

Farm Data Standards

# Animal Data Standard

Version 1.0.1



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# 1 Document Management

## 1.1 Referenced Documents

[ISO 11784](#):1996 Radio frequency identification of animals – Code structure, reviewed and confirmed in 2010

[ISO 11785:1996/Cor 1:2008](#) Radio Frequency identification of animals – Technical concept

[NAIT Animal Identification and Tracing Act 2012](#), 20 February 2012

[GS1 EPCglobal Tag Data Standard \(TDS\) v1.8](#), February 2014

[GS1 EPCglobal Tag Data Translation \(TDT\) Standard v1.6](#), October 2011

[EPC Information Services \(EPCIS\) Version 1.0.1 Specification](#), September 2007

[International Agreement of Recording Practices, Guidelines](#) approved by the General Assembly of the International Committee for Animal Recording – ICAR, June 2012.

[The complete ICAR approved RFID devices and corresponding Manufacturers' Codes](#), International Committee for Animal Recording – ICAR, last updated 27 March 2014

[ICAR Guidelines 2012](#), Section 8 Annex 1, pp 479-481, Breed Codes on Bovine Semen Straws for International Trade assigned by ICAR Sub-committee Interbull, International Committee for Animal Recording.

[Search the ACVM Register](#) or view the [entire register](#), Ministry for Primary Industries Online

[AgriBase™](#),ASUREQuality

[New Zealand Industry Agreed Velvet Grading Guidelines](#), Deer Industry New Zealand, September 2013

[Oklahoma State University Livestock Breeds](#)

[FAO Domestic Animal Diversity Information System](#), choose Breeds then Breed data sheet

[Surgical Procedures](#), American College of Veterinary Procedures, 2012

GS1 standards for business messaging, [EANCOM/GS1 XML](#)

United Nations rules for Electronic Data Interchange for Administration, Commerce and Transport, [EDIFACT](#)

OASIS Universal Business Language, [UBL](#)

## 1.2 Related Documents

Related standards documents to be published in 2014 on the [Farm Data Standards website](#) include:

- Stock Reconciliation Data Standard
- Financial Data Standard.

## 1.3 Latest Revisions

The users of this standard should ensure that their copies of the above-mentioned documents are the latest revisions. The latest version of this Standard will always be published at [www.farmdatastandards.org.nz](http://www.farmdatastandards.org.nz).

## 1.4 Review of Standards

Suggestions for improvement of this document will be welcomed. Submit your comments using the feedback mechanisms at [www.farmdatastandards.org.nz](http://www.farmdatastandards.org.nz).

## 1.5 Errata

Version 1.0.1	Appendix B.1 Observations Category: Dairy Production Observation: Drying Off	The field "Lactation Start Date" was incorrectly named and has been corrected to "Lactation End Date".
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## 2 Introduction

### *2.1 Overview*

Pastoral farming is becoming a data rich activity. Most biophysical processes from soil nutrient management to cow performance have both paper based and more organised data bases recording status, productivity and intentions. There are a significant number of tools covering livestock, nutrition and financial management. Most of these require the user to re-enter data from other sources and they overlap in functionality. It is probable that if data had been more accessible their design would have better focussed on the service they undertook to provide. Farmers will benefit from a highly innovative technology sector that delivers applications that are simple to use and access, which source the information they need without impedance and deliver value.

This document is part of a work stream focusing on Data Standards for interchanging Livestock (Animal) data. Work on this project commenced in late 2012, funded by DairyNZ and with contributions from FarmIQ Systems and Rezare Systems.

### *2.2 Outcome Statement*

Broad adoption of a common vocabulary and data dictionary for exchange of farm information will result in farmers and other industry parties entering data only once and having that data readily accessible for populating multiple decision-making systems. As a result, industry and individual farm businesses will be better placed to undertake systems analysis to inform management practice. More accurate and structured interchange of farm data will also support industry breeding objectives and other information system targets.

### *2.3 Scope and Application*

This standard addresses the following areas:

- The identification of animals, herds and locations
- Animal “life data” including animal characteristics, parentage, and state information.
- Representation of collective groups of animals ranging from herds or flocks, physical management groups such as mobs through to logical groups for analysis and planned groups such as a draft list.
- Observations including records of an activity carried out, events that have occurred and measurements that have been taken.

## 2.4 Interpretation

For the purposes of this standard, the word SHALL refers to requirements that are essential for compliance with the standard, while the word SHOULD refers to practices that are advised or recommended. The term MAY is used to distinguish a permissible or optional practice.

The terms 'Normative' and 'Informative' have been used in this standard to define the application of the Appendix to which they apply. A 'Normative' Appendix is an integral part of a standard while an 'Informative' Appendix is only for information and guidance.

## 2.5 Definitions and Abbreviations

For the purposes of this standard, the following definitions shall apply:

Term	Definition
ACVM	Agricultural compounds & veterinary medicines
EID	Electronic Identification – industry shorthand for RFID
DIGAD	Dairy Industry Good Animal Database (New Zealand)
GS1	A Global Standards organisation
ICAR	International Committee for Animal Recording
IETF	Internet Engineering Task Force
ISO	International Organization for Standardization)
Herd	A herd is a special case of a management group
LIA	Livestock Improvement Association
LIC	Livestock Improvement Corporation (often used to indicate the MINDA recording system operated by LIC)
MPI	Ministry for Primary Industries
NAIT	National Animal Identification & Tracing
OGC	Open Geospatial Consortium
RFC	Request for Comments, a publication of IETF
RFID	Radio-frequency Identification
SIL	Sheep Improvement Limited
SKU	Stock keeping unit
UN/CEFACT	United Nations/Centre for Facilitation of Procedures and Practices in Administration, Commerce and Transport
URI	Uniform Resource Identifier
URN	Uniform Resource Name
XML	Extensible Mark-up Language



## 3 Identification of Animals, Herds, and Locations

This section focuses on the identification of animals and other entities referenced in the interchange of animal information, specifically locations and enterprises (herds or flocks).

### *3.1 Animal Identification*

There are a number of official, semi-official, and ad-hoc forms of animal identification in use. This ranges from the regulated<sup>1</sup> use of ISO 11784/11758 RFID for cattle and deer, through current official recording and traceability programme identifiers (some regulated), to breeding and recording scheme identifiers that are no longer actively used but which provide useful data or linkages between animals that need to be retained for future analysis.

Identifiers fall into one of three broad categories:

1. **Official recording scheme identifiers** – lifetime identifiers allocated to animals by an official recording scheme, typically as part of a traceability or herd improvement programme.
2. **Electronic identifiers** – unique numbers carried on a machine-readable tag or chip applied to animals, electronic identifiers are intended to be lifetime identifications (but may in fact be changed or replaced), and may also be required as part of a traceability or herd improvement programme. Electronic identifiers may in some cases also be official identifiers.
3. **Management identifiers** – these are typically short-form visual tags or marks applied to animals to make identification easy within a single management unit (herd or farm). There is no guarantee that these identifiers are truly unique within a farm, and they are almost certainly not unique temporally or nationally.

Appendix C includes a list of animal identifiers in use in New Zealand.

A single clearly enunciated identifier type for all animals is not yet practical because of the need to support legacy data, recording devices and systems, and because there is often value for humans in being able to interpret parts of a human-readable identifier.

**Accordingly this standard specifies:**

1. **A single animal MAY have more than one identifier but SHALL have at least one identifier that is unique within its namespace;**

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<sup>1</sup> NAIT Animal Identification and Tracing Act 2012  
(<http://www.legislation.govt.nz/act/public/2012/0002/latest/DLM3430220.html>).

2. When interchanging data between systems, each animal identifier SHALL include a URN (RFC 2141 Uniform Resource Name)<sup>2</sup> namespace identifier, so that software systems can determine how to interpret each identifier;
3. When interchanging data between systems, each animal identifier SHOULD also specify the type of identifier (Official, Management, and/or Electronic) so that a receiving system which is unable to interpret namespaces may use a generic method to interpret the identifier; and
4. It SHALL be the responsibility of systems interacting with legacy software, databases, and devices to interpret interchanged animal identifiers to or from the form used by the legacy system.
5. For specific interchanges agreed between two parties, the parties MAY agree to exchange identifiers within a single namespace only, and dispense with the namespace prefix.

The following are examples of URN notation used for ISO 11784 and GS1 SGTIN identifiers:

ID
urn:epc:id:sgtin:3.003700.00542.77346595
urn:iso:std:iso:11784:982.009104636715

These are based on name space definitions for EPC (Electronic Product Code) defined in RFC 5134<sup>3</sup> and for ISO (International Standards Organisation) defined in RFC 5141<sup>4</sup>.

