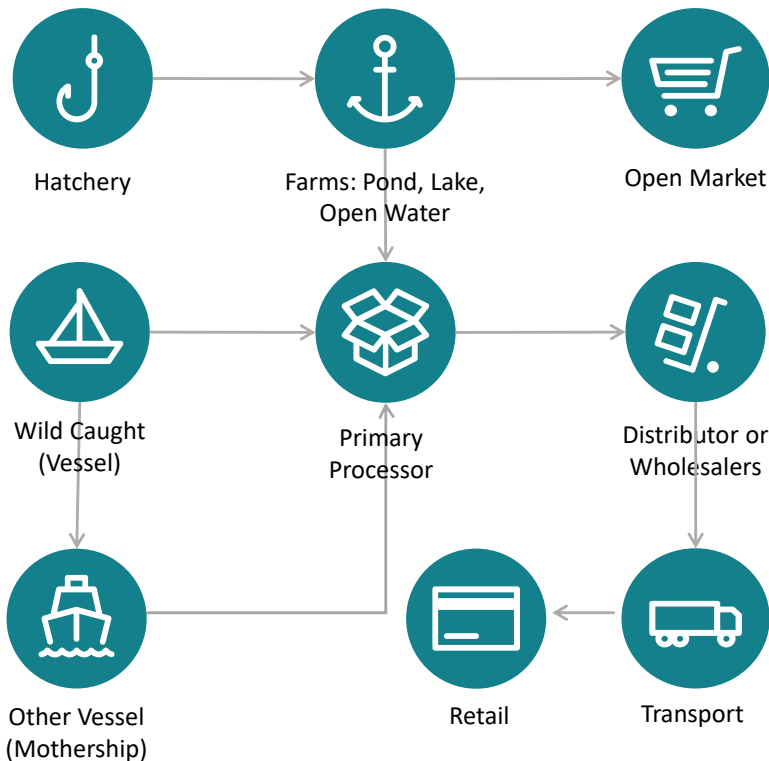
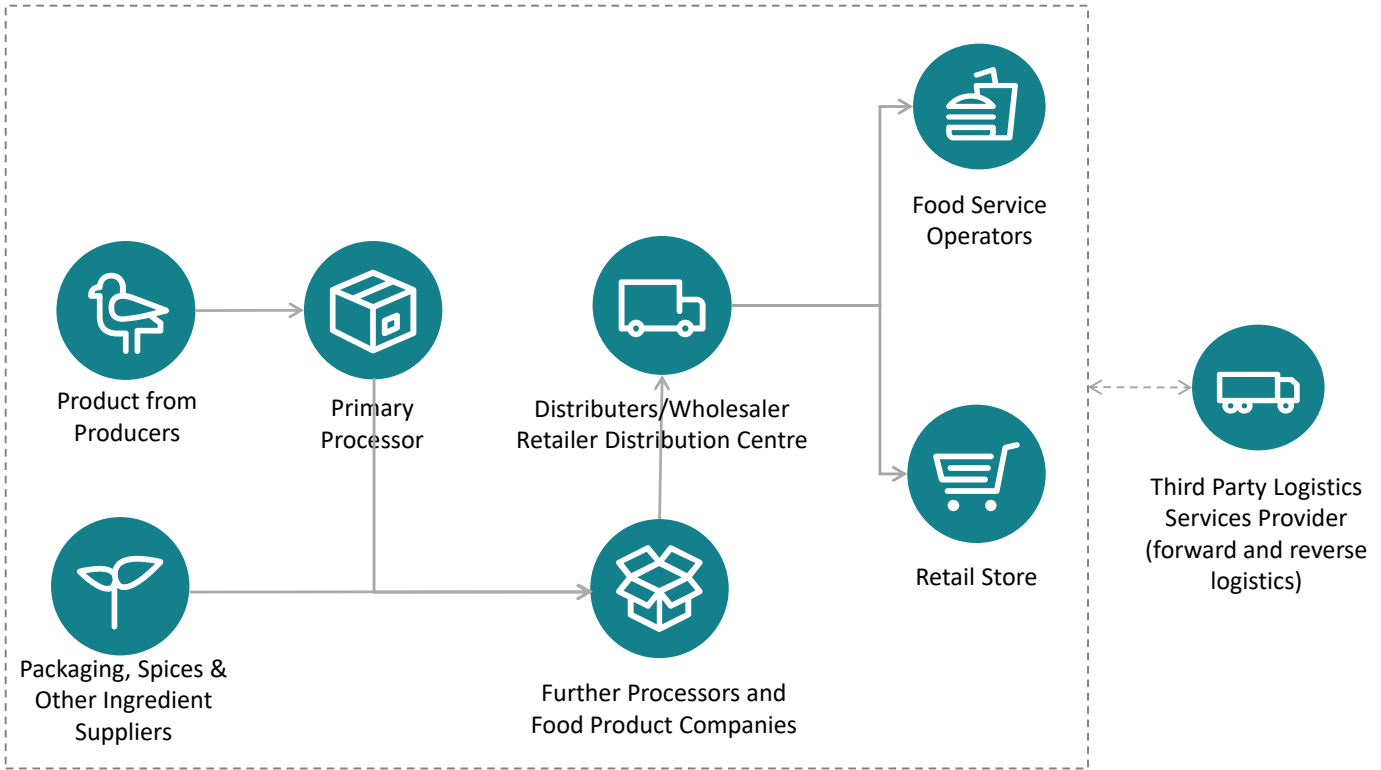
Dairy

