

DIGAD CDP Interface Specification

for Herd Recorders

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1.1 Document control

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1.2 Revision history

Version	Date	Comment
D1.5.8	14 July 2020	 Spell and Grammar check corrections Added TraitsOtherThanProductionInspectionEvent 202006 Add Teat Length to TOPTraitTypeCode Renamed existing TOPTraitTypeCode for Fore Udder and Rear Legs Set Documented the allocated range of Participant Codes for the HRPs in section 5.7.1 Previous Animal Herd details now provide Start and End dates as distinct fields Combine Previous Animal Herd Details and Previous Animal Herd Management Number Details Update cardinality for Artificial Insemination Bulls to "0 to many" to match the WSDL
D1.5.7	08 May 2020	 Change QueryAnimalByIdentifier to QueryAnimal Adjust version of QueryAnimal to 201906 Added SexTypeCode to QueryAnimal
D1.5.6	06 April 2020	 Explicitly documenting AnimalDurableKey as a long data type i.e. 64-bit integer Updated international ID cardinality to be "0 or 1" instead of "0 to many" for AnimalEvent and NewAnimalEvent Added QueryAnimalByIdentifier Added Herd not found to BRE7
D1.5.5	20 January 2020	 Remove Cow Identification from outgoing API mating events. The cow is implied by the event relationship (this data is not shared if bulls change HRP) Move animal identification and herd identification datatypes to a new Outgoing API heading Added FateTypeCode and CauseOfFateTypeCode to outgoing Animal Herd Details
D1.5.4	17 December 2019	 Added action element to New Animal Event response Added Previous Animal Herd Details to outgoing API Remove gene test from outgoing animal identification Expanded BRE8 to cover all farming object relationship types
D1.5.3	10 October 2019	 Added extra documentation to describe BRE8 Shifted herd identification in outgoing data up one level
D1.5.2	28 August 2019	 Added Herd Identification to outgoing animal identification
D1.5.1	31 July 2019	 General clean-up of the document Remove obsolete API errors Update technical section for new API



Version	Date	Comment	
D1.5.0	17 June 2019	 Added NewAnimalEvent Changed CDPAnimalIdentifier to AnimalDurableKey for events related to an animal Added BRE7 to BRE11 Removed all BVEs (now obsolete) and references to asynchronous verification 	
D1.4.3	18 March 2019	 Added UTC constraints for PretestMilkingDateStamp, Test1DateStamp, Test2DateStamp Deprecated CDPParticipantIdentifier, CDPHerdIdentifier, CDPLocationIdentifier Tightened up outgoing data types 	
R1.4.2	25 February 2019	 Reset AnimalEvent back to 201501 as the NAIT Identifiers are optional 	
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R1.2.4	18 th March 2014	Aligns with Phase 1 Release 2 build.	
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R1.2.2	11 th December 2013	Deprecated. Changes moved to R1.2.3.	
R1.2.1b	26 th February 2014	Retrospective version including variations included in release 1 defect fixes. Aligns with Phase 1 Release 1 build.	
R1.2.1	26 th November 2013	Minor alterations per Appendix 1.	
R1.2	25 th November 2013	Multiple alterations following data migration analysis, per Appendix 1.	



Version	Date	Comment
R1.1	31 st October 2013	Second release. Reflects solution to gaps identified during data migration per Appendix 1.
R1.0	29 th October 2013	First release. Aligns with current development build.

1.3 Related Documents

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2 Introduction

2.1 Purpose

The purpose of this document is to describe the electronic interface by which Herd Recorder Providers (HRPs) may routinely register dairy farm data in DIGAD. Herd Recorders are a particular class of Certified Data Provider (CDP) and thus the terms "HRP" and "CDP" are interchangeable for the purpose of this document.

The interface scope includes:

- CDP registration of farm events with DIGAD,
- CDP retrieval of notifications generated by DIGAD when processing the farm events into DIGAD.

The functional description of the CDP interface is described in sections 3 through 13.

A high-level technical description is described in section 15 "Technical Overview".

2.2 Terminology

- HRPs record farming **events** in their internal information systems.
- HRPs register farming events in DIGAD via electronic messages sent over the internet.
- In order to send a message to DIGAD, a CDP requests the use of a DIGAD web service.
- A DIGAD web service accepts a message in the form of an XML document.
- The XML document comprises a SOAP envelope and SOAP body. The SOAP body contains the event information comprising a MessageHeader with meta-data common to all event types, and the event data specific to the event.

2.3 Farm Event Overview

A DIGAD "event" is defined as a documented observation or measurement of some "real-world" farm object or occurrence related to dairy farming.

Farming events are divided into two categories: "Farming Network" events and "Animal Trait" events.

2.3.1 Farming Network Events

Farming Network events directly inform the state of the farming network, which comprises the physical farming objects and their relationships to each other.

Farming Network events may be further categorised as follows:

- **Farming Object Events:** Informs the state of a Farming Object.
- Farming Object Identification Events: Informs the state of a Farming Object's identifiers.
- Farming Object Relationship Events: Informs the state of a relationship between two Farming Objects.

2.3.2 Animal Trait Events

Animal Trait events describe animal trait observations or measurements. Animal Trait events reference one or more animal objects recorded in the Farming Network.

2.4 Farming Network Definition

2.4.1 Overview

The Farming Network comprises the farming objects and their relationships. Events from Herd Recorders inform the state of the network over time.



The diagram below illustrates the Farming Objects relationships relevant to DIGAD. The relationship arrow indicates the functional dependency between Farming Objects. For example, an animal may belong to a herd but not vice versa.

The network comprises two distinct parts, "physical" and "commercial":

- The physical part of the network describes relationships which are physically constrained viz.:
 - an Animal may be related to 0 3 Animals,
 - \circ an Animal may be related to 0 1 Herd (at any one time),
 - \circ a Herd may be related to 0 1 Location (at any one time)
- The commercial part of the network describes relationships which are constrained only by commercial constructs: many to many relationships may exist between objects at any one time, differentiated only by the relationship type.

Please note that the "Animal to Animal" relationship describes both parental and embryo recipient relationships, hence an Animal may have to up to three types of relationships to other Animals.



Figure 1 – Farming Network Model

The table below lists the items illustrated in the Farming Network diagram. Relationships are described from the perspective of the dependent object.



Dependent Farming Object	Related Object	Relationship Type Code	Relationship Type
Animal	Animal	S	is progeny of the Sire
		D	is progeny of the Dam
		R	was calved by the embryo transfer Recipient
	Herd	М	is a member of
	Industry Participant	AE	is enrolled for AE services
		AEP	is recorded to maintain Pedigree of an AE enrolled animal
Herd	Location	F	is Farmed at
	Participant	MC	Milk is Contracted to
	Industry Participant	HR	is Herd Recorded by
		HT	is Herd Tested by
		РТ	is Progeny Tested by
Participant	Industry Participant	PBSM	is a Participating Breed Society Member of
Location	-		-
Industry Participant	-		-

2.4.2 Farming Network Design Principals

The following principals were used to define the Farming Network.

- 1. A "farming object" is considered to be something that exists for a period (i.e. for longer than an instant), and that is considered to exist whether or not anything is actively observing it.
- 2. A "relationship" between two farming objects is considered to be some fact that relates the two farming objects, where the relationship is true for a measured period.
- 3. Events are used by HRPs to inform the state of the Farming Network. Events also inform the Animal trait data recorded in DIGAD, but Animal trait data does not form part of the Farming Network.
- 4. The functional dependency between two types of Farming Objects is always the same. For example, an Animal belongs to a Herd and a Herd may comprise many Animals, but the reverse is never true.
- 5. DIGAD allows a farming object to be related to zero or many types of other farming objects at one time. For example, an Animal could be related to no herds, no industry participants and no other animals. Equally, an animal may be related to any one or all the other types of farming objects.
- 6. There may be only one relationship between a farming object and any other farming object for a particular reason at a particular time.
- 7. The exception to the above principal is "ancestry" (animal to animal) relationships. In this area of the network there may be only one relationship between two animals, regardless of the reason for the relationship. An animal may have relationships to multiple other animals for the same reason, however. For example, if an HRP were to record multiple potential sires for an animal on account of a mixed semen straw mating, DIGAD would support multiple relationships between the animal and the possible sire animals for the reason of "is genetic progeny of a sire". The ancestry official indicator would attest to the reliability of each of the ancestry records.

2.4.3 Farming Network Object Identifiers

There are three types of identifiers that a CDP may use to identify a farming object:

Industry Identifiers

• Enumerated in accordance with a published standard or agreed specification.



- Routinely shared and used by all industry participants when communicating with each other and DIGAD.
- Made available to all industry participants and stored within all industry participant systems and DIGAD.

CDP Identifier

- Proprietary identifiers enumerated by a CDP's source transaction system.
- Routinely used by the CDP when communicating with DIGAD.
- Shared with and stored by DIGAD: DIGAD stores every CDP's identifier if more than one CDP has provided an identifier with an object
- DIGAD does not routinely share a CDP's identifiers with another CDP.

– DIGAD Durable Key

- In addition to recording the identifiers provided by the CDP, DIGAD enumerates proprietary, internal identifiers to maintain integrity of the DIGAD database.
- DIGAD internal identifiers are usually not used in routine CDP communication but may be used in administrative processes such as reconciliation. The exception is the Animal Durable Key which is used as a primary identifier when communicating about an animal with DIGAD.

Farming Object	CDP Identifier	Industry Identifier	DIGAD Durable Key
Animal	ü	nil (Note: DIGAD treats animal industry identifiers as descriptive attributes of the animal and are used to match on a DIGAD Animal Durable Key)	ü
Herd		HerdLocationIdentifier	
Location		NZMS1FarmGateIdentifier	
Participant		ParticipantCode	
Industry Participant		IndustryParticipantCode	

The table below lists the types of identifiers that a CDP may be used to identify each type of farming object.

2.4.4 Farming Network Relationship Identifiers

A relationship between two farm objects is described by two events: the relationship start event, and the relationship end event.

Two data identify a "physical" relationship event as follows:

- the date
- the dependent farming object

Four data identify a "commercial" relationship event as follows:

- the date
- both farming objects involved in the relationship
- the relationship type



2.5 Event System Identification

All events are considered to be unique from an information systems perspective. DIGAD will assign arbitrary system identifiers to each received message to enable processing. The CDP may also assign an arbitrary unique identifier to the message which DIGAD will store and use in any return information.

2.6 Writing and Retracting Events

From an information systems perspective Events are observations about things or the measurements about those things. In some instances however, CDPs may wish to "retract" an event, in effect to say that a particular thing did not exist, or a measurement never happened. In this case a message may be sent that constitutes a "retraction" of a thing previously said to have existed or to have happened. The only business data required to be provided with a retraction is the data that identifies the Event.

DIGAD will not physically delete data. Retracted events will remain recorded in DIGAD, but flagged as "deleted".

2.7 Event Triggers

The DIGAD expectation is that CDPs will trigger events from state changes to operational data stores. If a CDP was triggering DIGAD events from an event-based system, the expectation is the CDP will "forward" validated event information to DIGAD.

The frequency with which a CDP assesses the state changes to their operational systems and generates events, is determined by:

- The Herd Testing Standard.
- The data supply agreement between the CDP and DairyNZ with respect to the "frequency of supply" measure.

The DIGAD technical solution does not require data to be sent with any particular frequency, albeit DIGAD has maximum throughput rates that will determine processing latency in response to volume and frequency of CDP event generation.

2.7.1 Farm Networking Event Triggers

- A Farming Object event should be triggered whenever a Farming Object is created, updated or deleted.
 Changes to a Farming Object's identifiers or relationships should not trigger a Farming Object Event.
- A Farming Object Identifier event should be triggered whenever the set of identifiers is changed i.e. any member or members of the set are removed or added.
- A Farming Object Relationship event should be triggered whenever a relationship between two Farming Objects is created, updated or deleted.

2.7.2 Animal Trait Event Triggers

An Animal Trait Event should be triggered whenever a trait observation is created, updated or deleted.

2.8 Temporal Data

The current state of the network is based on the most recent farming event data. DIGAD will retain accumulated historical data in a form that allows the network state to be derived as at any previous point in time. The CDP need only provide new information as the current state evolves over time.



2.9 Schema/Services Versioning

The DIGAD web services implementation supports versioning of XML schemas and web services. In order to support non-breaking releases of schema/services, versioned schemas/services will be released where possible to avoid forcing one or more CDPs into a single update schedule. When an obsolescent schema/service ceases to be used by all CDPs, it will be deprecated.

The CDP specification is written from the perspective of the latest versions of the schema/services, albeit if multiple versions are operational the prior versions will be listed for completeness. If a full description of a previous version schema or service is required however, the relevant prior version of the CDP specification must be consulted.

3 Message Overview

3.1 Message Structure

A message is an XML document comprising the following parts:

- SOAP envelope: the top element of the XML document. Specifies the URI of the namespaces that define the XML document as a SOAP message.
- **SOAP header:** not applicable (no prescription for its use is made beyond the W3C standard)
- **SOAP body:** contains the farming event data fields. The body is comprised of three parts:
 - schema root node: describes the farming event type and version to be actioned
 - message header: contains the event meta-data
 - **event data:** contains the data that describes the farming event i.e. comprises the core and noncore data required for AE and NBO purpose

The sections below describe the elements of each part of the SOAP body.

3.2 Schema Root Node

The schema root node comprises a single XML element containing:

- The unique label of the schema root node for the DIGAD event type. For example, the AnimalEvent has an action RegisterAnimalEvent.
- The URI of the XML namespaces that define the elements within the XML document. Namespaces aren't
 always provided in XML samples found in this document, but namespace information will be contained in
 the respective WSDLs.