### 3.1 Location Identification

Distinct identification of locations is required in animal recording to support both traceability systems and identification of environmental contemporary groups for genetic analysis. A number of identifiers are accepted for property identification in New Zealand:

- Ministry for Primary Industries FarmsOnLine identifier;
- AgriBase<sup>5</sup> farm\_id (based on a coordinate pair in lat/long, NZTM or NZMG coordinates)
- EPCglobal Serialised Global Location Number<sup>6</sup> (as used by the NZ Business Number system); and

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<sup>2</sup> URN is defined in RFC 2141 (<http://tools.ietf.org/html/rfc2141>)

<sup>33</sup> EPC Namespace for URN is defined in RFC 5134 (<http://tools.ietf.org/html/rfc5134>)

<sup>4</sup> ISO Namespace for URN is defined in RFC 5141 (<http://tools.ietf.org/html/rfc5141>)

<sup>5</sup> AgriBase, AsureQuality (<https://secure.asurequality.com/capturing-information-technology-across-the-supply-chain/agribase-database-for-new-zealand-rural-properties.cfm>)

<sup>6</sup> EPCglobal SGLN and GLN are defined at <http://www.gs1.org/gdsn/standards>

- Regulated Dairy Herd Testing Location identifier using the NZMS1 (1939 to 1975) map grid reference.

For historic reasons it will be necessary to support the interchange of data utilising all of these mechanisms. This standard therefore requires that location identifiers SHALL be prefixed with a URN namespace identifier.

**Acceptable URN namespaces for use in New Zealand location identifiers SHALL be:**

- **urn:epc:id:sgln** or
- **a nzl: registered location namespace.**

**For specific interchanges agreed between two parties, the parties MAY agree to exchange identifiers within a single namespace only, and dispense with the namespace prefix.**

### *3.2 Herd and Flock Identification*

Distinct identification of flocks or herds as the primary unit of management of a group of animals is used for traceability purposes, access control and membership, and contemporary groups for genetic analysis. There are a number of systems in use within New Zealand, including:

- NAIT numbers;
- AHB herd numbers;
- Dairy Industry Herd Numbers (a combination of a location and a herd number) and Participant codes;
- Beef+Lamb NZ Genetics (formerly SIL) flock code.

This standard requires that herd identifiers shall be prefixed with a URN namespace identifier.

For specific interchanges agreed between two parties, the parties may agree to exchange identifiers within a single namespace only, and dispense with the namespace prefix.

### *3.3 Registration of Namespaces*

This standard requires the addition of a namespace when exchanging an identifier. While some namespaces have been formally registered (RFC 5134 for EPC and RFC 5141 for ISO), there has not previously been a method for registering other namespaces for use in animal recording.

A registry process for top-level namespaces is administered by IETF (the Internet Engineering Task Force), and the process for using this is defined in RFC 3406<sup>7</sup>.

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<sup>7</sup> See <http://www.ietf.org/rfc/rfc3406.txt>

New Zealand livestock and farm recording system identifiers SHALL be registered at [www.farmdatastandards.org.nz](http://www.farmdatastandards.org.nz), and issued with Namespace identifiers in the urn:nzl:farm: namespace (the NZ namespace was registered in RFC 4350<sup>8</sup>). Each NZ farm recording namespace registered SHALL specify:

1. The official name or description of the namespace;
2. The organisation responsible for maintaining the namespace and issuing identifiers;
3. Contact details for the organisation;
4. A regular expression that may be used to determine if identifiers within the namespace are in the correct format (but not necessarily valid issued identifiers).

## 4 Animal Life Data

When people talk about “life data” or “static data” for animals they mean information excluding trait, event, or observation data (such as measurements). Typically this means unchanging or static attributes of the animals themselves. However, some of this data does change over time, so “static” data can be a misleading term, and the term “life data” is preferred as it has been well used and doesn’t have the same connotation of unchanging data.

In preparing this section of the Standard, the New Zealand Dairy Herd Test Regulations, Dairy Herd Testing Standard (NZS 8100:2007), Dairy Industry Good Animal Database (DIGAD) interchange specifications, NAIT data model and interchange specifications, Beef + Lamb Genetics SIL database, and FarmIQ animal attributes were reviewed. Additionally, the ICAR Guidelines and Interbull standards were reviewed, as well as work carried out by Gallagher Group and Tru-Test on Animal Data Interchange XML.

Life data of animals may be categorised as follows:

1. **Animal identification** provides one or more identifiers for an animal (section 3).
2. **Animal Characteristics** are non-changing attributes of an animal such as species and breed, which may be gathered over the lifetime of the animal.
3. **Animal Parentage** are the subset of animal characteristics that relate to the sire, dam, ET donor and recipient dam, and rearing dam of the animal.
4. **Animal State** is the set of information that changes in response to events or management activities carried out on the animal. There are a variety of animal states, including fate (whether the animal is dead or alive), pregnancy and lactation states, fertility status (which can change to neuter) and current location and health status. Some systems may

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<sup>8</sup> NZ Namespace for URN is defined in RFC 4350 (<http://tools.ietf.org/html/rfc4250>)

choose not to interchange state explicitly but rather implicitly through a set of temporal observations.

5. **Group Membership** describes management groups to which animals belong (section 5).

The life data dictionary in Appendix A does not attempt to cover every possible application-specific field. For this reason, schemas that implement animal life data should allow for extensibility.

## 5 Groups of Animals

This section of the Standard defines how to represent a collective group of animals. Animals are grouped for many purposes, and often data is recorded on a group of animals as a whole rather than (or as well as) individuals. Groups may be defined and used for different purposes:

- A herd of animals may be recognised as a contemporary group for genetic analysis purposes, or as the entity at which control is exercised over animals for traceability purposes;
- A mob of animals is frequently used as an entity to which collective observations can be applied, for instance moving a mob of animals from one paddock to another, or drenching an entire mob of animals;
- A session is frequently used by on-farm data capture systems to describe the group of animals that were handled and measured at the same time (the group of cows present at milking or the group of sheep weighed and vaccinated together);
- Drafting Lists or Groups are provided to on-farm control equipment to allow animals to be automatically drafted into different pens by equipment that reads EID tags and controls gates; and
- Groups of animals are also defined for reporting and comparison purposes in farm management software.

This Standard does not define all methods by which groups of animals may be defined and used in software and electronic systems. It does define a mechanism by which information about a group of animals can be interchanged:

- Expressing the set of groups to which an animal belongs or has belonged in the past;
- Expressing the current members of a group;
- Identifying a group as a subject of an observation.

The attributes of a Group are listed in Appendix D.

## 6 Animal Observations

### 6.1 Observations and Sampling

For the purpose of this Standard, an observation is the act or instance of viewing or noting a fact or occurrence for some scientific or other special purpose. Thus an observation can include a note or record of an activity carried out, an event that has occurred, or a measurement taken.

The Open Geospatial Consortium describes observations<sup>9</sup> as involving “sampling of an ultimate feature of interest”. In geographic terms, many features can only be “sampled”. However, with animals and particularly groups of animals, “sampling” is an important concept. It may be that only a sample of the animals in a mob is weighed, or that a device takes a sample of the fat or protein in milk at a moment in time.

An observation itself does not represent “state”. Instead an observation records sampling of the state of an animal at a point in time. As a result, an observation will not tell you when an animal lactated – only that at a point in time it was observed lactating, or that lactation was observed to begin or end. Changes to animal state (section 4) may be *triggered by* an observation, but the observation does not represent the state itself.

### 6.2 The Subject of an Observation

For the purposes of this Standard, the subject of an observation may be an individual animal, or a collective set of animals (such as a mob, herd, group, or session).

For example, a weight may be recorded for an individual animal; a health treatment may be applied to an entire mob of animals (individually identified or not); or a movement may be recorded for a specific group of animals convened for that purpose (a session – see section 5).

As a result, an essential part of recording and transmitting any observation must be an identification of the animal or animals to which it applies.

Item Name	Description	Cardinality	Type & Validation
Animal ID	The identification of an animal as specified in section 3.	1	URN Identifier
Group ID	Identification of a collective group of animals, through a unique group identifier (see section 5).	1	URN Identifier
Group Members	Definition of a collective group of animals by listing their identities.	1..n	List of URN Identifiers

<sup>9</sup> OGC: Observations and Measurements – [www.opengeospatial.org/standards/om](http://www.opengeospatial.org/standards/om)

### 6.3 Date and Time of an Observation

All observations are observed or sampled at a point within time, so the record of an observation **SHALL** be accompanied by a date, or date and time.