Key traceability issue: Tying a retail package to source cows through a supply chain that involves storage tanks with combined batches of milk — as well as



Meat & Poultry

Key traceability issue: Tying a retail package to specific source animals, as well as reporting on feed inputs and storage details along the supply chain.



Seafood

Key traceability issue: The ability to demonstrate that a specific retail package is sourced from a legally permitted fishery and that the species is labeled correctly.

Canadian regulatory requirements

Canadian food and beverage processors must comply with new Safe Food for Canadians Regulations (SFCR) for safety and traceability which became effective January 15, 2019 and replaced a broad set of legacy regulations. Additional SFCR will be phased in over a two-year period.

The initial SFCR regulations applied to:

- Meat
- Fish
- Dairy
- Processed produce
- Fresh produce
- Maple and honey products

On July 15, 2020 (unless delayed by the COVID-19 pandemic) SFCR will also go into effect for:

- Unprocessed food used as grain, oil, pulse, sugar, or beverage
- Additives and alcoholic beverages
- All other foods

The SFCR traceability requirements for these industry segments apply to most food businesses that have gross sales of over \$100,000, employ more than four people, and:

- Import food
- Export food
- Distribute or transport food products across provincial or territorial borders
- Manufacture, process, treat, preserve, grade, store, package, or label food to be exported or sent across provincial or territorial boundaries
- Grow and harvest fresh fruits or vegetables to be exported or sent across provincial or territorial boundaries
- Slaughter food animals from which meat products are derived, and where the meat product is exported or sent across provincial or territorial boundaries
- Store and handle edible meat products in their imported condition for inspection by the Canadian Food Inspection Agency (CFIA)
- Sell food to consumers at retail, which would need to be traced one step back but not forward to the consumer

Most of these requirements go into effect for smaller enterprises with gross sales of less than \$100,000 or with four or fewer employees on July 16, 2021. The traceability requirements do not apply to restaurant and other similar enterprises.

Traceability documentation

SFCR requires businesses which fall into the above listed categories maintain records (traceability documents) that enable them to "trace the source of each food supplied to them (one step back) and its next destination (one step forward) and can access timely and precise information as needed.

The traceability documents must:

- Identify the food, including the common name of the food, the name and address of the person who manufactured, prepared, produced, stored, packaged or labelled the food, and a lot code or other unique identifier to trace the food
- Trace the food one step back to the person who provided the food, including the date on which the food was provided
- Trace the food one step forward to the person to whom the food will be provided, including the date on which the food was provided
- Identify and trace back the ingredients used to make the food, including the date on which they were provided (if applicable)
- Identify and trace back the food animals slaughtered (if applicable)

Clear and readable records are to be maintained for two years, accessible in Canada, and provided to CFIA (Canadian Food Inspection Agency) upon request. Electronic records need to be provided in a single file and in a format that can easily be opened and used by standard commercial software.

