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# Introduction to traceability

Traceability in the context of the [National Agricultural Traceability Strategy](https://www.agriculture.gov.au/biosecurity-trade/market-access-trade/national-traceability) refers to the ability to track and trace the journey of products through the entire supply chain.

Traceability requires knowing where a product was, is, or is going and an unambiguous and ideally unique definition of location. Similarly, movement and handling history and regulatory oversight (for compliance and certification) cannot be achieved without clear and precise identification of responsible parties – natural persons or businesses. In summary, the what (product), where (location/place), who (responsible party), why (supply chain process), along with when (via earth time and date conventions).

Traceability can be thought of as a national and industry capability rather than an objective on its own. Even though the recent focus on traceability in Australia has been for food safety and biosecurity purposes, the ability to trace products through a supply chain is an enabler, a capability that allows both industry and government to achieve various objectives. This includes safety, quality, reporting, compliance, supply chain efficiency, product provenance verification and customer engagement, among others.

According to ISO 9001:2015, traceability is ‘the ability to trace the history, application or location of an object’ in a value chain.

The traceability concept encompasses several key aspects:

* Origin tracking – Knowing where a product was produced, including specific details about the farm, region, or production facility. This information is crucial for confirming the authenticity and origin of the product.
* Movement and handling history – Monitoring the product's journey through various stages, including processing, transportation, and storage. This includes who handled the product and when, ensuring a clear record of the supply chain.
* Product data/attributes – Detailed data about the product itself, such as type, quantity, quality, and any treatments it has undergone (like organic certification, pesticide use, etc.).
* Safety and quality assurance – Ensuring that the product meets certain standards of safety and quality.
* Compliance and certification – Verifying that products comply with regulatory requirements and certifications, such as organic, free-range, or non-GMO labels.

At the heart of any traceability system is the identification of traceable objects.

A traceable object is a physical or digital object for which there is a need to retrieve information about its history, application, or location. Examples of traceable objects in agriculture include products (e.g. grain, crops, livestock), logistic units (e.g. truck trailers, shipping containers, cartons, palletised goods) and assets (e.g. trucks, vessels, trains).

For the physical identification of traceable objects, generally 3 main levels of identification can be distinguished:

1. Class-level identification, where the object is identifiable by its product / part ID, enabling it to be distinguished from different kinds of products or parts.
2. Batch/lot-level identification, where the product / part ID is extended with a batch/lot number, limiting the number of traceable objects with the same ID to a smaller group of instances (for example, items produced at the same time).
3. Instance-level identification, where the traceable object is identified with a serialised ID, limiting the number of traceable objects with the same ID to one individual instance.

The objectives of the traceability system and the supply chain itself are key criteria to determine the right level of identification. For example, regulated products and ingredients will be identified at batch/lot- or instance-level.

Industries and businesses will often apply a combination of identification levels. For example, this is a common practice in transformation events arising in manufacturing, where the inputs in a manufacturing process include primary and secondary ingredients/materials. Taking the example of making canned tuna, primary ingredients/materials would comprise tuna loin, olive oil and cans, whereas empty cartons (in which the cans are packed into) would belong to secondary materials.

Traceability and its benefits are covered in-depth in the National Traceability Strategy.

For readers that would like to know more about traceability, the following resources are recommended:

* Australian Digital Economy and Digital Trade Strategy (2018) (Australian Government, Department of Foreign Affairs and Trade, 2022)
* [National Agricultural Traceability Strategy 2023 to 2033](https://www.agriculture.gov.au/sites/default/files/documents/national-agricultural-traceability-strategy.pdf) (Australian Government, Department of Agriculture, Fisheries and Forestry, 2023b)
* [National Framework for Recycled Content Traceability](https://www.dcceew.gov.au/environment/protection/waste/recycled-content-traceability) (Australian Government, Department of Climate Change, Energy, the Environment and Water, 2023)
* Enhancing traceability and transparency of sustainable value chains in the garment and footwear sector UNECE United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) Recommendation No. 46, (UNECE, 2022).

**Acknowledgement of Country**

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

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