Item Name	Description	Cardinality	Type & Validation
Observation Date	Date (and depending on observation, time) at which the observation was made. For some events, the time component of the observation is critical (for instance, a Milk Yield observation). For others, (such as condition score), the rate of change is slow enough that time is irrelevant.	1	ISO 8601 date (and time)

## Appendix A Animal Life Data Dictionary (Normative)

### A.1 Animal Characteristics

The following table defines items categorised as **Animal Characteristics** that do not change over the lifetime of the animal.

Item Name	Description	Data Type
Birth Date	The date on which an animal was born. <i>See also: Birth Date Confidence, Birth Year, Birth Cohort</i>	ISO 8601 Date
Birth Date Confidence	As birth date may not be known with absolute precision, this indicator specifies the confidence with which the date is known. The Birth Date Confidence Indicator is a variation on the Date Accuracy Indicator used by the Australian Institute of Health and Welfare <sup>10</sup> , adjusted to match the format of ISO dates (YMD). It is a 3 character string with positional characters representing Year, Month, and Day (YMD). Character values = A (accurate), E (estimated), U (unknown) (e.g. "AEU")	3 character string with positional characters representing Year, Month, and Day (YMD)
Birth Location	Location identifier that distinguishes the location at which the animal was born, using a URN-based identification string that contains the namespace and unique identifier within that namespace. An example for the MPI Farms Online system might be "nzl:farm:farmsonline:WK-3284-0046".	URN string
Birth Rank	A value describing the number of progeny born to the same dam in the same birth event; values are 0 if the animal is born dead, 1 if the animal is a singleton, 2 if it is one of twins, etc. Typical values are 0-5, or 0-2 for cattle. May be NULL if unknown.	Positive Integer, NULL if unknown.
Birth Cohort	The <i>contemporary group</i> or <i>cohort</i> that describes the season (spring/autumn) within the birth year into which animals are categorised. This is most likely derived or calculated from the birth date. As seasons vary around the world (including variations with 2, 4, 6, or 12 cohorts), a cohort number is used to interchange this data.	Integer cohort number (2 digits)

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<sup>10</sup> Date Accuracy Indicator – Australian Institute of Health and Welfare, <http://meteor.aihw.gov.au/content/index.phtml/itemId/294429>



Item Name	Description	Data Type
Birth Year	<p>The <i>contemporary group</i> or <i>cohort</i> for the year of birth into which animals are categorised. Known as <b>Year Born</b> in many systems.</p> <p>This is a derived field, calculated from the Birth Date where available. It is included here as some systems interchange this data.</p> <p>Note that in some occasional circumstances, this may be different by 1 from the year component of the birth date (e.g. an animal born early in the northern hemisphere or late in the southern hemisphere).</p>	Integer year (1900 to 2100 or a subset thereof).
Breed Assessed	<p>A visual assessment of the animal's primary or major breed. In many systems this is simply called "Breed".</p> <p>There is no internationally recognised master list of livestock breeds. ICAR mandates a list of codes for bovine semen straws<sup>11</sup>, and Oklahoma State University publishes a useful list of livestock breeds<sup>12</sup>. The UN Food and Agriculture Organisation (FAO) maintains a database of all domestic livestock breeds<sup>13</sup>. A list of breeds suitable for use with New Zealand farmed livestock will be maintained at <a href="http://www.farmdatastandards.org.nz">www.farmdatastandards.org.nz</a>.</p>	String based upon breed list.
Breed Distribution	<p>A two-dimensional matrix of breed identifiers and the proportion of each breed in the animal (calculated from its parent's breed components). SIL currently uses percentages, and the NZ Dairy Databases use 16ths. We have also seen systems use 64ths.</p> <p><i>See also: Breed Assessed.</i></p>	Breed (enumerations) and breed proportion (in terms relative to the Breed Distribution Denominator, "Sixteenths", "SixtyFourths", or "Percentage")
Breed Distribution Denominator	The basis for the proportion of each breed expressed in the Breed Distribution.	Enumeration: 16, 64, 100
Visual Colour	The colour of the animal	String
Sex	The gender or sex of the animal. This may be combined with state information to indicate the fertility status of the animal.	Enumeration (Male, Female)

<sup>11</sup> ICAR Guidelines 2012, *Section 8 Annex 1, Breed Codes on Bovine Semen Straws for International Trade assigned by ICAR Sub-committee Interbull*, International Committee for Animal Recording.

<sup>12</sup> Oklahoma State University Livestock Breeds, <http://www.ansi.okstate.edu/breeds/>.

<sup>13</sup> FAO Domestic Animal Diversity Information System, <http://dad.fao.org/>

Item Name	Description	Data Type
Species Binomial Name	Combines Genus and Species (e.g. “Bos taurus” for cattle, “Ovis aries” for sheep, “Cervus elaphus” for red deer, “Cervus Canadensis” for elk wapiti, and “Capra aegagrus” for goats)	String with common values. Only Genus is capitalised.
Species Common Name	Describes the species in common terms (“Cattle”, “Deer”, “Goats”, “Sheep”)	Enumeration: Cattle, Deer, Goats, Sheep

## A.2 Animal Parentage

The following table defines items categorised as **Parentage**, and which link animals genetically. As with animal characteristics, these do not change over the lifetime of the animal but may become better known (for instance, as the result of a DNA test).

Item Name	Description	Data Type
Animal ID	Identification of the parent using one of the accepted forms of animal identification.	String – animal identification.
Parent Age	The calculated age of the parent in years at the time at which the animal was born (based on the birth date or birth year of the animal and the birth date or birth year of the parent). This is used as “Age of Dam”, an adjustment factor in some systems.	Null if unknown, or integer values 1 to 25
Parent Type	This specifies the type of parentage that is claimed: <ul style="list-style-type: none"> <li>• Dam (natural dam)</li> <li>• ET Recipient Dam</li> <li>• ET Donor (Genetic) Dam</li> <li>• Rearing Dam (reared, but did not give birth to the progeny)</li> <li>• Sire (multiple sire records may be recorded, each with its own DNA probability if DNA testing indicates multiple matches)</li> <li>• Excluded Sire (unable to confirm the sire, but definitely not this animal).</li> </ul>	Enumeration

Item Name	Description	Data Type
Parentage Method	Documents how parentage was assessed: <ul style="list-style-type: none"> <li>• Observed (e.g. Dam observed giving birth to progeny)</li> <li>• Associated (e.g. Dam seen feeding progeny)</li> <li>• Derived (e.g. Sire derived from mating records)</li> <li>• DNA (the result of a DNA parentage test)</li> </ul>	Enumeration: Observed, Associated, Derived, or DNA.
DNA Probability	The calculated likelihood or degree of probability resulting from DNA test analysis <sup>14</sup> .	Floating point percentage
DNA Data Quality		Floating point number
DNA Reliability		Floating point percentage

### A.3 Animal State

The following table defines **Animal State** items that may change over the lifetime of the animal. Some items change many times, while others may only change once. All animal states could be adequately represented as the result of a set of observations, and hence it would be technically possible to do without state information. However, the ability to interchange state information is important because:

- Many systems, particularly field devices, need to display or act on state information, without having the storage space or processing power to manage all events that resulted in that state; and
- In some data sets (particularly older data), the actual observations that drove a state change are not available (for example, the date on which a male sheep was wethered is unknown), so the current state is the only available representation.

Item Name	Description	Data Type
Current Location	Location identifier that describes the current location at which the animal is living, or the last location at which it was alive, using a URN-based identification string which contains the namespace and unique identifier	URN String

<sup>14</sup> E.g. Dodds, K. G., M. L. Tate, and J. A. Sise. 2005. Genetic evaluation using parentage information from genetic markers. *Journal of Animal Science*, vol 83 no 10, 2271-2279; and Marshall, T. C., J. Slate, L. E. B. Kruuk, and J. M. Pemberton. 1998. Statistical confidence for likelihood-based paternity inference in natural populations. *Mol. Ecol.* 7:639-655.