An example for an animal event would be:

<RegisterAnimalEvent xmlns="http://DairyNZ.co.nz/DIGAD/External/201501" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" MinorVersion="1">

A single message might contain namespaces corresponding to multiple versions of a particular schema and the version numbers mentioned in this document against specific message types only necessarily relates to the root node's namespace.

A complete list of DIGAD schema root nodes and versions is contained in the section "List of Farm Events and XML Schemas".

3.3 MessageHeader

element	cardinality	business rules
CertifiedDataProviderIdentifier	1	Identifies the Industry Participant that is calling the DIGAD interface.
CDPMessageldentifier	0 or 1	Used by the CDP for cross-referencing in exceptions-handling processing. CDP's should populate this field with a value that will be meaningful to them in any return messages. DIGAD will not apply any business rule verification to this field.
EventChangeTime	1	The date/time when a CDP would consider that they knew the data existed.
OriginatorIdentifier	1	Represents the Industry Participant that "owns" the data on account of the Industry Participant's relationship to the herd and their role in validating and storing the herd data in the first instance.

3.3.1 MessageHeader Data Descriptions



element	cardinality	business rules
EventInstruction	1	CDPs must set the value for all new, updated and changed events to the value "write", and deleted events to "retract". Please note that DIGAD will never physically delete data. All object identification events must have an EventInstruction of "write".

3.3.2 Event Instruction Constraints

The "write" instruction can always be set for any event. The "retract" instruction can be set for all events other than farming object identification events, namely:

- HerdIdentificationEvent
- LocationIdentificationEvent
- ParticipantIdentificationEvent

3.3.3 Example

An example MessageHeader XML fragment.

3.4 Event Data

The "Event" part of the message contains the business data that constitutes the core and non-core data required for AE and NBO purpose. The business data required for each event type varies however, and thus have their own description in subsequent sections of this document.

The structure of the Event part of the message is the same for all event types and is described below. Please note the square brackets encapsulate explanatory notes that are not part of the XML document specification.

<Event>

...

<[event name e.g. "Animal"]>

[all elements in this area contain the business data that collectively identify a unique event¹]

<WriteElements>

[the WriteElements part and elements within it must be presented if the MessageHeader EventInstruction element value is "write", and conversely may not be presented if the EventInstruction value is "retract"]

¹ DIGAD will only allow one current instance per unique event based on these elements. If an additional message is sent through with the same elements, this will be treated as an update to the current version of the event. As there is only one instance, a retract will remove the entire event, including any updates provided over time.



</WriteElements>

</[event name e.g. "Animal"]>

</Event>



3.5 Complete XML Document Example

Below is an example of a complete SOAP document based on RegisterAnimalEvent version 201501. Please note the example does not contain all possible animal event data elements within the XML document.

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"</pre>
xmlns:ns="http://DairyNZ.co.nz/DIGAD/External/201501">
  <soap:Header/>
  <soap:Body>
    <RegisterAnimalEvent xmlns="http://DairyNZ.co.nz/DIGAD/External/201501"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema" MinorVersion="1">
      <MessageHeader>
        <CertifiedDataProviderIdentifier>LIC</CertifiedDataProviderIdentifier>
        <CDPMessageIdentifier>e46ca182-053b-491e-a9d2-
        6f329748ce2b</CDPMessageIdentifier>
        <EventChangeTime>2014-11-28T21:12:56.637Z</EventChangeTime>
        <OriginatorIdentifier>LIC</OriginatorIdentifier>
        <EventInstruction>write</EventInstruction>
      </MessageHeader>
      <Event>
        <Animal>
          <AnimalIdentification>
            <CDPAnimalIdentifier>34210057</CDPAnimalIdentifier>
          </AnimalIdentification>
          <WriteElements>
            <BirthIdentifier>
              <ParticipantCode>FTPJ</ParticipantCode>
              <YearOfTag>2008</YearOfTag>
              <BirthIdentificationNumber>19</BirthIdentificationNumber>
            </BirthIdentifier>
            <SexTypeCode>F</SexTypeCode>
            <DateOfBirth>2008-08-14/DateOfBirth>
            <DateOfBirthConfidenceIndicatorTypeCode>1</DateOfBirthConfidenceIndicator</pre>
            TypeCode>
            <CountryOfOriginCode>NZL</CountryOfOriginCode>
            <AnimalName />
            <BreedDistribution>
              <BreedTypeCode>AYR</BreedTypeCode>
              <Breed16th>1</Breed16th>
            </BreedDistribution>
            <BreedDistribution>
              <BreedTypeCode>JER</BreedTypeCode>
              <Breed16th>15</Breed16th>
            </BreedDistribution>
          </WriteElements>
        </Animal>
      </Event>
    </RegisterAnimalEvent>
  </soap:Body>
</soap:Envelope>
```



4 Farming Object Identifier Elements & Schema Rules

4.1 Overview

Events always pertain to one or more Farming Network objects. This section contains the descriptions of the identification elements of each Farm Object type. Farming Object identification elements are common across each event type and thus are described once in this section and referenced accordingly in subsequent sections of the specification.

4.2 Notation

The data description notation uses the following concepts:

- Elements that identify an event are **bolded**.
- "Container" elements are indicated by *italicized* text.
- "Field" elements that form identifying attributes within a child element set are indicated by an <u>underline</u>.
- The cardinality of a container or field element is specified relative to the field(s) that uniquely identify the immediate parent element set.

4.3 Animal Identification Elements

Herd Recorders are required to identify animals using the Herd Recorder's internal system identifier only a.k.a the CDPAnimalIdentier.

DIGAD stores each CDP's internal system identifier against the Animal, allowing multiple CDPs to refer to the same Animal (if necessary) by their own internal identifier. DIGAD uses the CertifiedDataProviderIdentifier in the message header to qualify the CDPAnimalIdentifier, and thus store each CDP's identifier against the Animal.

All the following animal identification elements share a common data description. The element names reflect the different roles an animal can take within a farming event.

- AnimalIdentification
- ProgenyIdentification
- AncestorIdentification
- Cowldentification
- BullIdentification
- DamIdentification
- SireIdentification
- ArtificialInseminationBullIdentification
- EmbryoDonorIdentification
- EmbryoSireIdentification
- EmbryoRecipientIdentification
- RelatedAnimalIdentification

The data description is as follows:

element	cardinality	schema rules
AnimalDurableKey	1	long

4.3.1 XML Example

An example XML fragment that identifies an animal in the role of "Sire".



4.4 Herd Identification Elements

4.4.1 HerdIdentification, CurrentHerdIdentification and NewHerdIdentication

Element	cardinality	comment
HerdLocationIdentifier	1	
NZMS1FarmGateIdentifier	1	Identifies the location of the herd.
HerdNumber	1	The sequence of the herd at the location.
CDPHerdldentifier	0 or 1	Deprecated as of 1.4.3

4.4.2 Other Herd Identification Elements

All other herd identification elements share a common description. The other elements are:

- RelatedHerdIdentification
- TestedHerdIdentification

The schema rule is that at least one of the identification elements must be supplied.

The data description is as follows:

Element	cardinality	comment
HerdLocationIdentifier	0 or 1	Identifies the location of the herd.
NZMS1FarmGateIdentifier	1	The location identifier.
HerdNumber	1	The sequence of the herd at the location.
CDPHerdIdentifier	0 or 1	Deprecated as of 1.4.3

1.1.1 XML Example

...

...

An example Herd Identification XML fragment.

```
<HerdIdentification>
   <HerdLocationIdentifier>
        <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
        <HerdNumber>?</HerdNumber>
        </HerdLocationIdentifier>
        </HerdIdentification>
```



4.5 Location Identification Elements

4.5.1 LocationIdentification, CurrentLocationIdentification and NewLocationIdentification

Element	cardinality	comment
NZMS1FarmGateIdentifier	1	
CDPLocationIdentifier	0 or 1	Deprecated as of 1.4.3

4.5.2 Other Identifier Elements

The other location identification element is "RelatedLocationIdentification". The schema rule is that at least one of the identification elements must be supplied.

The data description is as follows:

Element	cardinality	comment
NZMS1FarmGateIdentifier	0 or 1	
CDPLocationIdentifier	0 or 1	Deprecated as of 1.4.3

1.1.1 XML Example

An example Location Identification XML fragment.

...



4.6 Participant Identification Elements

4.6.1 ParticipantIdentification, CurrentParticipantIdentification and NewParticipantIdentification

Element	cardinality	comment
ParticipantCode	1	
CDPParticipantIdentifier	0 or 1	Deprecated as of 1.4.3

4.6.2 Other Participant Identification Elements

The other participant identification element is "RelatedParticipantIdentification". The schema rule is that at least one of the identification elements must be supplied.

The data description is as follows:

Element	cardinality	comment
ParticipantCode	0 or 1	
CDPParticipantIdentifier	0 or 1	Deprecated as of 1.4.3

1.1.1 XML Example

An example Participant Identification XML fragment.

```
...
<ParticipantIdentification>
    <ParticipantCode>?</ParticipantCode>
</ParticipantIdentification>
```



4.7 Industry Participant Identifier

All industry participant elements share the same description. The elements are:

- IndustryParticipantIdentifier
- RelatedIndustryParticipantIdentifier

The data description is as follows:

Element	cardinality	comment
IndustryParticipantIdentifier	1	A single, industry-wide identifier will exist for each industry participant. Industry Participant identifiers will be enumerated and provisioned by NZAEL.

1.1.2 XML Example

An example Participant Identifier XML fragment.

...

<IndustryParticipantIdentifier>?</IndustryParticipantIdentifier>

...



5 Farming Object Events

5.1 NewAnimalEvent

5.1.1 Overview

"NewAnimalEvent" allows a CDP to match to an existing DIGAD animal or create one if it does not already exist.

Used if the animal is new to DIGAD and/or the CDP does not already have an Animal Durable Key. Calling this event will return an Animal Durable Key in the response payload.

NOTE: The event is not used to perform updates on animal identifiers for existing animal records, CDPs will use the *AnimalEvent* message to update an animal record

5.1.2 Versions

201906: created (cloned from AnimalEvent)

5.1.3 Data Descriptions

Element	cardinality	business rules
NewAnimal	1	All fields should be populated if data exists and is relevant
CDPAnimalldentifier	1	The CDP's internal system identifier of the Animal
WriteElements	1	required
NAITIdentifier	0 to many	
RFID	0 or 1*	* At least one RFID or NAITVisualTagID is required per NAIT Identifier
NAITVisualTagID	0 or 1*	* At least one RFID or NAITVisualTagID is required per NAIT Identifier
CurrentForAnimal	1	Identifies if this NAIT Identifier is the one in use by the animal now.
BirthIdentifier	0 or 1	
ParticipantCode	1	
YearOfTag	1	
BirthIdentificationNumber	1	
ArtificialBreedingCode	0 or 1	
AnimalHealthBoardIdentifier	0 or 1	
AHBNumber	1	
AHBYearOfTag	0 or 1	
AHBSerialNumber	1	
InternationalIdentifier	0 or 1	
<u>CountryCode</u>	1	
InternationalIdentification	1	
HerdbookIdentifier	0 or 1	
HerdbookNumber	1	
HerdbookAnimalSex	1	



Element	cardinality	business rules
BreedSociety	1	
LivestockImprovementAssociationIdentifier	0 or 1	
LIAHerdRegion	1	
LIAHerdCode	1	
LIAIdentificationYear	1	
LIAIdentificationTagOrTattoo	1	
SexTypeCode	0 or 1	refer section 13 "Reference Data"
DateOfBirth	0 or 1	
DateOfBirthConfidenceIndicatorTypeCode	0 or 1	refer section 13 "Reference Data"
CountryOfOriginCode	0 or 1	refer section 13 "Reference Data"
AnimalName	0 or 1	
BreedDistribution	0 to many	
BreedTypeCode	1	refer section 13 "Reference Data"
Breed16th	1	Please note DIGAD will not verify if the sum of an animal's 16ths equals 16.
GeneTest	0 to many	Required for AB enrolled bulls only.
<u>LocusTypeCode</u>	1	refer section 13 "Reference Data"
AlleleTypeCode	1	If the animal is heterozygous or homozygous for the defect the allele type code should be "+".
		If the animal is homozygous for no defect the allele type code should be "-".

Repeating elements within the event are required to be unique. Uniqueness will be verified according to the constraint rules listed below.

constraint name	element key field(s)	rule
InternationalIdentifierConstraint	CountryCode	within an animal identification element only one <i>InternationalIdentifier</i> element is allowed per <u>CountryCode</u> value
BreedDistributionConstraint	BreedTypeCode	within <i>Animal</i> , only one <i>BreedDistribution</i> element is allowed per <u>BreedTypeCode</u> value
GeneTestConstraint	LocusTypeCode	within <i>Animal</i> , only one <i>GeneTest</i> element is allowed per <u>LocusTypeCode</u> value

5.1.4 Response Document

Element	cardinal ity	Data type	business rules
Animal Durable Key	1	Long	The Animal Durable Key that was either created or matched with
CurrentCDP	0 or 1	String	The CDP that is the "Herd Recorder" for the animal. If omitted, there is no current "Herd Recorder"



Element	cardinal ity	Data type	business rules
Action	1	String	"New" or "Match". Will be "New" if the animal record was added to DIGAD; or "Match" if the animal record already exists in DIGAD

XML Example 5.1.5

...

<event></event>
<newanimal></newanimal>
<cdpanimalidentifier>?</cdpanimalidentifier>
<writeelements></writeelements>
<naitidentifier></naitidentifier>
<rfid>?</rfid>
<naitvisualtagid>?</naitvisualtagid>
<currentforanimal>?</currentforanimal>
<birthidentifier></birthidentifier>
<participantcode>?</participantcode>
<yearoftag>?</yearoftag>
<birthidentificationnumber>?</birthidentificationnumber>
<livestockimprovementassociationidentifier></livestockimprovementassociationidentifier>
<liaherdregion>?</liaherdregion>
<liaherdcode>?</liaherdcode>
<liaidentificationyear>?</liaidentificationyear>
<liaidentificationtagortattoo>?</liaidentificationtagortattoo>
<herdbookidentifier></herdbookidentifier>
<herdbooknumber>?</herdbooknumber>
<herdbookanimalsex>?</herdbookanimalsex>
<breedsociety>?</breedsociety>
<artificialbreedingcode>?</artificialbreedingcode>
<animalhealthboardidentifier></animalhealthboardidentifier>
<ahbnumber>?</ahbnumber>
<ahbyearoftag>?</ahbyearoftag>
<ahbserialnumber>?</ahbserialnumber>
<internationalidentifier></internationalidentifier>
<countrycode>?</countrycode>
<internationalidentification>?</internationalidentification>
<sextypelode>?</sextypelode>
<pre><dateofbirth ?<="" pre=""></dateofbirth></pre>
<pre></pre>
ode>
<countryuturigincode>?</countryuturigincode>
<pre><aniimdindine>:</aniimdindine></pre> <pre></pre>
<pre><breedturecodex)<="" pre="">/ProodTureCodex</breedturecodex></pre>
<breed16th>?</breed16th>
(GeneTest)
<locustypecode>?</locustypecode>
<alleletypecode>?</alleletypecode>