At a minimum, the following information is required:

- Name, address, and contact information for suppliers and a description of products or inputs supplied
- Name, address and contact information for customers and a description of the product supplied to them
- Date of transaction or delivery
- Batch or lot identification (or other markings)
- Volume or quantity of product supplied or received
- Any other relevant production records specific to the applicable food and beverage sector(s)

CFIA definitions for lot code and unique identifier

Lot code refers to a numeric, alphabetic or alphanumeric code that can be used to identify a product batch that was manufactured, prepared, produced, stored, graded, packaged, or labeled, under the same conditions.

Unique identifier refers to a code that can be used to identify a defined quantity of food. This may include a lot code, purchase order number, or a bill of lading number.



The state of the art

How should food and beverage processors best implement traceability? Can this be done simply with a few tweaks to their existing supply chain management systems?

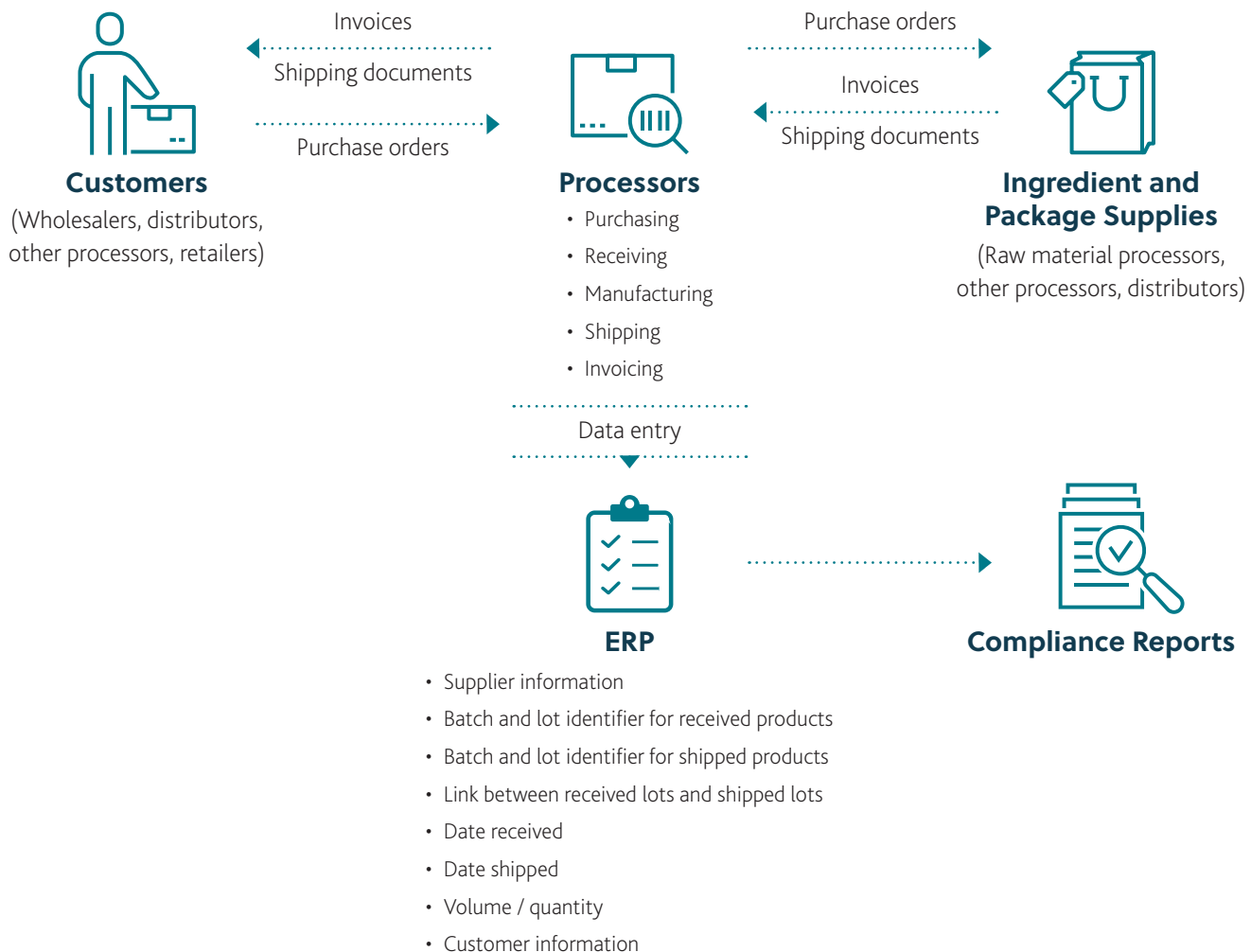
Components of a traceability solution

Compliance with one-step-back and one-step-forward

Enterprise resource planning (ERP) systems manage details of purchasing, inventory control, production / manufacturing lot control, and sales.