Item Name	Description	Data Type
	within that namespace. An example for the MPI Farms Online system might be “nzl:farm:farmsonline:WK-3284-0046”.	
Disposal Method	Indicates the disposal method for an animal that is dead. This may be Null if the animal is alive or disposal method is unknown.	Enumeration: Home Kill, Disposed at NAIT Location, Meat processor – human consumption, Meat processor – pet food, Rendering facility.
Fate	Also known as “Status”, this field is typically used to describe if the animal is Alive or Dead, sometimes with other variants such as Culled and Sold, although these may be more problematic if exchanging details between systems (for instance, sold on one system, but arriving and alive on another system). The reason for the Fate (for instance, culled) should be recorded as an observation.	Enumeration, values include Alive, Dead, In Transit
Fertility Status	Indicates whether an animal is known to be fertile or not, or whether it has been partly or fully neutered. For instance, a neutered cattle male is a steer, a neutered sheep male is a wether. Females of both species can be spayed. An infertile male by comparison still has testes and responds as a male, and is frequently used as a “teaser”.	Enumeration: Unknown, Fertile, Infertile, Neutered, Cryptorchid
Lactating	Indicates whether the animal is lactating at the time of data transfer. Note that this state may change a number of times over an animal’s lifetime.	Boolean: True or False, or may be Null if unknown.
Rearing Rank	Rearing rank is used to indicate the number of progeny reared by the same dam during the same lactation as this has an influence on weights and growth rates. For example, an animal reared as a twin will have a rearing rank of 2. May be Null if unknown, or 0 if born dead.	Integer: Null or values 0 to 12.
Reproductive Status	Indicates whether the animal is pregnant at the time of data transfer. Note that this state may change a number of times over an animal’s lifetime.	Enumeration: Unknown, Cycling, Not Cycling, Pregnant, Involuting
Status Date	Date the status or fate last changed	ISO Date; May be Null
Withholding Date Meat	Due to health treatments, the animal may not enter the food supply chain until this date. Derived from health treatment events.	ISO Date; May be Null
Withholding Date Milk	Due to health treatments, milk from the animal may not enter the food supply chain until this date. Derived from health treatment events.	ISO Date; May be Null

Item Name	Description	Data Type
Withholding Date Export	Date resulting from export slaughter interval of a treatment.	ISO Date; May be Null

## A.4 Group Membership

The following table defines **Group Membership**, which allows management or organisation of animals in groups. It is recommended that only current group memberships SHOULD be interchanged as animal data, and that historical uses of groups (for instance, mobs) SHOULD be reflected in animal observations and events.

See also *Appendix D, Attributes of a Group*.

Item Name	Description	Data Type
Group Location	Location identifier to which the group belongs. An animal that is grazing off at another farm may have groups on both the owning and grazing farms.	Data type to be determined, most likely NAIT Location.
Group Name	Name of the group within the location.	Text
Group Type	Distinguishes between a physical management group (a mob of some sort) and other sorts of groupings such as a logical group of animals for analysis, or a planned group (a draft list).	Enumeration: Physical, Logical, Planned

## Appendix B Animal Observations Data Dictionary (Normative)

### B.1 Observations

This data dictionary SHALL be used for observations. The following table identifies the distinct types of observation (along with some of their alternative names or descriptions).

Category	Observation	Notes and other names	Attributes or Fields	Data Types and Notes
Registration	Register Identification	Also called “Tagging”; the act of applying an official tag. Applies to individual animals.	Tag Type	Enumeration: <i>see Appendix B.2</i>
			ICAR Product Code	Integer: Product code from <a href="http://www.service-icar.com/manufacturer_complete.php">http://www.service-icar.com/manufacturer_complete.php</a>
			Animal Identifier	URN – an animal identifier as per the Animal Identification proposal.
			Removing Tag	Boolean: True if the tag is being removed – the default is False.
	Change Identification	The act of replacing an official tag, also called “Retagging” and “Replacement”. Applies to individual animals.	Previous Animal Identifier	Where known, the previous URN of the animal.
			Tag Type	Enumeration: <i>see Appendix B.2</i>
			ICAR Product Code	Integer: Product code from <a href="http://www.service-icar.com/manufacturer_complete.php">http://www.service-icar.com/manufacturer_complete.php</a>
			Animal Identifier	The new URN of the animal
			Retagging Reason	String – a textual explanation
	Change Fate	Records that the animal Fate (or Status) has changed. This typically occurs when an animal dies or leaves the herd.	Fate Code	Enumeration: <i>see Appendix B.3</i>
			Fate Reason	Enumeration: <i>see Appendix B.4</i>
			Disposal Waybill	String – Waybill or disposal identifier

			Disposal Method	Enumeration: <i>see Appendix B.5</i>
	Change Herd Membership	The act of changing from one “herd” (including flock), or other official recording group to another. May comprise part of a movement. Applies to individuals or a group. Also called sale, purchase, transfer.	Source Herd Identifier	URN string – Herd identifier
			Source Herd Display Name	String – display name
			Destination Herd Identifier	URN string – Herd identifier
			Destination Herd Display Name	String – display name
	Change Ownership	Records a change of ownership of an animal, group, or herd. Often (but not always) associated with a movement between locations. This may also include a Lease (a change of ownership arrangements). Also called sale, purchase, transfer.	Previous Owner Identifier	URN string – Owner identifier
			Previous Owner Display Name	String – display name
			New Owner Identifier	URN string – Owner identifier
			New Owner Display Name	String – display name
			Previous Lessee Identifier	URN string – Owner identifier
			Previous Lessee Display Name	String – display name
			New Lessee Identifier	URN string – Owner identifier
			New Lessee Display Name	String – display name
			Tally	Integer – count of animals involved
	Change Location	A movement from one official location to another. We have called this “Change Location” rather than Movement to avoid confusion with moves within a location (for instance, between paddocks). Also called movement, transfer, grazing, sale, or purchase. Recorded for individuals for cattle and deer because of NAIT requirements.	Source Location Identifier	URN string – location identifier
			Source Location Display Name	String – display name
			Destination Location Identifier	URN string – location identifier
			Destination Location Display Name	String – display name
			Transport Method	Enumeration: <i>see Appendix B.6</i>
Transport Operator			String – operator name	

Reproduction			Waybill	String – waybill or transaction ID
			Vehicle Identification	String – fleet number or licence plate
			Transit Time	ISO 8601 period (duration)
			Tally	Integer – count of animals involved
	Run with Sires	Records that a female (or group of females) was run with one or more sires for the purpose of mating, but is not an observation of actual mating. The observation date is the start of running the sires and dams together.	Sire Identifier(s)	A list of URN animal identifiers for the sires, if these are known.
			Sire Tally	Integer: the number of sires
			Dam Tally	Integer: the number of dams
			Dam Ratio	Float: the ratio of dams per sire
			Teaser Used	Boolean: True if a teaser was used
			Intended Exit Date	ISO 8601 date of intended separation of sires and dams.
	Observed Mating	Record of a mating that was observed, which might include observed natural mating, artificial insemination, and AI with sexed semen (all differentiated by Mating Method).	Mating Method	Enumeration: Natural, AI, Sexed Semen AI
			Artificial Insemination Sire Identification	URN animal identifier of sire May be called Bull Identification
			Straw Identifier	String – identifier of the straw. ICAR identifier preferred.
	Embryo Transfer	The act of implanting a fertilised embryo, typically from another donor.	Embryo Donor Identification	URN animal identifier of the dam from whom oocytes were harvested.
Embryo Sire Identification			URN animal identifier of the sire.	
Embryo Recipient Identification			URN animal identifier of the recipient dam	
Embryo Implant Serial Number			String – identifier of the embryo.	
Egg Collection		Collection Identifier	String – collection identifier	



		The act of collecting oocytes or eggs from a donor dam.	Collection Centre Identifier	String – identifies the collection centre
			Oestrous Day	Integer – day within oestrous cycle
	Pregnancy Scan	Also called “scanning” (although that term could refer to other scans), this is the process of determining pregnancy, and possibly the number of foetuses and foetal age. In the case of sheep, short scanning identifies empty, single, and multiple, rather than counting all multiple embryos.	Scan type	Enumeration – Short, Long
			Equipment Model	String – make and model of equipment used
			Foetus Count	Integer – number of foetuses (may be zero).
			Foetal age	Integer – gestation age in days where estimated.
	Semen Collection	The act of collecting semen from a sire.	Collection Identifier	String – collection identifier
			Collection Centre Identifier	String – identifies the collection centre
			Semen pH	Float: values between 3 and 9
			Semen Volume	Float: The volume of semen in millilitres (ml)
			Semen Motility	Float:
			Forward Progression	String: score from 0 to 4, with + or – postfix.
			Semen Concentration	Float: expressed as 10 <sup>6</sup> /ml
			Semen Morphology	Float: Percentage of sperm with normal morphology
			White Blood Cell Count	Float: expressed as 10 <sup>6</sup> /ml
Parturition	Also called Birthing, this is a cross-species term for calving, lambing, or fawning.	Parturition Actual Date Indicator	Enumeration: actual, estimated	
		Abnormal Birth Indicator	Enumeration: aborted, induced, premature	