```
</NewAnimal>
</Event>
...
```

5.1.6 Retraction

Retractions are not supported in the NewAnimalEvent. If an animal must be retracted, use the AnimalEvent.

5.2 QueryAnimal

5.2.1 Overview

"QueryAnimal" allows a CDP to check if DIGAD knows about an animal.

For example, this may be used if the CDP would like to confirm with DIGAD that they have the correct identifiers for an animal.

No Animal records are created in DIGAD via this message and it is considered a read only operation.

5.2.2 Versions

201906: created

5.2.3 Data Descriptions

Element	cardinality	business rules
QueryAnimal	1	
NAITIdentifier	0 to many	
RFID	0 or 1*	* At least one RFID or NAITVisualTagID is required per NAIT Identifier
NAITVisualTagID	0 or 1*	* At least one RFID or NAITVisualTagID is required per NAIT Identifier
BirthIdentifier	0 or 1	
ParticipantCode	1	
YearOfTag	1	
BirthIdentificationNumber	1	
ArtificialBreedingCode	0 or 1	
AnimalHealthBoardIdentifier	0 or 1	
AHBNumber	1	
AHBYearOfTag	0 or 1	
AHBSerialNumber	1	
InternationalIdentifier	0 or 1	
CountryCode	0 or 1	
InternationalIdentification	1	
Herdbookldentifier	0 or 1	
HerdbookNumber	1	
HerdbookAnimalSex	1	
BreedSociety	1	



Element	cardinality	business rules
LivestockImprovementAssociationIdentifier	0 or 1	
LIAHerdRegion	1	
LIAHerdCode	1	
LIAIdentificationYear	1	
LIAIdentificationTagOrTattoo	1	
SexTypeCode	0 or 1	refer section 13 "Reference Data"

5.2.4 Response Document

Element	cardinal ity	Data type	business rules
AnimalDurableKey	0 or 1	Long	The Animal Durable Key that was matched with. Absence of a value indicates no record was found.
CurrentCDP	0 or 1	String	The CDP that is the "Herd Recorder" for the animal. If omitted, there is no current "Herd Recorder"
LastAnimalHerdEndDate	0 or 1	Date	Only provided if the animal exited a herd and is currently not in a herd
CurrentAnimalHerdEndDate	0 or 1	Date	Only provided if the animal is currently in a herd
SearchStatus	1	String	"Found" or "NotFound". "Found" if DIGAD finds an Animal record matching the identifiers provided. "NotFound" if DIGAD failed to find a record.

5.2.5 XML Example

```
....
<Event>
  <QueryAnimal>
    <NAITIdentifier>
      <RFID>?</RFID>
      <NAITVisualTagID>?</NAITVisualTagID>
    </NAITIdentifier>
    <BirthIdentifier>
      <ParticipantCode>?</ParticipantCode>
      <YearOfTag>?</YearOfTag>
      <BirthIdentificationNumber>?</BirthIdentificationNumber>
    </BirthIdentifier>
    <LivestockImprovementAssociationIdentifier>
      <LIAHerdRegion>?</LIAHerdRegion>
      <LIAHerdCode>?</LIAHerdCode>
      <LIAIdentificationYear>?</LIAIdentificationYear>
      <LIAIdentificationTagOrTattoo>?</LIAIdentificationTagOrTattoo>
    </LivestockImprovementAssociationIdentifier>
    <HerdbookIdentifier>
      <HerdbookNumber>?</HerdbookNumber>
      <HerdbookAnimalSex>?</HerdbookAnimalSex>
      <BreedSociety>?</BreedSociety>
    </HerdbookIdentifier>
    <ArtificialBreedingCode>?</ArtificialBreedingCode>
    <AnimalHealthBoardIdentifier>
      <AHBNumber>?</AHBNumber>
      <AHBYearOfTag>?</AHBYearOfTag>
      <AHBSerialNumber>?</AHBSerialNumber>
```



```
</AnimalHealthBoardIdentifier>
</InternationalIdentifier>
</CountryCode>?</CountryCode>
</InternationalIdentification>?</InternationalIdentification>
</InternationalIdentifier>
</sexTypeCode>?</SexTypeCode>
</QueryAnimal>
</Event>
...
5.2.6 Retraction
```

Retractions are not applicable.



5.3 AnimalEvent

5.3.1 Overview

"AnimalEvent" describes an animal and its identifiers.

NOTE: This event is not used to create an animal based on the provided animal identifiers, CDPs will use the *RegisterAnimalEvent* message to create an animal and obtain an AnimalDurableKey

5.3.2 Versions

201906: updated version described in this document – change AnimalIdentification to use AnimalDurableKey **201501**: obsolescent version described fully in CDP specification 1.4.3

201301. Obsolescent version described fully in eDF specification 1.4.5

201501: obsolescent version described fully in CDP specification 1.3.0

201304: obsolescent version described fully in CDP specification 1.2.6

Element	cardinality	business rules
Animal	1	All fields should be populated if data exists and is relevant. Absence of data will be inferred as a "deletion".
AnimalIdentification	1	Identifier set of the subject animal.
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
NAITIdentifier	0 to many	
RFID	0 or 1*	* At least one RFID or NAITVisualTagID is required per NAIT Identifier
NAITVisualTagID	0 or 1*	* At least one RFID or NAITVisualTagID is required per NAIT Identifier
CurrentForAnimal	1	Identifies if this NAIT Identifier is the one in use by the animal now.
BirthIdentifier	0 or 1	
ParticipantCode	1	
YearOfTag	1	
BirthIdentificationNumber	1	
ArtificialBreedingCode	0 or 1	
AnimalHealthBoardIdentifier	0 or 1	
AHBNumber	1	
AHBYearOfTag	0 or 1	
AHBSerialNumber	1	
InternationalIdentifier	0 or 1	
<u>CountryCode</u>	1	
InternationalIdentification	1	
HerdbookIdentifier	0 or 1	
HerdbookNumber	1	
HerdbookAnimalSex	1	

5.3.3 Data Descriptions



Element	cardinality	business rules
BreedSociety	1	
LivestockImprovementAssociationIdentifier	0 or 1	
LIAHerdRegion	1	
LIAHerdCode	1	
LIAIdentificationYear	1	
LIAIdentificationTagOrTattoo	1	
SexTypeCode	0 or 1	refer section 13 "Reference Data"
DateOfBirth	0 or 1	
DateOfBirthConfidenceIndicatorTypeCode	0 or 1	refer section 13 "Reference Data"
CountryOfOriginCode	0 or 1	refer section 13 "Reference Data"
AnimalName	0 or 1	
BreedDistribution	0 to many	
BreedTypeCode	1	refer section 13 "Reference Data"
Breed16th	1	Please note DIGAD will not verify if the sum of an animal's 16ths equals 16.
GeneTest	0 to many	Required for AB enrolled bulls only.
LocusTypeCode	1	refer section 13 "Reference Data"
AlleleTypeCode	1	If the animal is heterozygous or homozygous for the defect the allele type code should be "+".
		If the animal is homozygous for no defect the allele type code should be "-".

Repeating elements within the event are required to be unique. Uniqueness will be verified according to the constraint rules listed below.

constraint name	element key field(s)	rule
InternationalIdentifierConstraint	CountryCode	within an animal identification element only one <i>InternationalIdentifier</i> element is allowed per <u>CountryCode</u> value
BreedDistributionConstraint	BreedTypeCode	within <i>Animal</i> , only one <i>BreedDistribution</i> element is allowed per <u>BreedTypeCode</u> value
GeneTestConstraint	LocusTypeCode	within Animal, only one GeneTest element is allowed per LocusTypeCode value

5.3.4 XML Examples

```
Dairynz₿
```

```
<NAITIdentifier>
        <RFID>?</RFID>
        <NAITVisualTagID>?</NAITVisualTagID>
        <CurrentForAnimal>?</CurrentForAnimal>
      </BirthIdentifier>
      <BirthIdentifier>
        <ParticipantCode>?</ParticipantCode>
        <YearOfTag>?</YearOfTag>
        <BirthIdentificationNumber>?</BirthIdentificationNumber>
      </BirthIdentifier>
      <LivestockImprovementAssociationIdentifier>
        <LIAHerdRegion>?</LIAHerdRegion>
        <LIAHerdCode>?</LIAHerdCode>
        <LIAIdentificationYear>?</LIAIdentificationYear>
        <LIAIdentificationTagOrTattoo>?</LIAIdentificationTagOrTattoo>
      </LivestockImprovementAssociationIdentifier>
      <HerdbookIdentifier>
        <HerdbookNumber>?</HerdbookNumber>
        <HerdbookAnimalSex>?</HerdbookAnimalSex>
        <BreedSociety>?</BreedSociety>
      </HerdbookIdentifier>
      <ArtificialBreedingCode>?</ArtificialBreedingCode>
      <AnimalHealthBoardIdentifier>
        <AHBNumber>?</AHBNumber>
        <AHBYearOfTag>?</AHBYearOfTag>
        <AHBSerialNumber>?</AHBSerialNumber>
      </AnimalHealthBoardIdentifier>
      <InternationalIdentifier>
        <CountryCode>?</CountryCode>
        <InternationalIdentification>?</InternationalIdentification>
      </InternationalIdentifier>
      <SexTypeCode>?</SexTypeCode>
      <DateOfBirth>?</DateOfBirth>
       <DateOfBirthConfidenceIndicatorTypeCode>?</DateOfBirthConfidenceIndicatorTypeC</pre>
      ode>
      <CountryOfOriginCode>?</CountryOfOriginCode>
      <AnimalName>?</AnimalName>
      <BreedDistribution>
        <BreedTypeCode>?</BreedTypeCode>
        <Breed16th>?</Breed16th>
      </BreedDistribution>
      <GeneTest>
        <LocusTypeCode>?</LocusTypeCode>
        <AlleleTypeCode>?</AlleleTypeCode>
      </GeneTest>
    </WriteElements>
  </Animal>
</Event>
        Obsolescent Version 201501
5.3.4.2
<Event>
  <Animal>
    <AnimalIdentification>
      <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
    </AnimalIdentification>
    <WriteElements>
      <BirthIdentifier>
        <ParticipantCode>?</ParticipantCode>
        <YearOfTag>?</YearOfTag>
```

Dairynz 🖻

```
<BirthIdentificationNumber>?</BirthIdentificationNumber>
      </BirthIdentifier>
      <LivestockImprovementAssociationIdentifier>
        <LIAHerdRegion>?</LIAHerdRegion>
        <LIAHerdCode>?</LIAHerdCode>
        <LIAIdentificationYear>?</LIAIdentificationYear>
        <LIAIdentificationTagOrTattoo>?</LIAIdentificationTagOrTattoo>
      </LivestockImprovementAssociationIdentifier>
      <HerdbookIdentifier>
        <HerdbookNumber>?</HerdbookNumber>
        <HerdbookAnimalSex>?</HerdbookAnimalSex>
        <BreedSociety>?</BreedSociety>
      </HerdbookIdentifier>
      <ArtificialBreedingCode>?</ArtificialBreedingCode>
      <AnimalHealthBoardIdentifier>
        <AHBNumber>?</AHBNumber>
        <AHBYearOfTag>?</AHBYearOfTag>
        <AHBSerialNumber>?</AHBSerialNumber>
      </AnimalHealthBoardIdentifier>
      <InternationalIdentifier>
        <CountryCode>?</CountryCode>
        <InternationalIdentification>?</InternationalIdentification>
      </InternationalIdentifier>
      <SexTypeCode>?</SexTypeCode>
      <DateOfBirth>?</DateOfBirth>
       <DateOfBirthConfidenceIndicatorTypeCode>?</DateOfBirthConfidenceIndicatorTypeC</pre>
      ode>
      <CountryOfOriginCode>?</CountryOfOriginCode>
      <AnimalName>?</AnimalName>
      <BreedDistribution>
        <BreedTypeCode>?</BreedTypeCode>
        <Breed16th>?</Breed16th>
      </BreedDistribution>
      <GeneTest>
        <LocusTypeCode>?</LocusTypeCode>
        <AlleleTypeCode>?</AlleleTypeCode>
      </GeneTest>
    </WriteElements>
  </Animal>
</Event>
```

5.3.4.3 **Obsolescent Version 201304**

...