With appropriate configurations, these systems will produce the traceability documents SFCR requires if you're responsible for reporting only on the inputs received and the products sent forward to the next participant in the food and beverage supply chain.

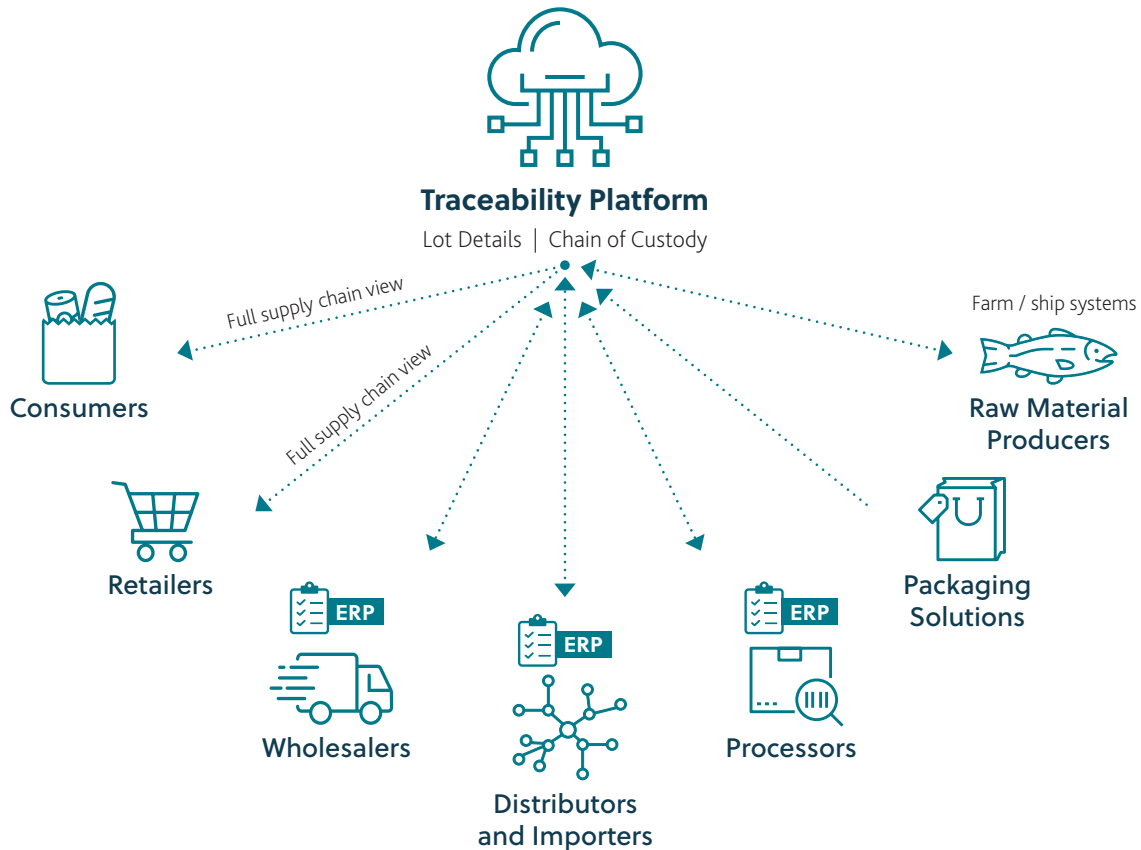
When using an ERP for traceability, regulatory compliance implies an architecture such as one depicted below:



Winning in the marketplace

However, ERP systems will not be adequate if you're aiming for traceability to build consumer loyalty, boost your brand, and differentiate your products and company in the marketplace. Typical ERPs are too internally focused and lack visibility into all the key data elements and stories for the entire supply chain.

Realizing these benefits requires a solution that allows every participant in the supply chain to have line of sight into the product's journey. This implies a very different architecture. One that not only manages all internal CTEs and KDEs for every participant — but also makes these KDEs available to every participant, including regulators and end consumers.