			Assistance Indicator	Enumeration: not reported, reported no assistance, minor assistance, major assistance
			Number of Progeny	Integer: Count of progeny.
			Progeny Number	Integer: Ascending number allocated to each progeny recorded within a parturition observation.
			Fate of Progeny	Enumeration: <i>see Appendix B.3.</i> (for each progeny recorded within a parturition observation)
			Progeny Animal ID	URN animal identification of each progeny where this has been recorded during a parturition observation
			Progeny Sex	Enumeration: Male, Female (for each progeny recorded within a parturition observation)
			Progeny Comment	Enumeration: <i>see Appendix B.7</i>
Feed and Growth	Liveweight	A weight recorded on a live animal (as opposed to dead weight). Abbreviated “Weight” in many on-farm tools.	Weight	Float: Weight in kg
			Equipment Model	String: Make, model, version used
			Precision	Integer: ± %
			Coefficient of Variation	Float: Percentage (for a group)
			Maximum Weight	Float: Weight in kg (for a group)
			Mean Weight	Float: Weight in kg (for a group)
			Minimum Weight	Float: Weight in kg (for a group)
			Standard Deviation	Float: in kg (for a group)

		Time off feed	ISO 8601 period (hours/minutes)
Weaning	The act of removing young animals from being able to access milk. This causes a change in diet.	Pre-weaning Group	Group identifier (URN String)
Progeny Weaned	Removing progeny from the dams causes a change in demand and feeding regime for the dams.	Pre-weaning Group	Group identified (URN String)
		Number Weaned	Integer count of progeny weaned
Feed Regime Change	Records a change in a feed regime (for instance, onto or off a forage, or use of a supplementary feed). Often recorded for a group of animals.	Feed Category	Enumeration from Appendix B.8
		Feed Name	Enumeration: <i>see Appendix B.8</i>
		Crude Protein	Float: amount of total protein which can be metabolised from consuming the feed; kg/kg DM
		Digestibility	The percentage of feed that is able to be digested
		Metabolisable Energy	Float: MJ ME/kg DM
		Feed Allowance Per Head	Float: kg DM per head
Change Paddock	Also called “internal move” or “grazing” by some systems, this is a record of movement of an animal or group from one internal farm location (a paddock) to another. This is often recorded for a group of animals.	Source Paddock	String, Identifier of the paddock from which animals were being moved
		Residual Pasture Cover	Float: kg DM/hectare remaining in source paddock
		Destination Paddock	String, Identifier of the paddock into which animals were being placed
		Destination Pasture Cover	Float: kg DM/hectare in destination paddock when animals are changed
		Tally	Integer – count of animals involved

	Draft	Records that an animal was drafted in a certain direction (out a gate) or moved to another group.	Gate or Group	
	Body Measurements	Records miscellaneous measurements made on an animal	Measurement Type	Enumeration: Hip Height, Scrotal Circumference
			Measurement	Floating:
			Measurement Units	Enumeration: mm, cm, m
Animal Health	Diagnosis	The diagnosis of a health condition. ICAR provides a detailed document about diagnosis of health conditions.	Diagnosed By	String: name of person
			Role Diagnosed By	Enumeration: Veterinarian, Farmer, Technician
			Affected Part	Enumeration: Body part or system affected, coded using ICAR diagnosis coding system <sup>15</sup> .
			Disease Category	Enumeration: <i>see Appendix A.1</i>
			Disease	String: name of the disease
			Disease Code	Enumeration: using ICAR diagnosis coding system <sup>15</sup> , <i>see Appendix A.1</i>
	Disease Strain	String		
	Treatment	A record of a health treatment applied (for instance, medication, vaccination, drenching or dipping).	Treated By	String: operator who applied the health treatment
Health Product			String: trade name of the health product	

<sup>15</sup> [International Agreement of Recording Practices](#), Guidelines approved by the General Assembly of the International Committee for Animal Recording – ICAR, June 2012.

			Registration Number	String: ACVM registration number of product <sup>16</sup>
			SKU	Integer: stock keeping code (barcode)
			Organic Approved Remedy	Boolean: True if organic approved – the default is False.
			Treatment Method	Enumeration: <i>see Appendix B.10</i>
			Batch Number	String: batch number of product used
			Expiry Date	Date: Expiry date of batch
			Dose Rate	Float: dose that was administered
			Dose Units	Enumeration: ml, mg; units of the amount administered
			Withholding Period Meat	Integer: days
			Withholding Period Milk	Integer: days
			Export Slaughter Interval	Integer: days; minimum time between treatment and slaughter for export markets
			Hormone Indicator	Flag (True/False): indicates that the product applied contains a hormone growth promotant
Farming Procedure	A record of a routine farming procedure performed (for instance, dehorning, shearing, crutching, disbudding or castration)	Procedure Type	Enumeration: <i>see Appendix B.11</i>	
		Procedure Method	String:	
Surgery	A record of surgery performed, especially for major surgery	Surgery Procedure	Enumeration: <i>see ACVS list of Surgical Procedures</i> <sup>17</sup>	

<sup>16</sup> [Search the ACVM Register](#) or view the [entire register](#), Ministry for Primary Industries Online

<sup>17</sup> [Surgical Procedures](#), American College of Veterinary Procedures, 2012

			Surgery Part	Enumeration: Body part or system affected, coded using the 2 <sup>nd</sup> level of the ICAR diagnosis coding system <sup>15</sup> .
			Surgery Outcome	String:
	Injury	Records an injury event	Injury Type	Enumeration: Accident, Misadventure
			Affected Part	Enumeration: Body part or system affected, coded using the 2 <sup>nd</sup> level of the ICAR diagnosis coding system <sup>15</sup> .
Injury Comment			String: description of injury	
Tests (excluding Dairy Herd Tests)	Blood tests	Records details of blood tests	Blood Test Type	Enumeration: <i>see Appendix B.12</i>
			Blood Test Result	Floating:
			Blood Test Units	Enumeration: %, x10 <sup>3</sup> /μL, x10 <sup>6</sup> /μL, x10 <sup>9</sup> /μL, mg/dL, g/dL, g/L
	Liver Biopsy	Records details of liver tests	Liver test type	Enumeration: <i>see Appendix B.13</i>
			Liver Test Result	Floating:
			Liver Test Units	Enumeration: U/L, mg/dL, g/dL
	CT-scan	Records details of CT-scan	To be developed*	
	MIR	Records details of MIR scan	To be developed*	
	Gene sample	Records details of DNA tests	DNA Test Type	Enumeration: <i>see Appendix B.14</i>
			DNA Test Sample Type	Enumeration: <i>see Appendix B.14</i>
Recessive Gene condition			String:	
DNA Test Result			String:	
Dairy Production	Milking	Records that an animal was present at milking and was milked.	Present at milking	Flag (True/False)
			Milked	Flag (True/False)

	Milk Yield	Records the yield of milk from an animal at a single milking.	Measurement Method	Enumeration: device or process used to measure milk yield
			Yield Precision	Float: degree of precision of the measurement
			Yield (Litres)	Float: milk yield in litres
	Drying Off	Also called “End Lactation”, this marks the point from which an animal will no longer be milked in the current lactation. It may also be accompanied by animal health treatments.	Drying Off Reason	Enumeration: <i>see Appendix B.15</i>
			Lactation End Date	Date
	Milk Characteristics	Captures characteristics of an animal’s milk (for instance, from a herd test or inline). Recorded against individuals.	Milk Measurement Method	Enumeration:
			Sample Identifier	String: identifier of sample sent away for processing
			Laboratory Identifier	String: unique identifier for the laboratory that processed the sample
			Fat Percentage	Float: percentage of fat in milk
			Protein Percentage	Float: percentage of protein in milk
			Lactose Percentage	Float: percentage of lactose in milk
			Somatic Cell Count	Float: recorded in thousands of cells per ml of milk and is taken at each herd test (i.e., actual cell count divided by 1000)
	Conductivity	Float: Conductivity of the milk in mS/cm		
Herd Test	Records that a milking monitored as part of an occasional (batch or DSM) herd test occurred. Must be recorded against	Milking Number	Integer: indicates the number of the milking within the herd test (for instance, the first or second milking)	

		individuals.  <i>Herd Test observations have been normalised against the requirements of the Dairy Herd Testing Standards (NZS8100) and the Dairy Industry Good Animal Database (DIGAD), as NZ dairy herd testing is required to use this mechanism.</i>	AM/PM Indicator	Enumeration: am, pm; Indicates whether the milking measured represents a morning or afternoon milking using traditional batch milking methodology
			Pretest Milking Date Stamp	ISO 8601 date (and time): the date and time of the immediate previous milking, in herd tests.
			Milking Interval	Integer: in distributed milking systems the time between this observation and the previous milking; hours
			Herd Test Valid Indicator	Integer: 0 = valid, 1 = not valid
			Sample Regime Type Code	Integer: 1 = twice a day (am &pm), 2 = single sample-AM (>= 2 milkings), 3 = single sample-PM (>= 2 milkings), 4 = once a day
			Average Number of Milkings	Float: average number of times that an animal is milked expressed in terms of a 24-hour period at the time of the herd test sample milking
			Abnormal Test Type Code	Enumeration: <i>see Appendix B.16</i>
			Sample Identifier	String: Identifier of sample sent away for processing
Meat Production	Dead Weight	Weight of an animal before cutting	Dead Weight	Float: weight of an animal in kg before cutting