```
...
<Event>
  <Animal>
    <AnimalIdentification>
      <BirthIdentifier>
        <ParticipantCode>?</ParticipantCode>
        <YearOfTag>?</YearOfTag>
        <BirthIdentificationNumber>?</BirthIdentificationNumber>
      </BirthIdentifier>
      <LivestockImprovementAssociationIdentifier>
        <LIAHerdRegion>?</LIAHerdRegion>
        <LIAHerdCode>?</LIAHerdCode>
        <LIAIdentificationYear>?</LIAIdentificationYear>
        <LIAIdentificationTagOrTattoo>?</LIAIdentificationTagOrTattoo>
      </LivestockImprovementAssociationIdentifier>
      <HerdbookIdentifier>
```



```
<HerdbookNumber>?</HerdbookNumber>
        <HerdbookAnimalSex>?</HerdbookAnimalSex>
        <BreedSociety>?</BreedSociety>
      </HerdbookIdentifier>
      <ArtificialBreedingCode>?</ArtificialBreedingCode>
      <AnimalHealthBoardIdentifier>
        <AHBNumber>?</AHBNumber>
        <AHBYearOfTag>?</AHBYearOfTag>
        <AHBSerialNumber>?</AHBSerialNumber>
      </AnimalHealthBoardIdentifier>
      <InternationalIdentifier>
        <CountryCode>?</CountryCode>
        <InternationalIdentification>?</InternationalIdentification>
      </InternationalIdentifier>
      <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
    </AnimalIdentification>
    <WriteElements>
      <SexTypeCode>?</SexTypeCode>
      <DateOfBirth>?</DateOfBirth>
       <DateOfBirthConfidenceIndicatorTypeCode>?</DateOfBirthConfidenceIndicatorTypeC</pre>
      ode>
      <CountryOfOriginCode>?</CountryOfOriginCode>
      <AnimalName>?</AnimalName>
      <BreedDistribution>
        <BreedTypeCode>?</BreedTypeCode>
        <Breed16th>?</Breed16th>
      </BreedDistribution>
      <GeneTest>
        <LocusTypeCode>?</LocusTypeCode>
        <AlleleTypeCode>?</AlleleTypeCode>
      </GeneTest>
    </WriteElements>
  </Animal>
</Event>
```

5.3.5 Permissions

...

Only the CDP that is the "DIGAD Herd Recorder" for the AnimalIdentification can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

5.3.6 Retraction

If an AnimalEvent is retracted, only the AnimalDurableKey needs to be supplied. DIGAD will ensure all AnimalEvents for that animal are retracted irrespective of changes to the identification set over time, if any.

Once an Animal is retracted, the AnimalDurableKey used to identify that Animal cannot be used to send further event data about the Animal. Events sent for retracted Animals will not be processed into DIGAD.



5.4 AnimalOfficialABCodeEvent

5.4.1 Overview

"AnimalOfficialABCodeEvent" describes the official artificial breeding code attribute of an animal, as defined by the AB enrolment system operator NZAEL. A herd recorder's understanding of an animal's artificial breeding code is captured in the AnimalEvent.

This event supplies an attribute of the animal object thus the "retract" action is not valid. The EventInstruction element must be "write".

This event is restricted to the NZAEL CDP.

5.4.2 Versions

201501: current version described in this document

5.4.3 Data Descriptions

Element	cardinality	business rules
Animal	1	All fields should be populated if data exists and is relevant . Absence of data will be inferred as a "deletion".
AnimalDurableKey	1	Identifier set of the subject animal.
WriteElements	1	required
ArtificialBreedingCode	0 or 1	
DateOfABCodeAllocation	0 or 1	This element must be populated in tandem with the ArtificialBreedingCode element.

5.4.4 XML Example

5.4.5 Retraction

This event may not be retracted. The EventInstruction element must be "write".



5.5 HerdEvent

5.5.1 Overview

"HerdEvent" describes a herd and its identifiers.

5.5.2 Versions

201304: current version described in this document

5.5.3 Data Descriptions

element	cardinality	business rules
Herd	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
Herdldentification	1	Identifier set of the subject herd. All industry identifiers and the CDP's herd identifier must be supplied.

5.5.4 XML Example

5.5.5 Retraction

If a HerdEvent is retracted, all the herd's current identifiers should be specified in the *HerdIdentification* set. DIGAD will ensure all HerdEvents for that herd are retracted irrespective of changes to the identification set over time, if any.



5.6 LocationEvent

5.6.1 Overview

"LocationEvent" describes a location and its identifiers.

5.6.2 Versions

201304: current version described in this document

5.6.3 Data Descriptions

element	cardinality	business rules
Location	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
LocationIdentification	1	Identifier set of the subject location. All industry identifiers must be supplied.
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
SpatialDescription	1 to many	
SpatialContextTypeCode	1	refer section 13 "Reference Data"
SpatialContent	1 to many	
VectorSpaceTypeCode	1	refer section 13 "Reference Data"
VectorSpaceMeasurementTypeCode	1	refer section 13 "Reference Data"
VectorSpace	1	
RoadEntranceDescription	0 or 1	

Repeating elements within the event are required to be unique. Uniqueness will be verified according to the constraint rules listed below.

constraint name	element key field(s)	rule
SpatialDescriptionConstraint	SpatialContextTypeCode	within <i>Location</i> , only one <i>SpatialDescription</i> element is allowed per <u>SpatialContextTypeCode</u> value
SpatialContentConstraint	VectorSpaceTypeCode VectorSpaceMeasurementTypeCode	within SpatialDescription, only one SpatialContent element is allowed per combination of <u>VectorSpaceTypeCode</u> and <u>VectorSpaceMeasurementTypeCode</u> values

5.6.4 XML Example


5.6.5 Retraction

If a LocationEvent is retracted, all the location's current identifiers should be specified in the *LocationIdentification* set. DIGAD will ensure all LocationEvents for that location are retracted irrespective of changes to the identification set over time, if any.



5.7 ParticipantEvent

5.7.1 Overview

"ParticipantEvent" describes a participant and its identifiers. LIC has been allocated the range of Participant Code values up to and including VYYY. CRV has been allocate the trange of Participant Code values from WBBB up to and including WNN.

5.7.2 Versions

201304: current version described in this document

5.7.3 Data Descriptions

element	cardinality	business rules
Participant	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
ParticipantIdentification	1	Identifier set of the subject participant. All industry identifiers and the CDP's participant identifier must be supplied. If the identifiers do not match to a single DIGAD participant, except where the identifiers are all unknown and don't match any participant, business verification logic will take an action depending on the nature of the non-match / mismatch.
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
ParticipantDescription	0 or 1	

5.7.4 XML Example

```
...
<Event>
    <Participant>
        <ParticipantIdentification>
        <ParticipantCode>?</ParticipantCode>
        </ParticipantIdentification>
        <WriteElements>
        <ParticipantDescription>?</ParticipantDescription>
        </WriteElements>
        </Participant>
        </Participant>
        </Participant>
        ...
```

5.7.5 Retraction

If a ParticipantEvent is retracted, all the participant's current identifiers should be specified in the **ParticipantIdentification** set. DIGAD will ensure all ParticipantEvents for that participant are retracted irrespective of changes to the identification set over time, if any.



5.8 IndustryParticipantEvent

5.8.1 Overview

"IndustryParticipantEvent" describes an industry participant and its identifier.

Please note that there is one industry identifier only for industry participant, and there is no concept of a "CDP identifier". Consequently, there is no "industry participant identification" event because the industry identifiers cannot be changed.

5.8.2 Versions

201304: current version described in this document

5.8.3 Data Descriptions

element	cardinality	business rules
IndustryParticipant	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
IndustryParticipantIdentifier	1	Industry identifier of the subject industry participant.
		If the identifier does not match a DIGAD industry participant, except where the identifier is unknown and doesn't match any industry participant, business verification logic will take an action depending on the nature of the non- match / mismatch.
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
IndustryParticipantDescription	1	

5.8.4 XML Example

```
...
<Event>
    <IndustryParticipant>
        <IndustryParticipantIdentifier>?</IndustryParticipantIdentifier>
        <UriteElements>
        <IndustryParticipantDescription>?</IndustryParticipantDescription>
        </WriteElements>
        </IndustryParticipant>
        <//Event>
        ...
```

5.8.5 Retraction

If an IndustryParticipantEvent is retracted, all the industry participant's current identifiers should be specified in the *IndustryParticipantIdentification* set. DIGAD will ensure all IndustryParticipantEvents for that industry participant are retracted irrespective of changes to the identification set over time, if any.



5.9 Reference Data

Reference data directly informs the state of external objects referenced by DIGAD farming events.

Reference data will be recorded in DIGAD via a business process that will ensure alignment between the DIGAD database, event schema and AE model. Reference data will be managed using NZAEL administrative processes which do not invoke the CDP ingestion mechanism. Thus no "ReferenceDataEvent" has been implemented.



6 Farming Object Identification Events

Please note that farming object identifier events cannot be retracted.

The correct behaviour for changing farming object identifiers is always to send a "write" event. If an identifier has been incorrectly set by a prior event or is for any reason required to be changed, the identification event must be called with a "write" instruction to update the identifier.

If a farming object previously asserted is considered to not exist, the act of retracting the farming object will release the identifiers, and at that point may be used to identify other objects if so desired.

6.1 Animal Identification

There is no "Animal Identification" event. Herd Recorders must use their internal identifier (as CDPAnimalIdentifier) only, when sending Animal events and any other events that relate to Animals. Thus, the CDPAnimalIdentifier alone is authoritative and immutable.

In order to effect a change in Animal identifiers (excluding the CDPAnimalIdentifier), Herd Recorders should send an AnimalEvent and state the new identifier information as they would for any other attribute of the Animal.

DIGAD will not verify the uniqueness of Animal identifiers immediately when receiving Animal events. Uniqueness verification will consist of exception reporting, with long-standing duplicates reported to Herd Recorders for remediation.

6.1.1 Versions

201304: obsolescent version described fully in CDP specification 1.2.6

6.1.2 XML Examples

6.1.2.1 Obsolescent Version 201304

```
...
<Fvent>
  <AnimalIdentification>
    <CurrentAnimalIdentification>
      <BirthIdentifier>
        <ParticipantCode>?</ParticipantCode>
        <YearOfTag>?</YearOfTag>
        <BirthIdentificationNumber>?</BirthIdentificationNumber>
      </BirthIdentifier>
      <LivestockImprovementAssociationIdentifier>
        <LIAHerdRegion>?</LIAHerdRegion>
        <LIAHerdCode>?</LIAHerdCode>
        <LIAIdentificationYear>?</LIAIdentificationYear>
        <LIAIdentificationTagOrTattoo>?</LIAIdentificationTagOrTattoo>
      </LivestockImprovementAssociationIdentifier>
      <HerdbookIdentifier>
        <HerdbookNumber>?</HerdbookNumber>
        <HerdbookAnimalSex>?</HerdbookAnimalSex>
        <BreedSociety>?</BreedSociety>
      </HerdbookIdentifier>
      <ArtificialBreedingCode>?</ArtificialBreedingCode>
      <AnimalHealthBoardIdentifier>
        <AHBNumber>?</AHBNumber>
        <AHBYearOfTag>?</AHBYearOfTag>
        <AHBSerialNumber>?</AHBSerialNumber>
      </AnimalHealthBoardIdentifier>
      <InternationalIdentifier>
```



```
<CountryCode>?</CountryCode>
        <InternationalIdentification>?</InternationalIdentification>
      </InternationalIdentifier>
      <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
    </CurrentAnimalIdentification>
    <NewAnimalIdentification>
      <BirthIdentifier>
        <ParticipantCode>?</ParticipantCode>
        <YearOfTag>?</YearOfTag>
        <BirthIdentificationNumber>?</BirthIdentificationNumber>
      </BirthIdentifier>
      <LivestockImprovementAssociationIdentifier>
        <LIAHerdRegion>?</LIAHerdRegion>
        <LIAHerdCode>?</LIAHerdCode>
        <LIAIdentificationYear>?</LIAIdentificationYear>
        <LIAIdentificationTagOrTattoo>?</LIAIdentificationTagOrTattoo>
      </LivestockImprovementAssociationIdentifier>
      <HerdbookIdentifier>
        <HerdbookNumber>?</HerdbookNumber>
        <HerdbookAnimalSex>?</HerdbookAnimalSex>
        <BreedSociety>?</BreedSociety>
      </HerdbookIdentifier>
      <ArtificialBreedingCode>?</ArtificialBreedingCode>
      <AnimalHealthBoardIdentifier>
        <AHBNumber>?</AHBNumber>
        <AHBYearOfTag>?</AHBYearOfTag>
        <AHBSerialNumber>?</AHBSerialNumber>
      </AnimalHealthBoardIdentifier>
      <InternationalIdentifier>
        <CountryCode>?</CountryCode>
        <InternationalIdentification>?</InternationalIdentification>
      </InternationalIdentifier>
      <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
    </NewAnimalIdentification>
  </AnimalIdentification>
</Event>
```

...



6.2 HerdIdentificationEvent – Deprecated as of 1.4.3

6.2.1 Overview

"HerdIdentificationEvent" describes a change to a herd's identifiers. In order to effect change to a herd's identifiers, a CDP must specify all the identifiers currently in use for the herd, as well as specify the new set of herd identifiers in its entirety.

6.2.2 Versions

201304: current version described in this document

6.2.3 Data Descriptions

element	cardinality	business rules
Herdldentification	1	
CurrentHerdIdentification	1	The current identifier set of the subject herd.
		All known identifiers for the herd must be supplied (with the exception of any CDP system identifiers not enumerated by the CDP sending the message). The supplied identifiers are used to identify the herd.
		If the set of identifiers presented in the message does not equate to a single herd's set of identifiers as known to DIGAD, business verification logic will take an action depending on the nature of the non-match / mismatch.
NewHerdldentification	1	The new identifier set of the subject herd. The complete set of identifiers must be provided: any previously used identifiers not present in the new set will be disassociated with the herd.
		The new set of identifiers must be unknown to DIGAD and/or known but not in use with other herds. At least one industry identifier must be provided as well as the CDPHerdIdentifier.
		Please note the only method of disassociating a herd from all identifiers is to "retract" the animal using HerdEvent.

6.2.4 XML Example

Dairynz≥

...



6.3 LocationIdentificationEvent – Deprecated as of 1.4.3

6.3.1 Overview

"LocationIdentificationEvent" describes a change to a location's identifiers. In order to effect change to a location's identifiers, a CDP must specify all the identifiers currently in use for the location, as well as specify the new set of location identifiers in its entirety.

6.3.2 Versions

201304: current version described in this document

6.3.3 Data Descriptions

element	cardinality	business rules
LocationIdentification	1	
CurrentLocationIdentification	1	The current identifier set of the subject location.
		All known identifiers for the location must be supplied (with the exception of any CDP system identifiers not enumerated by the CDP sending the message). The supplied identifiers are used to identify the location.
		If the set of identifiers presented in the message does not equate to a single location's set of identifiers as known to DIGAD, business verification logic will take an action depending on the nature of the non-match / mismatch.
NewLocationIdentification	1	The new identifier set of the subject location. The complete set of identifiers must be provided: any previously used identifiers not present in the new set will be disassociated with the location.
		The new set of identifiers must be unknown to DIGAD and/or known but not in use with other locations. At least one industry identifier must be provided.
		Please note the only method of disassociating a location from all identifiers is to "retract" the animal using LocationEvent.



6.3.4 XML Example