A full traceability solution has the following key characteristics:

- An internal ERP which fully supports the internal CTEs and KDEs
- A platform every supply chain participant can access to document and retrieve shareable KDEs
- Integrations between the ERP and traceability platform
- Functionality for retailers, end consumers, and others to access traceability data for the entire supply chain
- Functionality for producers to publish marketing stories to end consumers
- Purchasing / sales agreements that oblige every supply chain participant to publish the necessary data on the traceability platform

The solution landscape

ERPs

Numerous ERP solutions can address the specific information requirements for the major food and beverage industry segments. Most ERPs geared towards medium- to large-sized manufacturers have a food and beverage version targeted at the processed food segment.

The other segments typically utilize niche ERP products targeted specifically to their needs. While most established ERP vendors are attempting to manage the necessary CTEs and KDEs, some are more effective than others.

MNP can help you select an ERP that supports traceability

MNP often assists clients evaluate and select ERP solutions. Evaluating ERP products in terms of support for CTEs and KDEs needed to support traceability is an integral part of our software selection methodology for food and beverage clients.

Many supply chain management ERPs, including those targeted toward food and beverage processors, market themselves as traceability solutions. This is true, but only in the limited sense of regulatory compliance. These are not multi-party full chain traceability platforms and lack the robust functionality of the other platforms below:

Traceability platforms

A limited number of traceability platforms provide multi-party farm-to-fork visibility. **These include:**

| Traceability Platform | Bakery | Dairy | Meat & Poultry | Processed Foods | Produce | Seafood | Packaging |
|-----------------------|--------|-------|----------------|-----------------|---------|---------|-----------|
| IBM Food Trust | X | X | X | X | X | X | X |
| fTrace | | | X | | | X | |
| Verify Technologies | X | | X | X | | | X |
| Optel | | | | X | X | | X |
| Food Logiq | | | | X | X | | |
| RFXcel | | | | X | X | | |
| Trace Register TR5 | | | | | | X | |
| This Fish Inc. | | | | | | X | |

IBM Food Trust

This broad multi-party traceability platform supports all food and beverage sectors. It uses blockchain to provide a shared distributed ledger for securely managing supply chain information — and includes application programming interfaces (APIs) for integration with participants' ERP systems.

IBM provides self-serve onboarding tools as well full-service onboarding. The platform offers scalable options for small (less than US\$50M), medium (between US\$50M – US\$1B), and large enterprises (greater than US\$1B).

fTrace

This cloud-based service from fTrace GmbH — a fully-owned subsidiary of GS1 Germany — supports full-chain traceability from raw material producers to consumers. As the non-profit responsible for developing and maintaining the GS1 standard, its solution also ensures every package member organizations produce receives a barcode which can be scanned to retrieve full upstream traceability.

fTrace GmbH provides onboarding services for clients. The platform primarily caters to the meat and poultry and seafood segments.

Verify Technologies

Verify provides manufacturing solutions for food and beverage, medical devices and pharmaceutical industries — along with a multi-party traceability platform. The company offers pre-built integrations with several major ERP solutions and focuses primarily on bakery, meat and poultry, processed foods, and packaging segments.

Optel

Optel's traceability platform is primarily used in life sciences and processed food and produce segments — along with its myriad manufacturing, warehouse management, inventory control, and inspection solutions. The company supports packaging traceability, provides consumer engagement tools, and offers custom integrations to participants' ERP systems.

Food Logiq

Food Logiq primarily provides quality, compliance, supplier management, and GS1 compliant traceability solutions to the processed food and produce segments. Participants include growers, shippers, packers, distributors, importers, processors, and grocery and retail outlets.

RFXcel

RFXcel's serialization, quality, compliance, and traceability solutions for the food and beverage industry cater primarily to the processed foods and produce segments. Its multi-party full traceability platform is GS1 compliant and includes integrations with a range of ERP systems. Participants include growers, shippers, packers, distributors, importers, processors, and grocery and retail outlets.

Trace Register TR5

Trace Register' traceability platform focuses strictly on seafood. TR5 allows data entry from multiple parties in a supply chain platform and provides full traceability from ship to retail.

The solution supports GS1 and Global Dialogue for Seafood Traceability (GDST) standards — and provides data exchange integration services with ERP systems.

Users of TR5 include fishermen, processors, importers, distributors, and retailers. It is among the more established industry-specific traceability platforms.

This Fish Inc.