	Carcass Characteristics	Grading, carcass weight, and other characteristics.	Hot Carcass Weight	Float: carcass weight in kg of an animal prior to boning out in a hot boning plant, or prior to chilling
			GR Fat Depth	Float: depth of fat in mm at the GR measurement site
			Fat Grade	Enumeration: species-specific coding of fat grade at plant
			Conformation Grade	Enumeration: species-specific coding of conformation at plant
			Faults	Enumeration: <i>see Appendix B.17</i>
			Fault Locations	Enumeration: Body part or system affected, coded using ICAR diagnosis coding system <sup>18</sup> .
			Meat Colour	Integer: from 1 (pink) to 7 (dark maroon)
			Fat Colour	Integer: from 1 (pure white) to 7 (creamy yellow)
			EMA Ultrasound	Float: Eye Muscle Area Ultrasound; in cm <sup>2</sup>
			Eye Muscle Dimension A	Float; mm
			Eye Muscle Dimension B	Float; mm
			Eye Muscle Dimension C	Float; mm
			pH	Float: pH measurement
			Processor	String: meat processor ID or name

<sup>18</sup> [International Agreement of Recording Practices](#), Guidelines approved by the General Assembly of the International Committee for Animal Recording – ICAR, June 2012.

			Plant	String: ID or name of plant where animal is killed
			Mob ID	String: unique identifier that represents the line of animals being killed
			Carcass ID	String: identifier assigned to carcass by processor
			Dentition	Enumeration: <i>see Appendix B.18</i>
Fibre Production	Shearing	Record of the fact that an animal was shorn, and optionally, fleece weight and lab sample ID.	Fleece Weight	Float: weight of the shorn fleece in kilograms
			Sample Identifier	String: identifier of sample sent away for processing
	Fibre Measurements	Laboratory measured fibre characteristics.	Sample Identifier	String: identifier of sample
			Laboratory Identifier	String: unique identifier for the laboratory which processed a sample
			Yield Percentage	Float: yield of clean fibre
			Staple Length	Integer: the length of wool staple in mm from a wool laboratory test
			Mean Fibre Diameter	Float: mean diameter of fibres in the sample in micrometres (microns)
			Fibre Diameter Standard Deviation	Float: the standard deviation of diameter of fibres in the sample
			Fibre Diameter Coefficient of Variation	Float: the coefficient of variation of diameter of fibres in the sample
Spinning Fineness	Integer: measure or score of the fineness of wool for spinning, from a lab test			

			Prickle Factor	Integer: measurement or score of the prickle factor of wool, from a lab test
			Comfort Factor	Integer: score of the comfort level of a wool from a testing laboratory
Velvet Production	Velvet Measurements <sup>19</sup>	Record of velvet production measurements	Velvet ID	String: velvet identification tag
			Velvet Antler Measured	Enumeration: Left, Right, Combined
			Velvet Weight	Float: total velvet weight in kg;
			Velvet Circumference	Float: the lesser measurement of the circumference of the beam measured on the clear beam: immediately above the trez tyne; and midway between the top of the stick and the top of the inside cut; in cms
			Velvet Top Length	Float: Measured between top of the stick and bottom of the fork where the trez meets the beam; in cms
			Velvet Overall Length	Float: measured from the top of the stick to the top of the inside cut; in cms
			Velvet Category	Enumeration: <i>see Appendix B.19</i>
			Velvet Grade	Enumeration: <i>see Appendix B.20</i> SA, A, B, C, D, E, OG1, OG2, OG3, RG, HV, HA, SP, TW, Dam, Manufacturing
Scores	Condition		Score	Integer: score 1-9;

<sup>19</sup> [New Zealand Industry Agreed Velvet Grading Guidelines](#), Deer Industry New Zealand, September 2013

		A category scale score of the fatness or condition of an animal	Condition Score Event	Enumeration: pre-parturition, pre-mating, mating, weaning, not specific
	Overall Conformation		Score	Integer: score 1-5;
	Footrot		Score	Integer: score 1-5;
	Teeth		Score	Integer: score 1-5;
	Daggy		Score	Integer: score 1-5;
	Mothering		Score	Integer: score 1-5;
	Vigour		Score	Integer: score 1-5;
	Udder		Score	Integer: score 1-5;
	Farmer Opinion Traits	Traits relating to their adaptability to milking, shed temperament, milk speed and overall opinion of two-year-old heifers	Farmer Opinion Trait	Enumeration: <i>see Appendix B.21</i>
			Score	Integer: score 1-9;
	Conformation	Traits relating to the physical conformation of two-year-old heifers	Conformation Trait	Enumeration: <i>see Appendix B.21</i>
			Score	Integer: score 1-9;
	Udder Conformation	Traits relating to the udder conformation of two-year-old heifers	Udder Conformation Trait	Enumeration: <i>see Appendix B.21</i>
			Score	Integer: score 1-9;

## *B.2 Animal Tag Types*

Animal Tag Type is used in the **Register Identification** and **Change Identification** observations in the Registration category. Valid values for **Tag Type** are:

Ear Tag

Inject

Bolus

Tag Attachment

Note that Tag is a synonym for Ear Tag.

## *B.3 Animal Fate Values*

Animal Fate is specified in both the **Change Fate** observation (in Registration) and for progeny in the **Parturition** observation (in Reproduction). Some codes are specific to one of these observations.

The relevant context for each code is given below.

Valid values for **Fate Code** are:

<b>Fate Value</b>	<b>Used in observation(s):</b>
Alive	Change Fate
Culled	Change Fate; Parturition
Dead	Change Fate; Parturition
Grazing Off	Change Fate
Grazing On	Change Fate
Lost	Change Fate
Sold	Change Fate; Parturition
In Transit	Change Fate
Reared	Parturition
Bobbied	Parturition

## *B.4 Animal Fate Reasons*

Fate Reason is used in the **Change Fate** observation in the Registration category.

Valid values for **Fate Reason** are:

AB proof not up to standard

abortion

blind quarter	high somatic cell count
bloat	humane – injury
brucellosis	humane – sickness
BVD	IBR
calving trouble (including septicaemia)	infertility or poor fertility
cancer	injury or accident
Caprine Arthritis Encephalitis	Johne’s Disease
cast	ketosis
catarrh	lame
cull to layoff	late calver
culled/died sickness or disease	leptospirosis
died – cause unknown	listeriosis
dried off	low libido – poor service behaviour
drowned	low production
EBL	magnesium staggers
eczema	mastitis
electrocution	milk fever
empty	natural proof below standard
export	old age
facial eczema	other causes
failed parentage test	other diseases
failed veterinary examination	other metabolic disease
feet or leg problems	parent performance
heritable defect in dam	physical defect in sire
heritable defect in progeny	physical in progeny
heritable defect in sire	pneumonia
hermaphrodite	progeny test below standard

rye grass staggers	TOP conformation
salmonella	TOP management
scours	traits other than production
semen quality	tuberculosis
sire's proof below standard	udder breakdown
slaughter	undershot jaw
slow milker	unknown
spring eczema	unsatisfactory or non-server
store	unsuitable temperament
sucker	unsuitable type
surplus to requirements	unsuitable udder/teats
teeth	weight gain below standard
three teater	

### *B.5 Animal Disposal Methods*

Disposal Method is used in the Change Fate observation in the Registration category.

Valid values for **Disposal Method** are:

- Home Kill
- Disposed on site
- Meat processor – human consumption
- Meat processor – pet food
- Rendering facility

### *B.6 Transport Methods*

Transport Method is used in the **Change Location** observation in the Registration category.