```
...
<Event>
    <LocationIdentification>
        <CurrentLocationIdentification>
            <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
            <CDPLocationIdentifier>?</CDPLocationIdentification>
            <NewLocationIdentification>
            <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
            <CDPLocationIdentifier>?</NZMS1FarmGateIdentifier>
            <NewLocationIdentifier>?</NZMS1FarmGateIdentifier>
            </LocationIdentification>
            </LocationIdentification>
            </LocationIdentification>
            </LocationIdentification>
            </LocationIdentification>
            </LocationIdentification>
            <//Event>
...
```



6.4 ParticipantIdentificationEvent – Deprecated as of 1.4.3

6.4.1 Overview

"ParticipantIdentificationEvent" describes a change to a participant's identifiers. In order to effect change to a participant's identifiers, a CDP must specify all the identifiers currently in use for the participant, as well as specify the new set of participant identifiers in its entirety.

6.4.2 Versions

201304: current version described in this document

6.4.3 Data Descriptions

element	cardinality	business rules
Participant	1	
CurrentParticipantIdentification	1	The current identifier set of the subject participant.
		All known identifiers for the participant must be supplied (with the exception of any CDP system identifiers not enumerated by the CDP sending the message). The supplied identifiers are used to identify the participant.
		If the set of identifiers presented in the message does not equate to a single participant's set of identifiers as known to DIGAD, business verification logic will take an action depending on the nature of the non-match / mismatch.
NewParticipantIdentification	1	The new identifier set of the subject participant. The complete set of identifiers must be provided: any previously used identifiers not present in the new set will be disassociated with the participant.
		The new set of identifiers must be unknown to DIGAD and/or known but not in use with other participants. At least one industry identifier must be provided.
		Please note the only method of disassociating a participant from all identifiers is to "retract" the animal using ParticipantEvent.



6.4.4 XML Example



7 Farming Object Relationship Events

7.1 AnimalHerdStartEvent

7.1.1 Overview

"AnimalHerdStartEvent" describes the start of an animal's relationship with a herd.

7.1.2 Versions

201906: new version which refers to Animal Durable Key201304: obsolescent version described fully in CDP specification 1.4.3

7.1.3 Data Descriptions

element	cardinality	business rules
AnimalHerdStart	1	
RelatedAnimalIdentification	1	The identifier set of the animal. If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch
DateOfAnimalHerdStart	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
RelatedHerdIdentification	1	The identifier set of the herd. If the identifiers do not all match to the same herd, business verification logic will take an action depending on the nature of the non- match / mismatch.
AnimalHerdRelationshipTypeCode	1	refer section 13 "Reference Data"

7.1.4 XML Examples

```
7.1.4.1 Current Version 201906
```

```
...
<Fvent>
  <AnimalHerdStart>
    <RelatedAnimalIdentification>
      <AnimalDurableKey>?</AnimalDurableKey>
    </RelatedAnimalIdentification>
    <DateOfAnimalHerdStart>?</DateOfAnimalHerdStart>
    <WriteElements>
      <RelatedHerdIdentification>
        <HerdLocationIdentifier>
          <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
          <HerdNumber>?</HerdNumber>
        </HerdLocationIdentifier>
      </RelatedHerdIdentification>
      <AnimalHerdRelationshipTypeCode>?</AnimalHerdRelationshipTypeCode>
    </WriteElements>
  </AnimalHerdStart>
</Event>
```



...

```
7.1.4.2 Obsolescent Version 201304
```

```
....
<Fvent>
  <AnimalHerdStart>
    <RelatedAnimalIdentification>
      <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
    </RelatedAnimalIdentification>
    <DateOfAnimalHerdStart>?</DateOfAnimalHerdStart>
    <WriteElements>
      <RelatedHerdIdentification>
        <HerdLocationIdentifier>
          <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
          <HerdNumber>?</HerdNumber>
        </HerdLocationIdentifier>
      </RelatedHerdIdentification>
      <AnimalHerdRelationshipTypeCode>?</AnimalHerdRelationshipTypeCode>
    </WriteElements>
  </AnimalHerdStart>
</Event>
...
```

7.1.5 Conflicting Date Ranges

No conflicting date ranges are allowed with existing AnimalHerdStartEvents or AnimalHerdEndEvents. If this is detected, then an error will be returned.

7.1.6 Retraction

If an AnimalHerdStartEvent is retracted, one or more of the related animal's and related herd's current identifiers should be specified in the *RelatedAnimalIdentification* and *RelatedHerdIdentification* sets respectively. DIGAD will ensure all AnimalHerdStartEvents for that animal and start date are retracted irrespective of changes to identification sets over time, if any.



7.2 AnimalHerdEndEvent

7.2.1 Overview

"AnimalHerdEndEvent" describes the end of an animal's relationship with a herd.

An animal/herd relationship need not have previously existed in DIGAD for the event to be successfully processed.

7.2.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

7.2.3 Data Descriptions

element	cardinality	business rules
AnimalHerdEnd	1	
RelatedAnimalIdentification	1	The identifier set of the animal.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfAnimalHerdEnd	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
RelatedHerdIdentification	1	The identifier set of the herd.
		If the identifiers do not all match to the same herd, business verification logic will take an action depending on the nature of the non- match / mismatch.
AnimalHerdRelationshipTypeCode	1	refer section 13 "Reference Data"
FateTypeCode	0 or 1	refer section 13 "Reference Data"
CauseOfFateTypeCode	0 or 1	refer section 13 "Reference Data"



```
XML Examples
7.2.4
 7.2.4.1
         Current Version 201906
 ...
 <Event>
   <AnimalHerdEnd>
     <RelatedAnimalIdentification>
       <AnimalDurableKey>?</AnimalDurableKey>
     </RelatedAnimalIdentification>
     <DateOfAnimalHerdEnd>?</DateOfAnimalHerdEnd>
     <WriteElements>
       <RelatedHerdIdentification>
         <HerdLocationIdentifier>
           <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
           <HerdNumber>?</HerdNumber>
         </HerdLocationIdentifier>
       </RelatedHerdIdentification>
       <AnimalHerdRelationshipTypeCode>?</AnimalHerdRelationshipTypeCode>
     </WriteElements>
   </AnimalHerdEnd>
 </Event>
 ...
```

```
7.2.4.2 Obsolescent Version 201304
```

```
...
<Event>
  <AnimalHerdEnd>
    <RelatedAnimalIdentification>
      <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
    </RelatedAnimalIdentification>
    <DateOfAnimalHerdEnd>?</DateOfAnimalHerdEnd>
    <WriteFlements>
      <RelatedHerdIdentification>
        <HerdLocationIdentifier>
          <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
          <HerdNumber>?</HerdNumber>
        </HerdLocationIdentifier>
      </RelatedHerdIdentification>
      <AnimalHerdRelationshipTypeCode>?</AnimalHerdRelationshipTypeCode>
    </WriteElements>
  </AnimalHerdEnd>
</Event>
...
```

7.2.5 Conflicting Date Ranges

No conflicting date ranges are allowed with existing AnimalHerdStartEvents or AnimalHerdEndEvents. If this is detected, then an error will be returned.

7.2.6 Retraction

If an AnimalHerdEndEvent is retracted, one or more of the related animal's and related herd's current identifiers should be specified in the **RelatedAnimalIdentification** and **RelatedHerdIdentification** sets respectively. DIGAD will ensure all AnimalHerdEndEvents for that animal and end date are retracted irrespective of changes to identification sets over time, if any.



7.3 AnimalHerdManagementNumberStartEvent

7.3.1 Overview

"AnimalHerdManagementNumberStartEvent" describes the start of a period in which the animal is identified by a particular number within its current herd.

7.3.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

7.3.3 Data Descriptions

element	cardinality	business rules
AnimalHerdManagementNumberStart	1	
RelatedAnimalIdentification	1	The identifier set of the animal.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfAnimalHerdManagementNumberStart	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
RelatedHerdIdentification	1	The identifier set of the herd. If the identifiers do not all match to the same herd, business verification logic will take an action depending on the nature of the non- match / mismatch.
AnimalManagementNumber	1	

7.3.4 XML Examples

7.3.4.1 Current Version 201906

```
...
<Event>
  <AnimalHerdManagementNumberStart>
    <RelatedAnimalIdentification>
      <AnimalDurableKey>?</AnimalDurableKey>
    </RelatedAnimalIdentification>
    <DateOfAnimalHerdManagementNumberStart>?</DateOfAnimalHerdManagementNumberStart>
    <WriteElements>
      <RelatedHerdIdentification>
        <HerdLocationIdentifier>
          <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
          <HerdNumber>?</HerdNumber>
        </HerdLocationIdentifier>
      </RelatedHerdIdentification>
      <AnimalManagementNumber>?</AnimalManagementNumber>
    </WriteElements>
  </AnimalHerdManagementNumberStart>
</Event>
....
```

7.3.4.2 Obsolescent Version 201304

```
...
<Event>
  <AnimalHerdManagementNumberStart>
    <RelatedAnimalIdentification>
      <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
    </RelatedAnimalIdentification>
    <DateOfAnimalHerdManagementNumberStart>?</DateOfAnimalHerdManagementNumberStart>
    <WriteElements>
      <RelatedHerdIdentification>
        <HerdLocationIdentifier>
          <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
          <HerdNumber>?</HerdNumber>
        </HerdLocationIdentifier>
      </RelatedHerdIdentification>
      <AnimalManagementNumber>?</AnimalManagementNumber>
    </WriteElements>
  </AnimalHerdManagementNumberStart>
</Event>
...
```

7.3.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the **RelatedAnimalIdentification** can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

7.3.6 Conflicting Date Ranges

No conflicting date ranges are allowed with existing AnimalHerdManagementNumberStartEvents or AnimalHerdManagementNumberEndEvents. If this is detected, then an error will be returned.

7.3.7 Retraction

If an AnimalHerdManagementNumberStartEvent is retracted, one or more of the related animal's and related herd's current identifiers should be specified in the *RelatedAnimalIdentification* and *RelatedHerdIdentification* sets respectively. DIGAD will ensure all AnimalHerdManagementNumberStartEvents for that animal and start date are retracted irrespective of changes to identification sets over time, if any.



7.4 AnimalHerdManagementNumberEndEvent

7.4.1 Overview

"AnimalHerdManagementNumberEndEvent" describes the end of a period in which the animal is identified by a particular number within its current herd.

The animal need not previously have been identified by the management number within the herd for the event to be successfully processed.

7.4.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

element	cardinality	business rules
AnimalHerdManagementNumberEnd	1	
RelatedAnimalIdentification	1	The identifier set of the animal.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfAnimalHerdManagementNumberEnd	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
RelatedHerdIdentification	1	The identifier set of the herd. If the identifiers do not all match to the same herd, business verification logic will take an action depending on the nature of the non- match / mismatch.
AnimalManagementNumber	1	

7.4.4 XML Examples

7.4.4.1 Current Version 201906

```
...
<Event>
  <AnimalHerdManagementNumberEnd>
    <RelatedAnimalIdentification>
      <AnimalDurableKey>?</AnimalDurableKey>
    </RelatedAnimalIdentification>
    <DateOfAnimalHerdManagementNumberStart>?</DateOfAnimalHerdManagementNumberStart>
    <WriteElements>
      <RelatedHerdIdentification>
        <HerdLocationIdentifier>
          <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
          <HerdNumber>?</HerdNumber>
        </HerdLocationIdentifier>
      </RelatedHerdIdentification>
      <AnimalManagementNumber>?</AnimalManagementNumber>
    </WriteElements>
  </AnimalHerdManagementNumberEnd>
```