This Fish provides a traceability solution for the seafood industry as well as production management software. It provides integration tools and an API to connect with ERP and accounting systems.

Sustainability and certification platforms

Demonstrating a commitment to certified environmentally sustainable practices for raw material sourcing is one of the most prominent drivers for traceability. Several platforms focus primarily on tracking sustainability-related information and supporting independent third party certification. These are most common in the seafood and livestock (meat and poultry) sectors — as well as some plant products such as coffee, palm oil, cocoa, and sugar — and include:

- **OpenSC**
This blockchain-based traceability platform was co-founded by World Wildlife Fund Australia, Boston Consulting Group Digital Ventures, and Humanity United Working Capital Fund. It provides full multi-party traceability with an emphasis on supporting certification and verifying ethical production, supply chain, and consumer engagement claims. As of 2019, several major brands are using the platform in pilot projects, primarily in the seafood sector.

- **TrustBIX**
TrustBix provides a cloud-based third-party data exchange platform to support traceability in the beef and cattle segments, along with financial incentives to cattle producers.

Under its Canadian Beef Sustainability Acceleration Pilot program, an independent body audits and certifies cattle producers using sustainability indicators developed by the Canadian Roundtable for Sustainable Beef. Producers may then sign up on the TrustBix platform to publish certified cattle information through the full beef supply chain. TrustBIX receives a transaction fee based on the number of fully certified cattle, with funds paid by the retailers and restaurants who source the beef. Cattle producers receive a partial rebate on these payments as an incentive to participate.

Seafood

The seafood industry offers several solutions that specifically provide traceability information for the source catch. Vancouver-based Vericatch and New Zealand-based Fishtale both capture detailed seafood catch information and tag the fish with a QR code which is passed along the supply chain. But neither platform manages data from the various downstream processing steps.

These platforms only retrieve catch information and provide it to consumers and other participants in the supply chain — helping fishers promote their products to processors and consumers, build brand equity, and demonstrate sustainable fishery practices.

Implementing a traceability solution

MNP's proven approach to helping processors implement traceability ensures regulatory compliance and creates opportunities to develop branded marketing programs. We help you through a two-stage planning and implementation process.



Planning

Establish traceability program and supplier agreements. Secure executive commitment to internal processes and systems. Negotiate with suppliers to ensure traceability is a key element throughout the entire supply chain. And agree on a third-party traceability platform to publish KDEs.

Identify all critical tracking events (CTEs). Review manufacturing process, identify all CTEs, and ensure all suppliers do the same.

Identify all key data elements (KDEs). Document all KDEs that need to be recorded for each CTE and ensure all suppliers do the same.

Evaluate ERP / supply chain / manufacturing systems for managing CTEs and KDEs. Review process management systems to determine whether they can track all CTEs and KDEs and ensure all suppliers do the same.

Evaluate and select third-party traceability platform. Evaluate the available third-party traceability platforms to determine whether they:

- Support your CTEs and KDEs
- Provide adequate consumer marketing capabilities
- Integrate with your systems to exchange CTEs and KDEs



Implementation

Configure ERP. Configure ERP and other systems to capture the required KDEs and ensure all suppliers do the same.

Test configuration for traceability support. Conduct a test recall to confirm all systems in the supply chain are capturing the required KDEs.

Sign-on with traceability platform. Negotiate an agreement with the selected third-party platform to publish and report full supply chain traceability information. Ensure all suppliers sign on with the same platform.

Integrate ERP and traceability platform. Implement and test data exchange with the traceability platform.

Design traceability-oriented marketing program. Differentiate your products and company in the marketplace by promoting your traceability program and enabling retailers / consumers to access traceability information via the selected third-party platform.

Go-Live. Launch traceability and marketing programs and reap the benefits.



How MNP can help

With deep roots in Canadian agriculture, national presence and experience enhancing business performance across every sector of the food and beverage industry, MNP is your ideal partner to help you implement a traceability solution that will:

- Protect your business from health and safety risks,
- Ensure regulatory compliance, and
- Grow your bottom-line by enhancing your brand.

To learn more, contact:



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About MNP

MNP is a leading national accounting, tax and business consulting firm in Canada. We proudly serve and respond to the needs of our clients in the public, private and not-for-profit sectors. Through partner-led engagements, we provide a collaborative, cost-effective approach to doing business and personalized strategies to help organizations succeed across the country and around the world.



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