Valid values for **Transport Method** are:

- Herding
- Road Transport
- Rail Transport

Source Own Transport

Destination Own Transport

## *B.7 [Dairy] Progeny Comment*

Progeny Comment is used in the Parturition observation in the Reproduction category.

Valid values for **Progeny Comment** are:

aborted	mulefoot
born dead – birthing difficulty	mummified
bowel or intestine abnormality	other deformity – extra/missing limbs
brain damaged/retarded/spastic	paralysed legs
breathing difficulties	polled
cleft palate	premature
complex vertebral malformation	red factor
died after 4 days	scours
died not due to birthing	short jaw
died within 1-4 days	spinal deformity
difficult to rear won't drink	still born
estimated birth date	swollen joints
extra teats	tail deformity/no tail
hernia	too large
induced	twisted feet
malpresentation/breech	weak and/or small

## *B.8 Feed Names*

Feed Name is used in the **Feed Regime Change** observation in the Feed and Growth category.

Valid values for **Feed Name** are:

Apple pomace	Barley Straw
Baleage	Brewers grains
Barley	Broll



Carrots	Pea Straw
Fishmeal	Potato
Hay	Proliq
Kale	Silage
Kiwifruit	Soya Bean Meal
Lucerne	Swedes
Maize Grain	Tallow
Maize Silage	Tapioca
Molasses	Turnips
Oats	Urea
Palm Kernel Extract	Wheat
Pasture	Wheat Straw
Pea	

## B.9 Disease Coding

The International Committee for Animal Recording (ICAR) have published *International Agreement of Recording Practices* available at

[http://www.icar.org/Documents/Rules%20and%20regulations/Guidelines/Guidelines\\_2012.pdf](http://www.icar.org/Documents/Rules%20and%20regulations/Guidelines/Guidelines_2012.pdf).

Section 16, *Guidelines for Recording, Evaluation and Genetic Improvement of Health Traits* describes the recording of health information in dairy cattle. Appendix 16 lists the comprehensive set of codes with up to 6 levels.

These **Disease Codes** are used in the **Diagnosis** observation in the Animal Health category.

The top level of the ICAR codes are specified here as **Disease Category** and are used in the **Diagnosis** observation in the Animal Health category.

Valid values for **Disease Category** are:

organ diseases	infectious diseases
reproduction disorders in females	parasitoses
reproduction disorders in males	metabolic diseases and deficiencies

poisoning

behavioural disorders and general findings

health-related information not representing diagnoses

### *B.10 Treatment Method*

Treatment Method is used in the **Treatment** observation in the Animal Health category.

Valid values for **Treatment Method** are:

Capsule

Dip

Oral Drench

Feed additive

Pour-on

Topical

Vaccine

### *B.11 Procedure Type*

**Procedure Type** is used in the **Farming Procedure** observation in the Animal Health category.

Valid values for **Procedure Type** are:

Branding

Castration

Crutching

Cryptorchiding

Dehorning

Disbudding

Shearing

Tailing

### *B.12 Blood Test Type*

Blood Test Type is used in the **Blood Tests** observation in the Tests (excluding Herd Tests) category.

Valid values for **Blood Test Type** are:

 $\beta$ -hydroxybutyrate

glucose

non-esterified fatty acid

urea-nitrogen

albumin

globulin

magnesium

inorganic phosphate

copper	vitamin E
GSHPx	leptospira
calcium	BVD
thyroxine T4	IBR antibodies
vitamin A	PII
vitamin B12	

### *B.13 Liver Test Type*

Liver Test Type is used in the **Liver Biopsy** observation in the Tests (excluding Herd Tests) category.

Valid values for **Liver Test Type** are:

alanine transaminase (ALT)	blood-urea-nitrogen (BUN)
aspartate transaminase (AST)	copper
alkaline phosphatase (ALKP)	cobalt
total bilirubin (Tot BILL)	selenium
albumin (ALB)	

### *B.14 DNA Tests*

The **Gene Sample** observation in the Tests (excluding Herd Tests) category uses the following:

Valid values for **DNA Test Type** are:

Carrier of Recessive Gene	marker-assisted selection
DNA match	pedigree verification
Identity	sire/dam match

Valid values for **DNA Test Sample Type** are:

blood	semen
hair	tissue
milk	

### *B.15 Drying Off Reason*

Drying Off Reason is used in the **Drying Off** observation in the Dairy Production category.

Valid values for **Drying Off Reason** are:

eczema	mastitis
end lactation	other causes
injured	other diseases
farm management	sick

### *B.16 Abnormal Dairy Herd Test Type Code*

Abnormal Test Code is used in the **Herd test** observation in the Dairy Production category.

Valid values for **Abnormal Test Code** are:

1	insufficient sample	6	irregular milk volume
2	farm anomaly	7	animal running with calves
3	animal in season	8	animal sick
4	animal held milk	9	contaminated sample
5	herd tester processing anomaly	10	meter faulty

### *B.17 Carcass Faults or Defects*

Fault is used in the **Carcass Characteristics** observation in the Meat Production category.

Valid values for **Fault** are:

#### **Disease**

Actino	GIT Peritonitis
C.Ovis	Infarcts
Condemned part	Liver fluke
Endocarditis	Lympho
Enteritis	M. Bovis
Epicarditis Pericarditis	Melanosis
GIT Neoplasm	Neoplasm

Nephritis

Sarco-Cysts

Peritonitis

Septicaemia

Pluck CLA

Xanthosis

Pneumonia

Other

Pyogenic lesions

### **Bruising**

Bruising

Dog bite

Wounds & Bruising

### **Other Faults**

Arthritis

Pleurisy

## *B.18 Dentition*

Dentition is used in the **Carcass Characteristics** observation in the Meat Production category.

Valid values for **Dentition** as used by meat processors are:

### **Sheep**

Lamb

Mutton

### **Cattle**

Two-tooth

Four-tooth

Six-Tooth

Full mouth

## *B.19 Velvet Category*

Velvet Category is used in the **Velvet Measurements** observation in the Velvet Production category.

Valid values for **Velvet Category** are:

Super A	Hard Velvet
Short	Hard Antler
Medium	Spiker
Long Top	Taiwan
Overgrown	Damaged
Regrowth	Manufacturing

## *B.20 Velvet Grade*

Velvet Grade is used in the **Velvet Measurements** observation in the Velvet Production category.

Valid values for **Velvet Grade** are:

SA	OG1	SP
A	OG2	TW
B	OG3	Dam
C	RG	Manufacturing
D	HV	
E	HA	

## *B.21 Score Trait Types*

There are a number of score traits relating to two year-old heifers, scored as integers in the range 1-9. These are specified in the Scores category.

**Farmer Opinion Traits** relating to the adaptability to milking, shed temperament, milk speed and overall opinion of two-year-old heifers

Adaptability to milking	How soon the heifer settled into the milking routine after calving (Slowly to Quickly)
Shed temperament	Temperament of the heifer in the farm dairy while being handled (Nervous to Placid)
Milking speed	Milking speed of the heifer (Slow to Fast)

Overall opinion	Farmer's overall acceptance of the heifer as a herd member (Undesirable to Desirable)
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**Conformation Traits** relating to the physical conformation of two-year-old heifers.

Stature	Height of cow at the shoulders (Short to Tall)
Capacity	Depth and width of chest and body in relation to the physical size of the heifer (Frail to Capacious)
Rump angle	Angle between the centre of the hips and the top of the pins (Pins high to Pins low)
Rump width	Width of pins, hips and thurls relative to the size of the heifer (Narrow to Wide)
Legs	Straightness or curvature of the back legs while the heifer is walking (Straight to Very Curved)

**Udder Conformation** Traits relating to the udder conformation of two-year-old heifers.

Udder support	Strength of the suspensory ligament and the udder depth relative to the hocks (Weak to Strong)
Front udder	Attachment of the front udder to the body wall (Loose to Strong)
Rear udder	Height and width of the rear udder attachment (Low to High)
Front teat Placement	Placement of the front teats relative to the centre of the quarters (Wide to Close)
Rear teat Placement	Placement of the rear teats relative to the centre of the quarters (Wide to Close)
Udder overall	Desirability of all traits related to the udder (Undesirable to Desirable)
Dairy conformation	Desirability of all traits pertaining to dairy conformation (Undesirable to Desirable)

## Appendix C Animal Identifiers used in New Zealand (Informative)

### C.1 Electronic Identifiers

Identifier	Example	Comments
ISO 11784 <sup>20</sup>	981-018285778231	<p>The ISO 11784 codes are managed by the international committee for animal recording (ICAR<sup>21</sup>). There are several representations of the code:</p> <ul style="list-style-type: none"> <li>- Hexadecimal, which includes the entire code including flag bits</li> <li>- Decimal, which generally just shows the country or manufacturer code and animal number.</li> </ul> <p>In New Zealand, we use manufacturer codes where animal numbers are maintained uniquely by manufacturers. This is in contrast to (for instance) Europe, where a country-code is used, and each country maintains the unique set of animal numbers.</p>
GS1 SGTIN	urn:epc:id:sgtin:3.003700.00542.77346595	Some trials with UHF RFID in deer <sup>22</sup> have used an SGTIN (Serialised Global Trade Item Number) issued by global standards organisation GS1 <sup>23</sup> , which functions much like a barcode identifies a category of products, but with the addition of a unique item number as well.