```
</Event>
...
        Obsolescent Version 201304
7.4.4.2
...
<Fvent>
  <AnimalHerdManagementNumberEnd>
    <RelatedAnimalIdentification>
      <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
    </RelatedAnimalIdentification>
    <DateOfAnimalHerdManagementNumberStart>?</DateOfAnimalHerdManagementNumberStart>
    <WriteElements>
      <RelatedHerdIdentification>
        <HerdLocationIdentifier>
          <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
          <HerdNumber>?</HerdNumber>
        </HerdLocationIdentifier>
      </RelatedHerdIdentification>
      <AnimalManagementNumber>?</AnimalManagementNumber>
    </WriteElements>
  </AnimalHerdManagementNumberEnd>
</Event>
...
```

7.4.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the *RelatedAnimalIdentification* can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

7.4.6 Conflicting Date Ranges

No conflicting date ranges are allowed with existing AnimalHerdManagementNumberStartEvents or AnimalHerdManagementNumberEndEvents. If this is detected, then an error will be returned.

7.4.7 Retraction

If an AnimalHerdManagementNumberEndEvent is retracted, one or more of the related animal's and related herd's current identifiers should be specified in the **RelatedAnimalIdentification** and **RelatedHerdIdentification** sets respectively. DIGAD will ensure all AnimalHerdManagementNumberEndEvents for that animal and end date are retracted irrespective of changes to identification sets over time, if any.



7.5 AnimalIndustryParticipantStartEvent

7.5.1 Overview

"AnimalIndustryParticipantStartEvent" describes the start of an animal's relationship with an industry participant.

This event is restricted to the NZAEL CDP.

7.5.2 Versions

201906: new version which refers to Animal Durable Key

201603: obsolescent version described fully in CDP specification 1.4.3 as 201304 (publishing error) **201304**: obsolescent version described fully in CDP specification 1.4.3

7.5.3 Data Descriptions

element	cardinality	business rules
AnimalIndustryParticipantStart	1	
RelatedAnimalIdentification	1	The identifier set of the animal.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
CDPIdentifier	1	The CDP associated with the RelatedIndustryParticipantIdentifier
RelatedIndustryParticipantIdentifier	1	The industry participant identifier.
		If the identifier does not match an industry participant business verification logic will take an action.
DateOfAnimaIndustryParticipantStart	1	
AnimalIndustryParticipantRelationshipTypeCode	1	refer section 13 "Reference Data"

7.5.4 XML Examples

7.5.4.1 Current Version 201906

DIGAD CDP Interface Specification for Herd Recorders

7.5.4.2 Obsolescent Version 201304

7.5.5 Retraction

If an AnimalIndustryParticipantStartEvent is retracted, one or more of the related animal's and related industry participant's current identifiers should be specified in the **RelatedAnimalIdentification** and **RelatedIndustryParticipantIdentifier** sets respectively. DIGAD will ensure all AnimalIndustryParticipantStartEvents for that animal, industry participant, start date and relationship type are retracted irrespective of changes to identification sets over time, if any.



7.6 AnimalIndustryParticipantEndEvent

7.6.1 Overview

"AnimalIndustryParticipantEndEvent" describes the end of an animal's relationship with an industry participant.

An animal/industry participant relationship need not have previously existed in DIGAD for the event to be successfully processed.

This event is restricted to the NZAEL CDP.

7.6.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

7.6.3 Data Descriptions

element	cardinality	business rules
AnimalIndustryParticipantEnd	1	
RelatedAnimalIdentification	1	The identifier set of the animal.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
Related Industry Participant I dentifier	1	The industry participant identifier.
		If the identifier does not match an industry participant business verification logic will take an action.
DateOfAnimaIndustryParticipantEnd	1	
AnimalIndustryParticipantRelationshipTypeCode	1	refer section 13 "Reference Data"

7.6.4 XML Examples

7.6.4.1 *Current Version 201906*

7.6.4.2 Obsolescent Version 201304

... <Event>

```
<AnimalIndustryParticipantEnd>

<RelatedAnimalIdentification>

<CDPIdentifier>?</CDPIdentifier>

<CDPAnimalIdentifier>?</CDPAnimalIdentifier>

</RelatedAnimalIdentification>

<RelatedIndustryParticipantIdentifier>?</RelatedIndustryParticipantIdentifier>

<DateOfAnimalIndustryParticipantEnd>?</DateOfAnimalIndustryParticipantEnd>

<AnimalIndustryParticipantRelationshipTypeCode>?</AnimalIndustryParticipantRelati

onshipTypeCode>

</AnimalIndustryParticipantEnd>

</Event>

...
```

7.6.5 Retraction

If an AnimalIndustryParticipantEndEvent is retracted, one or more of the related animal's and related industry participant's current identifiers should be specified in the **RelatedAnimalIdentification** and **RelatedIndustryParticipantIdentifier** sets respectively. DIGAD will ensure all AnimalIndustryParticipantEndEvents for that animal, industry participant, end date and relationship type are retracted irrespective of changes to identification sets over time, if any.



7.7 HerdIndustryParticipantStartEvent

7.7.1 Overview

"HerdIndustryParticipantStartEvent" describes the start of a herd's relationship with an industry participant.

7.7.2 Versions

201304: current version described in this document

7.7.3 Data Descriptions

element	cardinality	business rules
HerdIndustryParticipantStart	1	
RelatedHerdIdentification	1	The identifier set of the herd.
		If the identifiers do not all match to the same herd, business verification logic will take an action depending on the nature of the non- match / mismatch.
Related Industry Participant I dentifier	1	The industry participant identifier.
		If the identifier does not match an industry participant business verification logic will take an action.
DateOfHerdIndustryParticipantStart	1	
HerdIndustryParticipantRelationshipTypeCode	1	refer section 13 "Reference Data"

7.7.4 XML Example

...

```
<Event>

<HerdIndustryParticipantStart>

<RelatedHerdIdentification>

<HerdLocationIdentifier>

<NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>

<HerdNumber>?</HerdNumber>

</HerdLocationIdentifier>

</RelatedHerdIdentification>

<RelatedIndustryParticipantIdentifier>?</RelatedIndustryParticipantIdentifier>

<DateOfHerdIndustryParticipantStart>?</DateOfHerdIndustryParticipantStart>

<HerdIndustryParticipantRelationshipTypeCode>?</HerdIndustryParticipantRelationsh

ipTypeCode>

</HerdIndustryParticipantStart>

</Event>

...
```

7.7.5 Conflicting Date Ranges

No conflicting date ranges are allowed with existing HerdIndustryParticipantStartEvents or HerdIndustryParticipantEndEvents. If this is detected, then an error will be returned.



7.7.6 Retraction

If a HerdIndustryParticipantStartEvent is retracted, one or more of the related herd's and related industry participant's current identifiers should be specified in the **RelatedHerdIdentification** and **RelatedIndustryParticipantIdentifier** sets respectively. DIGAD will ensure all HerdIndustryParticipantStartEvents for that herd, industry participant, start date and relationship type are retracted irrespective of changes to identification sets over time, if any.



7.8 HerdIndustryParticipantEndEvent

7.8.1 Overview

"HerdIndustryParticipantEndEvent" describes the end of a herd's relationship with an industry participant.

A herd/industry participant relationship need not have previously existed in DIGAD for the event to be successfully processed.

7.8.2 Versions

201304: current version described in this document

7.8.3 Data Descriptions

element	cardinality	business rules
HerdIndustryParticipantEnd	1	
RelatedHerdIdentification	1	The identifier set of the herd.
		If the identifiers do not all match to the same herd, business verification logic will take an action depending on the nature of the non- match / mismatch.
RelatedIndustryParticipantIdentifier	1	The industry participant identifier.
		If the identifier does not match an industry participant business verification logic will take an action.
DateOfHerdIndustryParticipantEnd	1	
HerdIndustryParticipantRelationshipTypeCode	1	refer section 13 "Reference Data"

7.8.4 XML Example

7.8.5 Conflicting Date Ranges

No conflicting date ranges are allowed with existing HerdIndustryParticipantStartEvents or HerdIndustryParticipantEndEvents. If this is detected, then an error will be returned.



7.8.6 Retraction

If a HerdIndustryParticipantEndEvent is retracted, one or more of the related herd's and related industry participant's current identifiers should be specified in the **RelatedHerdIdentification** and **RelatedIndustryParticipantIdentifier** sets respectively. DIGAD will ensure all HerdIndustryParticipantEndEvents for that herd, industry participant, end date and relationship type are retracted irrespective of changes to identification sets over time, if any.



7.9 HerdLocationStartEvent

7.9.1 Overview

"HerdLocationStartEvent" describes the start of a herd's relationship with a location.

7.9.2 Versions

201304: current version described in this document

7.9.3 Data Descriptions

element	cardinality	business rules
HerdLocationStart	1	
RelatedHerdIdentification	1	The identifier set of the herd
		If the identifiers do not all match to the same herd, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfHerdLocationStart	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
RelatedLocationIdentification	1	The identifier set of the location. If the identifiers do not all match to the same location, business verification logic will take an action depending on the nature of the non- match / mismatch.
HerdLocationRelationshipTypeCode	1	refer section 13 "Reference Data"

7.9.4 XML Example

```
...
<Event>
  <HerdLocationStart>
   <RelatedHerdIdentification>
      <HerdLocationIdentifier>
        <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
        <HerdNumber>?</HerdNumber>
      </HerdLocationIdentifier>
    </RelatedHerdIdentification>
    <DateOfHerdLocationStart>?</DateOfHerdLocationStart>
    <WriteElements>
      <RelatedLocationIdentification>
        <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
      </RelatedLocationIdentification>
      <HerdLocationRelationshipTypeCode>?</HerdLocationRelationshipTypeCode>
    </WriteElements>
  </HerdLocationStart>
</Event>
•••
```



7.9.5 Retraction

If a HerdLocationStartEvent is retracted, one or more of the related herd's and related location's current identifiers should be specified in the **RelatedHerdIdentification** and **RelatedLocationIdentification** sets respectively. DIGAD will ensure all HerdLocationStartEvents for that herd and start date are retracted irrespective of changes to identification sets over time, if any.



7.10 HerdLocationEndEvent

7.10.1 Overview

"HerdLocationEndEvent" describes the end of a herd's relationship with a location.

A herd/location relationship need not have previously existed in DIGAD for the event to be successfully processed.

7.10.2 Versions

201304: current version described in this document

7.10.3 Data Descriptions

element	cardinality	business rules
HerdLocationEnd	1	
RelatedHerdIdentification	1	The identifier set of the herd
		If the identifiers do not all match to the same herd, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfHerdLocationEnd	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
RelatedLocationIdentification	1	The identifier set of the location. If the identifiers do not all match to the same location, business verification logic will take an
		action depending on the nature of the non- match / mismatch.
HerdLocationRelationshipTypeCode	1	refer section 13 "Reference Data"

7.10.4 XML Example

```
...
<Event>
  <HerdLocationEnd>
    <RelatedHerdIdentification>
      <HerdLocationIdentifier>
        <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
        <HerdNumber>?</HerdNumber>
      </HerdLocationIdentifier>
    </RelatedHerdIdentification>
    <DateOfHerdLocationEnd>?</DateOfHerdLocationEnd>
    <WriteElements>
      <RelatedLocationIdentification>
        <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
      </RelatedLocationIdentification>
      <HerdLocationRelationshipTypeCode>?</HerdLocationRelationshipTypeCode>
    </WriteElements>
  </HerdLocationEnd>
</Event>
...
```



7.10.5 Retraction

If a HerdLocationEndEvent is retracted, one or more of the related herd's and related location's current identifiers should be specified in the **RelatedHerdIdentification** and **RelatedLocationIdentification** sets respectively. DIGAD will ensure all HerdLocationEndEvents for that herd and end date are retracted irrespective of changes to identification sets over time, if any.



7.11 HerdParticipantStartEvent

7.11.1 Overview

"HerdParticipantStartEvent" describes the start of a herd's relationship with a participant.

7.11.2 Versions

201304: current version described in this document

7.11.3 Data Descriptions

element	cardinality	business rules
HerdLocationStart	1	
RelatedHerdIdentification	1	The identifier set of the herd
		If the identifiers do not all match to the same herd, business verification logic will take an action depending on the nature of the non-match / mismatch.
RelatedParticipantIdentification	1	The identifier set of the participant.
		If the identifiers do not all match to the same participant, business verification logic will take an action depending on the nature of the non-match / mismatch.
DateOfHerdParticipantStart	1	
HerdParticipantRelationshipTypeCode	1	refer section 13 "Reference Data"

7.11.4 XML Example

```
...
<Event>
  <HerdParticipantStart>
    <RelatedHerdIdentification>
      <HerdLocationIdentifier>
        <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
        <HerdNumber>?</HerdNumber>
      </HerdLocationIdentifier>
    </RelatedHerdIdentification>
    <RelatedParticipantIdentification>
      <ParticipantCode>?</ParticipantCode>
    </RelatedParticipantIdentification>
    <DateOfHerdParticipantStart>?</DateOfHerdParticipantStart>
    <HerdParticipantRelationshipTypeCode>?</HerdParticipantRelationshipTypeCode>
  </HerdParticipantStart>
</Event>
...
```

7.11.5 Retraction

If a HerdParticipantStartEvent is retracted, one or more of the related herd's and related participant's current identifiers should be specified in the **RelatedHerdIdentification** and **RelatedParticipantIdentification** sets respectively. DIGAD will ensure all HerdParticipantStartEvents for that herd, participant, start date and relationship type are retracted irrespective of changes to identification sets over time, if any.



7.12 HerdParticipantEndEvent

7.12.1 Overview

"HerdParticipantEndEvent" describes the end of a herd's relationship with a participant.

A herd/participant relationship need not have previously existed in DIGAD for the event to be successfully processed.

7.12.2 Versions

201304: current version described in this document

7.12.3 Data Descriptions

element	cardinality	business rules
HerdLocationEnd	1	
RelatedHerdIdentification	1	The identifier set of the herd
		If the identifiers do not all match to the same herd, business verification logic will take an action depending on the nature of the non- match / mismatch.
RelatedParticipantIdentification	1	The identifier set of the participant.
		If the identifiers do not all match to the same participant, business verification logic will take an action depending on the nature of the non-match / mismatch.
DateOfHerdParticipantEnd	1	
HerdParticipant Relationship Type Code	1	refer section 13 "Reference Data"

7.12.4 XML Example

```
...
<Event>
 <HerdParticipantEnd>
   <RelatedHerdIdentification>
      <HerdLocationIdentifier>
        <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
        <HerdNumber>?</HerdNumber>
     </HerdLocationIdentifier>
   </RelatedHerdIdentification>
   <RelatedParticipantIdentification>
      <ParticipantCode>?</ParticipantCode>
   </RelatedParticipantIdentification>
   <DateOfHerdParticipantEnd>?</DateOfHerdParticipantEnd>
   <HerdParticipantRelationshipTypeCode>?</HerdParticipantRelationshipTypeCode>
 </HerdParticipantEnd>
</Event>
```

```
...
```



7.12.5 Retraction

If a HerdParticipantEndEvent is retracted, one or more of the related herd's and related participant's current identifiers should be specified in the *RelatedHerdIdentification* and *RelatedParticpantIdentification* sets respectively. DIGAD will ensure all HerdParticipantEndEvents for that herd, participant, end date and relationship type are retracted irrespective of changes to identification sets over time, if any.



7.13 ParticipantIndustryParticipantStartEvent

7.13.1 Overview

"ParticipantIndustryParticipantStartEvent" describes the start of a participant's relationship with an industry participant.

7.13.2 Versions

201304: current version described in this document

7.13.3 Data Descriptions

element	cardinality	business rules
HerdIndustryParticipantStart	1	
RelatedParticipantIdentification	1	The identifier set of the participant.
		If the identifiers do not all match to the same participant, business verification logic will take an action depending on the nature of the non-match / mismatch.
RelatedIndustryParticipantIdentifier	1	The industry participant identifier.
		If the identifier does not match an industry participant business verification logic will take an action.
DateOfParticpantIndustryParticipantStart	1	
ParticipantIndustry Participant Relationship Type Code	1	refer section 13 "Reference Data"

7.13.4 XML Example

7.13.5 Retraction

If a ParticipantIndustryParticipantStartEvent is retracted, one or more of the related participant's and related industry participant's current identifiers should be specified in the **RelatedParticipantIdentification** and **RelatedIndustryParticipantIdentifier** sets respectively. DIGAD will ensure all ParticipantIndustryParticipantStartEvents for that participant, industry participant, start date and relationship type are retracted irrespective of changes to identification sets over time, if any.


7.14 ParticipantIndustryParticipantEndEvent

7.14.1 Overview

"ParticipantIndustryParticipantEndEvent" describes the end of a participant's relationship with an industry participant.

A herd/industry participant relationship need not have previously existed in DIGAD for the event to be successfully processed.

7.14.2 Versions

201304: current version described in this document

7.14.3 Data Descriptions

element	cardinality	business rules
HerdIndustryParticipantEnd	1	
RelatedParticipantIdentification	1	The identifier set of the participant.
		If the identifiers do not all match to the same participant, business verification logic will take an action depending on the nature of the non-match / mismatch.
RelatedIndustryParticipantIdentifier	1	The industry participant identifier.
		If the identifier does not match an industry participant business verification logic will take an action.
DateOfParticipantIndustryParticipantEnd	1	
ParticipantIndustryParticipantRelationshipTypeCode	1	refer section 13 "Reference Data"

7.14.4 XML Example

7.14.5 Retraction

If a ParticipantIndustryParticipantEndEvent is retracted, one or more of the related participant's and related industry participant's current identifiers should be specified in the **RelatedParticipantIdentification** and **RelatedIndustryParticipantIdentifier** sets respectively. DIGAD will ensure all ParticipantIndustryParticipantEndEvents for that participant, industry participant, end date and relationship type are retracted irrespective of changes to identification sets over time, if any.



8 Animal Trait Events

8.1 AnimalAncestryEvent

8.1.1 Overview

"AnimalAncestryEvent" describes an assertion, positive or negative, that has been made about an animal's ancestry.

The "ancestry" concept includes calves born to an embryo transfer recipient, where the recipient proves not to be the genetic dam. The terms "progeny", "ancestry" and "ancestor" are thus not completely accurate in all circumstances.

8.1.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

8.1.3	Data	Descriptions
-------	------	--------------

element	cardinality	business rules
AnimalAncestry	1	
ProgenyIdentification	1	The identifier set of the progeny animal.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
AncestorIdentification		The identifier set of the ancestor animal.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
AnimalAncestryTypeCode	1	refer section 13 "Reference Data"
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
OfficialIndicatorTypeCode	0 or 1	refer section 13 "Reference Data"

8.1.4 XML Examples

8.1.4.1 *Current Version 201906*



```
</AnimalAncestry>
 </Event>
 ...
         Obsolescent Version 201304
 8.1.4.2
 ...
 <Event>
   <AnimalAncestry>
     <ProgenyIdentification>
       <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
     </ProgenyIdentification>
     <AncestorIdentification>
       <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
     </AncestorIdentification>
     <AnimalAncestryTypeCode>?</AnimalAncestryTypeCode>
     <WriteElements>
       <OfficialIndicatorTypeCode>?</OfficialIndicatorTypeCode>
     </WriteElements>
   </AnimalAncestry>
 </Event>
 •••
8.1.5
      Permissions
```

Only the CDP that is the "DIGAD Herd Recorder" for the **ProgenyIdentification** can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

8.1.6 Retraction

If an AnimalAncestryEvent is retracted, one or more of the progeny's and ancestor's current identifiers should be specified in the **ProgenydIdentification** and **AncestorIdentification** sets respectively. DIGAD will ensure all AncestryEvents for that progeny, ancestor and ancestry type are retracted irrespective of changes to identification sets over time, if any.



8.2 ArtificialInseminationEvent

8.2.1 Overview

"ArtificialInseminationEvent" describes a single insemination to a cow.

8.2.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

8.2.3 Data Descriptions

element	cardinality	business rules
ArtificialInsemination	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
Cowldentification	1	The identifier(s) set of the cow that was inseminated. If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfArtificialInsemination	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
ArtificialInseminationBullIdentification	0 to many	The identifier set of the bull(s) whose semen was in the straw. Each bull must be specified once only.
MatingChargeTypeCode	0 or 1	refer section 13 "Reference Data"

Repeating elements within the event are required to be unique. Uniqueness will be verified according to the constraint rules listed below.

constraint name	element key field(s)	rule			
ArtificialInseminationBullIdentificati onConstraint	AnimalDurableKey	within A <i>rtificialIns</i> per <u>Anima</u> l	ArtificialInsemination seminationBullIdentification IDurableKey value	only element is	one allowed

8.2.4 XML Examples

8.2.4.1 Current Version 201906



```
</WriteElements>
  </ArtificialInsemination>
</Event>
...
8.2.4.2
        Obsolescent Version 201304
...
<Event>
  <ArtificialInsemination>
    <CowIdentification>
      <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
    </CowIdentification>
    <DateOfArtificialInsemination>?</DateOfArtificialInsemination>
    <WriteElements>
      <ArtificialInseminationBullIdentification>
        <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
      </ArtificialInseminationBullIdentification>
    </WriteElements>
  </ArtificialInsemination>
</Event>
...
```

8.2.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the *Cowldentification* can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

8.2.6 Retraction

If an ArtificalInseminationEvent is retracted, one or more of the cow's current identifiers should be specified in the *Cowldentification* set. DIGAD will ensure all ArtificialInseminationEvents for that cow and insemination date are retracted irrespective of changes to identification sets over time, if any.



8.3 BodyConditionInspectionEvent

8.3.1 Overview

"BodyConditionInspectionEvent" describes a single inspection of an animal during which the body condition score and potentially liveweight has been measured.

This event should not be used to describe the body condition score measured during a TOP inspection.

8.3.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

8.3.3 Data Descriptions

element	cardinality	business rules
BodyConditionInspection	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
Cowldentification	1	The identifier set of the cow that was inspected.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfInspection	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
Score	1	

8.3.4 XML Examples

8.3.4.1 Current Version 201906

8.3.4.2 Obsolescent Version 201304

```
...
<Event>
    <BodyConditionInspection>
        <CowIdentification>
        <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
        </CowIdentification>
```



```
<DateOfInspection>?</DateOfInspection>
<WriteElements>
<Score>?</Score>
</WriteElements>
</BodyConditionInspection>
</Event>
...
```

8.3.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the *Cowldentification* can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

8.3.6 Retraction

If a BodyConditionInspectionEvent is retracted, one or more of the cow's current identifiers should be specified in the *Cowldentification* set. DIGAD will ensure all BodyConditionInspectionEvents for that cow and inspection date are retracted irrespective of changes to identification sets over time, if any.



8.4 DryingOffEvent

8.4.1 Overview

"DryingOffEvent" describes the action of drying off a single cow.

8.4.2 Versions

201906: updated version described in this document – change Cowldentification to use AnimalDurableKey **201304**: obsolescent version described fully in CDP specification 1.4.3

8.4.3 Data Descriptions

element	cardinality	business rules
DryingOff	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
Cowldentification	1	The identifier set of the dried off cow. If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non-match / mismatch.
DateOfLactationDriedOff	1	Should be the same as the parturition date which corresponds to the current lactation.
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
DryingOffDate	0 or 1	
DryingOffReasonTypeCode	0 or 1	refer section 13 "Reference Data"

8.4.4 XML Examples

8.4.4.1 Current Version 201906

...

8.4.4.2 Obsolescent Version 201304

```
...
<Event>
    <DryingOff>
        <CowIdentification>
        <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
        </CowIdentification>
```

8.4.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the *Cowldentification* can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

8.4.6 Retraction

If a DryingOffEvent is retracted, one or more of the cow's current identifiers should be specified in the *Cowldentification* set. DIGAD will ensure all DryingOffEvents for that cow and lactation date are retracted irrespective of changes to identification sets over time, if any.



8.5 EmbryoTransferEvent

8.5.1 Overview

"EmbryoTransferEvent" describes a document that contains information about 1 to many embryo transfers that take place:

- on a single day,
- to 1 to many recipients in a single herd, and
- where the embryos have the same egg/semen donor

8.5.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

element	cardinality	business rules
EmbryoTransfer 1		All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
EmbryoImplantSerialNumber	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
EmbryoDonorldentification	1	The identifier set of the animal that donated the embryo.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non-match / mismatch.
EmbryoSireIdentification	1 to many	The identifier set of the sire(s) whose semen was used to conceive the embryo (either by AI or IVF).
		Each sire must be specified once only.
EmbryoRecipientIdentification	1 to many	The identifier set(s) of the animal(s) that received the embryo. If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non-match / mismatch.
DateOfEmbryoImplant	1	
EmbryoDonorDate	0 or 1	The date the donor animal was inseminated, or IVF was performed.
EmbryoRecoveryDate	0 or 1	The date the embryo was recovered from the donor animal or culture.

8.5.3 Data Descriptions

Repeating elements within the event are required to be unique. Uniqueness will be verified according to the constraint rules listed below.

constraint name	element key field(s)	rule
EmbryoSireIdentificationConstraint	AnimalDurableKey	within <i>EmbryoTransfer</i> only one <i>EmbryoSireIdentification</i> element is allowed per <u>AnimalDurableKey</u> value
EmbryoRecipientIdentificationConst raint	AnimalDurableKey	within <i>EmbryoTransfer</i> only one <i>EmbryoRecipientIdentification</i> element is allowed per <u>AnimalDurableKey</u> value



8.5.4 XML Examples

8.5.4.1 Current Version 201906

```
...
<Event>
  <EmbryoTransfer>
    <EmbryoImplantSerialNumber>?</EmbryoImplantSerialNumber>
    <WriteElements>
      <EmbryoDonorIdentification>
        <AnimalDurableKey>?</AnimalDurableKey>
      </EmbryoDonorIdentification>
      <EmbryoSireIdentification>
        <AnimalDurableKey>?</AnimalDurableKey>
      </EmbryoSireIdentification>
      <EmbryoRecipientIdentification>
        <AnimalDurableKey>?</AnimalDurableKey>
      </EmbryoRecipientIdentification>
      <DateOfEmbryoImplant>?</DateOfEmbryoImplant>
      <EmbryoDonorDate>?</EmbryoDonorDate>
      <EmbryoRecoveryDate>?</EmbryoRecoveryDate>
    </WriteElements>
  </EmbryoTransfer>
</Event>
```

```
...
```

8.5.4.2 Obsolescent Version 201304

```
...
<Event>
  <EmbryoTransfer>
   <EmbryoImplantSerialNumber>?</EmbryoImplantSerialNumber>
   <WriteElements>
      <EmbryoDonorIdentification>
        <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
      </EmbryoDonorIdentification>
      <EmbryoSireIdentification>
        <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
      </EmbryoSireIdentification>
      <EmbryoRecipientIdentification>
        <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
      </EmbryoRecipientIdentification>
      <DateOfEmbryoImplant>?</DateOfEmbryoImplant>
      <EmbryoDonorDate>?</EmbryoDonorDate>
      <EmbryoRecoveryDate>?</EmbryoRecoveryDate>
    </WriteElements>
  </EmbryoTransfer>
</Event>
```