### C.2 Official Recording Scheme Identifiers

Identifier	Example	Comments
AHB Birth ID	1234567-12-123	<p>A tag issued by the Animal Health Board (AHB)<sup>24</sup> that includes herd number (7 digits), year born (2 digits) and an animal number that is unique within herd and year.</p> <p>The Hereford Prime Hpid initiative, and Angus Pure Source and Trace use the AHB Birth ID.</p>
AHB Sequence No	1234567-3123	A tag issued by AHB that includes just the herd and a sequence number within that herd.

<sup>20</sup> Specified in ISO 11784:1996 and referenced in ISO 14223-2:2010 (see [http://www.iso.org/iso/home/store/catalogue\\_tc/catalogue\\_detail.htm?csnumber=19982](http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=19982)).

<sup>21</sup> International Committee for Animal Recording: [www.icar.org](http://www.icar.org)

<sup>22</sup> The Use of EPC RFID Standards for Livestock and Meat Traceability, Gary Hartley, NZ RFID Pathfinder Group, January 2013 (<http://www.rfid-pathfinder.org.nz/wp-content/uploads/2012/08/EPCIS-Final-Report5.pdf>)

<sup>23</sup> GS1: <http://www.gs1.org/epcglobal>

<sup>24</sup> Animal Health Board (at [www.tbfree.org.nz](http://www.tbfree.org.nz)) and programme at <http://tbfree.org.nz/Publications-news/Guidelines-SOPs-Manuals/National-ID-Programme>



Identifier	Example	Comments
Dairy Birth ID (MINDA)	ABDC-12-1234	The Dairy Birth ID format is used by both CRV and LIC, and includes a four-letter participant code, followed by a 2-digit year and then the animal number which is unique within the participant and year. This forms one of the Dairy Core Database fields defined in the herd testing standards <sup>25</sup> .
NAIT AHB TRAKA	981-018285778231-1234567	NAIT-compatible “Traka” tag issued by AHB. Traka tags <sup>26</sup> are typically used for replacements or tagging existing animals.
NAIT Dairy Traka	981-018285778231-ABDC	A NAIT compatible Dairy “Traka” tag is the same format as that issued by AHB, but has the dairy participant code instead of the AHB number.
NAIT Dairy Management Tag	981-018285778231-LMNO-123	A NAIT compatible Dairy Management Tag combines the current herd participant code, management number, and an ISO 11784 RFID number to make a unique identification for existing dairy cows, as an alternative to using Traka tags.
SIL (Sheep)	12345.12738.2012	SIL <sup>27</sup> is the industry performance recording scheme for sheep other than Merinos in New Zealand, and is also used to operate Deer Select. An official SIL identifier includes the flock code and tag (the latter a text string), and may optionally include the year born (by convention the year is often included in the tag number).
MerinoSelect	502302-2009-090736	Merino Select <sup>28</sup> is the Australian Merino performance recording system, which is used by NZ Merino stud breeders. Animal identification is in the form flock code, year born (4 digits), and animal number.

### C.3 Other Animal Identifiers

Identifier	Example	Comments
Interbull	HOLNZLM000123456789	ICAR’s Interbull <sup>29</sup> programme is used to compare bulls across multiple countries, and may be used to align national breeding schemes to allow comparison. The identifier contains: Breed (HOL, JEY, AYS...), Country (NZL, NDL), Sex (M), and a 12-character animal number.
Bull AB Code	102271	LIC currently issues AB Codes (6-digit numbers) for bulls used in the dairy industry. These codes are shorter to use on straws, catalogues, and forms, and are unique within NZ dairy bulls.

<sup>25</sup> NZS 8100, 2011 draft Herd Testing Standard (and earlier 2007 edition).

<sup>26</sup> For more about Traka tags, see the NAIT Visual Tag guidelines under <http://www.nait.co.nz/news-and-publications/nait-user-guides-and-fact-sheets/tagging-requirements/>

<sup>27</sup> SIL: Sheep Improvement Limited – a wholly owned subsidiary of Beef+Lamb NZ, [www.sil.co.nz](http://www.sil.co.nz)

<sup>28</sup> Merino Select: <http://www.sheepgenetics.org.au/Breeding-services/MERINOSELECT-Home>

<sup>29</sup> Interbull Guidelines at

[http://www-interbull.slu.se/jib/index.php?option=com\\_content&view=article&id=17&Itemid=173](http://www-interbull.slu.se/jib/index.php?option=com_content&view=article&id=17&Itemid=173)

Identifier	Example	Comments
LIA Identification	L2-123456-1980-123	The LIA (Livestock Improvement Association) codes were used to identify dairy animals before 1985 <sup>25</sup> . The code consists of LIA region (2 characters), herd code (6 digits), year (4 digits), and animal number (6 character string).
Breed Society Pedigree No	123456-JR	The dairy industry herd book ID <sup>25</sup> for pedigree dairy animals born before 1985 consists of the herd book number (6 characters), and a breed society identifier (technically 6 character string, but two characters used).

## Appendix D Group Attributes Data Dictionary

See also *Groups of Animals – Section 5*

Item Name	Description	Data Type
Identification	A group may have 1..n identifications	URN Identifier
Display Name	A non-unique name of the group	String
Location	Location identifier to which the group belongs. An animal that is grazing off at another farm may have groups on both the owning and grazing farms.	URN location identifier
Species	Describes the species in common terms	Enumeration: Cattle, Deer, Goats, Sheep
Display Prefix	A short text prefix displayed in front of animals when listed in a breed society herd or flock book	String
Group Type	Distinguishes between a physical management group (a mob of some sort) and other sorts of groupings such as a logical group of animals for analysis, or a planned group (a draft list).	Enumeration: Herd, Mob, Session, Draft List, Comparison
Member Of	Identifier of a master group (for instance, mobs are members of a herd)	URN Identifier
Group Members	identifiers of groups that are members of this group (for instance, mobs in a herd)	URN Identifier
Animal Members	Identifiers of animals that are members of this group	URN Identifier
Draft Gate	Gate number for use in a draft list	Integer
Criteria	Representation of the criteria used to generate a group	String
Primary Sire Breed	There is no internationally recognised master list of livestock breeds. ICAR mandates a list of codes for bovine semen straws <sup>30</sup> , and Oklahoma State University publishes a useful list of livestock breeds <sup>31</sup> . The UN Food and Agriculture Organisation (FAO) maintains a database of all domestic livestock breeds <sup>32</sup> . We recommend that we develop and publish a list of breeds that includes the above lists and standardises codes	Enumeration
Primary Dam Breed	As for Primary Sire Breed	Enumeration
Status	Status of the Group	Enumeration: Active, Inactive

<sup>30</sup> ICAR Guidelines 2012, *Section 8 Annex 1, Breed Codes on Bovine Semen Straws for International Trade assigned by ICAR Sub-committee Interbull*, International Committee for Animal Recording.

<sup>31</sup> Oklahoma State University Livestock Breeds, <http://www.ansi.okstate.edu/breeds/>.

<sup>32</sup> FAO Domestic Animal Diversity Information System, <http://dad.fao.org/>

Item Name	Description	Data Type
Primary Contact Details	Name and contact information for the primary contact for the group	XML, specified using EANCOM/GS1 <sup>33</sup> , EDIFACT <sup>34</sup> , UBL <sup>35</sup>

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<sup>33</sup> GS1 standards for business messaging, [http://www.gs1.org/gsm/kc/ecom/eancom\\_overview](http://www.gs1.org/gsm/kc/ecom/eancom_overview)

<sup>34</sup> United Nations rules for Electronic Data Interchange for Administration, Commerce and Transport, <http://www.unece.org/cefact/edifact/welcome.html>

<sup>35</sup> OASIS Universal Business Language, <http://docs.oasis-open.org/ubl/os-UBL-2.1/UBL-2.1.html>