```
...
```

8.5.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the *EmbryoDonorIdentification* can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

8.5.6 Retraction

If an EmbryoTransferEvent is retracted, DIGAD will ensure all historical EmbryoTransferEvents for that **EmbryoImplantSerialNumber** are retracted.





8.6 HerdTestEvent

8.6.1 Overview

"HerdTestEvent" describes a single herd test by a certified herd tester, where many cows are tested.

8.6.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

8.6.3 Data Descriptions

element	cardinality	business rules
HerdTest	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
TestedHerdIdentification	1	The identifier set of the herd that was herd tested.
		If the identifiers do not all match to the same herd, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfHerdTest	1	Identifies the subject herd's herd test.
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
PretestMilkingDateStamp	1	This must be a UTC datetime value (ISO-8601 format)
Test1DateStamp	1	This must be a UTC datetime value (ISO-8601 format)
Test2DateStamp	0 or 1	This must be a UTC datetime value (ISO-8601 format)
HerdTestResult	1 to many	
CowIdentification	1	Each cow must be specified once only.
HerdTestValidIndicator	1	refer section 13 "Reference Data"
MilkingInterval	0 or 1	
SampleRegimeTypeCode	1	refer section 13 "Reference Data"
AbnormalTestTypeCode	0 or 1	refer section 13 "Reference Data"
PMMilkVolume	0 or 1	
AMMilkVolume	0 or 1	
FatPercentage	0 or 1	
ProteinPercentage	0 or 1	
SomaticCellCount	1	
AverageNumberOfMilkings	1	

Repeating elements within the event are required to be unique. Uniqueness will be verified according to the constraint rules listed below.



constraint name	element key field(s)	rule				
HerdTestResultConstraint	AnimalDurableKey	within	HerdTestResult	only	one	Cowldentification
		elemen	t is allowed per <u>Ar</u>	nimalDu	urablek	<u>(ey</u> value



8.6.4 XML Examples

8.6.4.1 Current Version 201906

```
<Event>
  <HerdTest>
   <TestedHerdIdentification>
     <HerdLocationIdentifier>
        <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
        <HerdNumber>?</HerdNumber>
      </HerdLocationIdentifier>
    </TestedHerdIdentification>
    <DateOfHerdTest>?</DateOfHerdTest>
    <WriteElements>
     <PretestMilkingDateStamp>?</PretestMilkingDateStamp>
     <Test1DateStamp>?</Test1DateStamp>
     <Test2DateStamp>?</Test2DateStamp>
      <HerdTestResult>
       <CowIdentification>
          <AnimalDurableKey>?</AnimalDurableKey>
       </CowIdentification>
        <HerdTestValidIndicator>?</HerdTestValidIndicator>
        <MilkingInterval>?</MilkingInterval>
        <SampleRegimeTypeCode>?</SampleRegimeTypeCode>
        <AbnormalTestTypeCode>?</AbnormalTestTypeCode>
        <PMMilkVolume>?
        <AMMilkVolume>?</AMMilkVolume>
        <FatPercentage>?</FatPercentage>
        <ProteinPercentage>?</ProteinPercentage>
        <SomaticCellCount>?</SomaticCellCount>
        <AverageNumberOfMilkings>?</AverageNumberOfMilkings>
      </HerdTestResult>
    </WriteElements>
  </HerdTest>
</Event>
```

```
•••
```

8.6.4.2 Obsolescent Version 201304

```
....
<Event>
  <HerdTest>
    <TestedHerdIdentification>
      <HerdLocationIdentifier>
        <NZMS1FarmGateIdentifier>?</NZMS1FarmGateIdentifier>
        <HerdNumber>?</HerdNumber>
      </HerdLocationIdentifier>
    </TestedHerdIdentification>
    <DateOfHerdTest>?</DateOfHerdTest>
    <WriteElements>
      <PretestMilkingDateStamp>?</PretestMilkingDateStamp>
      <Test1DateStamp>?</Test1DateStamp>
      <Test2DateStamp>?</Test2DateStamp>
      <HerdTestResult>
        <CowIdentification>
          <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
        </CowIdentification>
        <HerdTestValidIndicator>?</HerdTestValidIndicator>
        <MilkingInterval>?</MilkingInterval>
```



DIGAD CDP Interface Specification for Herd Recorders

```
<SampleRegimeTypeCode>?</SampleRegimeTypeCode>
<AbnormalTestTypeCode>?</AbnormalTestTypeCode>
<PMMilkVolume>?</PMMilkVolume>
<AMMilkVolume>?</AMMilkVolume>
<FatPercentage>?</FatPercentage>
<ProteinPercentage>?</ProteinPercentage>
<SomaticCellCount>?</SomaticCellCount>
<AverageNumberOfMilkings>?</AverageNumberOfMilkings>
</HerdTestResult>
</HerdTest>
</Event>
...
```

8.6.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the *HerdIdentification* can an submit this event for that herd. Additionally, only the original CDP for this herd test can send subsequent updates for this event. Any other CDP will receive an error if they attempt to submit data for the herd test.

8.6.6 Retraction

If a HerdTestEvent is retracted, the herd's current identifiers should be specified in the *HerdIdentification* set. DIGAD will ensure all historical HerdTestEvents for that herd and herd test date are retracted irrespective of changes to identification sets over time, if any.



8.7 LiveweightInspectionEvent

8.7.1 Overview

"LiveweightInspectionEvent" describes a single inspection of an animal during which the liveweight and potentially the body condition score has been measured.

This event should not be used to describe liveweight measured during a TOP inspection.

8.7.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

8.7.3 Data Descriptions

element	cardinality	business rules
LiveweightInspection	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
Cowldentification	1	The identifier set of the cow weighed.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfInspection	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
Liveweight	1	The weight of subject animal.

8.7.4 XML Examples

8.7.4.1 Current Version 201906

...

8.7.4.2 Obsolescent Version 201304

8.7.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the *Cowldentification* can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

8.7.6 Retraction

If a LiveweightInspectionEvent is retracted, one or more of the cow's current identifiers should be specified in the *CowIdentification* set. DIGAD will ensure all LiveweightInspectionEvents for that cow and inspection date are retracted irrespective of changes to identification sets over time, if any.



8.8 NaturalMatingEvent

8.8.1 Overview

"NaturalMatingEvent" describes a single observed mating between a bull and a cow. Only *one* natural mating can be observed on a given day per cow.

8.8.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

8.8.3	Data	Descri	ptions
-------	------	--------	--------

element	cardinality	business rules
NaturalMating	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
Cowldentification	1	The identifier set of the mated cow.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non-match / mismatch.
DateOfNaturalMating	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
BullIdentification	0 or 1	The identifier set of the bull.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non-match / mismatch.

8.8.4 XML Examples

```
8.8.4.1 Current Version 201906
```

8.8.4.2 Obsolescent Version 201304

```
...
<Event>
<NaturalMating>
```

```
<CowIdentification>

<CDPAnimalIdentifier>?</CDPAnimalIdentifier>

</CowIdentification>

<DateOfNaturalMating>?</DateOfNaturalMating>

<WriteElements>

<BullIdentification>

<CDPAnimalIdentifier>?</CDPAnimalIdentifier>

</BullIdentification>

</WriteElements>

</NaturalMating>

</Event>

...
```

8.8.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the *Cowldentification* can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

8.8.6 Retraction

If a NaturalMatingEvent is retracted, one or more of the cow's current identifiers should be specified in the *Cowldentification* set. DIGAD will ensure all NaturalMatingEvents for that cow and mating date are retracted irrespective of changes to identification sets over time, if any.



8.9 ParturitionEvent

8.9.1 Overview

ParturitionEvent" describes a dam's act of birthing one or many calves.

8.9.2 Versions

201906: new version which refers to Animal Durable Key201501: obsolescent version described fully in CDP specification 1.4.3201304: obsolescent version described fully in CDP specification 1.2.6

8.9.3 Data Descriptions

element	cardinality	business rules
Parturition	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
DamIdentification	1	The identifier set of the dam that gave birth.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non-match / mismatch.
DateOfParturition	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
CalfCount	0 or 1	
CalvingDetail	1 to many	
CalfNumberWithinParturition	1	
SexTypeCode	0 or 1	refer section 13 "Reference Data"
CalvingActualIndicator	0 or 1	refer section 13 "Reference Data"
AbnormalCalvingCircumstancesTypeCode	0 or 1	refer section 13 "Reference Data"
CalvingAssistanceTypeCode	0 or 1	refer section 13 "Reference Data"
FateOfCalfTypeCode	0 or 1	refer section 13 "Reference Data"
<u>CommentTypeCode</u>	0 to many	refer section 13 "Reference Data"

Repeating elements within the event are required to be unique. Uniqueness will be verified according to the constraint rules listed below.

constraint name	element key field(s)	rule
CalvingDetailConstraint	CalfNumberWithinParturition	within <i>Parturition</i> , only one <i>CalvingDetail</i> element is allowed per <u>CalfNumberWithinParturition</u> value
CommentTypeCodeConstraint	CommentTypeCode	within <i>CalvingDetail</i> , only one <u>CommentTypeCode</u> is allowed per <u>CommentTypeCode</u> value



```
8.9.4
      XML Examples
 8.9.4.1 Current Version 201906
 ...
 <Event>
   <Parturition>
     <DamIdentification>
       <AnimalDurableKey>?</AnimalDurableKey>
     </DamIdentification>
     <DateOfParturition>?</DateOfParturition>
     <WriteElements>
       <CalfCount>?</CalfCount>
       <CalvingDetail>
         <CalfNumberWithinParturition>?</CalfNumberWithinParturition>
         <SexTypeCode>?</SexTypeCode>
         <CalvingActualIndicator>?</CalvingActualIndicator>
         <AbnormalCalvingCircumstancesTypeCode>?</AbnormalCalvingCircumstancesTypeCode
         >
         <CalvingAssistanceTypeCode>?</CalvingAssistanceTypeCode>
         <FateOfCalfTypeCode>?</FateOfCalfTypeCode>
         <CommentTypeCode>?</CommentTypeCode>
       </CalvingDetail>
     </WriteElements>
   </Parturition>
 </Event>
 ...
 8.9.4.2 Obsolescent Version 201501
 ...
 <Event>
   <Parturition>
     <DamIdentification>
       <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
     </DamIdentification>
     <DateOfParturition>?</DateOfParturition>
     <WriteElements>
       <CalfCount>?</CalfCount>
       <CalvingDetail>
         <CalfNumberWithinParturition>?</CalfNumberWithinParturition>
         <SexTypeCode>?</SexTypeCode>
         <CalvingActualIndicator>?</CalvingActualIndicator>
         <AbnormalCalvingCircumstancesTypeCode>?</AbnormalCalvingCircumstancesTypeCode
         >
         <CalvingAssistanceTypeCode>?</CalvingAssistanceTypeCode>
         <FateOfCalfTypeCode>?</FateOfCalfTypeCode>
         <CommentTypeCode>?</CommentTypeCode>
       </CalvingDetail>
     </WriteElements>
   </Parturition>
 </Event>
 ...
 8.9.4.3
        Obsolescent Version 201304
 ...
 <Event>
   <Parturition>
     <DamIdentification>
```

```
<CDPAnimalIdentifier>?</CDPAnimalIdentifier>
    </DamIdentification>
    <DateOfParturition>?</DateOfParturition>
    <WriteElements>
      <CalvingDetail>
        <CalfNumberWithinParturition>?</CalfNumberWithinParturition>
        <CalvingActualIndicator>?</CalvingActualIndicator>
        <AbnormalCalvingCircumstancesTypeCode>?</AbnormalCalvingCircumstancesTypeCode</pre>
        <CalvingAssistanceTypeCode>?</CalvingAssistanceTypeCode>
        <FateOfCalfTypeCode>?</FateOfCalfTypeCode>
        <CommentTypeCode>?</CommentTypeCode>
      </CalvingDetail>
    </WriteElements>
  </Parturition>
</Event>
...
```

8.9.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the *DamIdentification* can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

8.9.6 Retraction

If a ParturitionEvent is retracted, one or more of the dam's current identifiers should be specified in the **DamIdentification** set. DIGAD will ensure all ParturitionEvents for that dam and parturition date are retracted irrespective of changes to identification sets over time, if any.



8.10 RunWithBullStartEvent

8.10.1 Overview

"RunWithBullStartEvent" describes the beginning of the period in which a cow is run with a bull. If a cow was run with several bulls at the same time, several events would be required to describe the activity (However, only one bull can be specified per day).

8.10.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

8.10.3	Data	Descriptions	
--------	------	--------------	--

element	cardinality	business rules
RunWithBullStart	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
Cowldentification	1	The identifier set of the cow that ran with the bull.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfRunWithBullStart	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
BullIdentification	0 or 1	The identifier set of the bull that was running.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.

8.10.4 XML Examples

```
8.10.4.1 Current Version 201906
```



8.10.4.2 Obsolescent Version 201304

8.10.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the *Cowldentification* can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

8.10.6 Retraction

If a RunWithBullStartEvent is retracted, one or more of the cow's current identifiers should be specified in the *Cowldentification* set. DIGAD will ensure all RunWithBullStartEvents for that dam and start date are retracted irrespective of changes to identification sets over time, if any.



8.11 RunWithBullEndEvent

8.11.1 Overview

"RunWithBullEndEvent" describes the end of the period in which a cow is run with a bull. If a cow was run with several bulls at the same time, several events would be required to end the run with bull activity (However, only one bull can be specified per day).

8.11.2 Versions

201906: new version which refers to Animal Durable Key

201304: obsolescent version described fully in CDP specification 1.4.3

8.11.3 Data Descriptions

element	cardinality	business rules
RunWithBullEnd	1	All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
Cowldentification	1	The identifier set of the cow that ran with the bull.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfRunWithBullEnd	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
BullIdentification	0 or 1	The identifier set of the bull that was running.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.

8.11.4 XML Examples

8.11.4.1 Current Version 201906



8.11.4.2 Obsolescent Version 201304

8.11.5 Permissions

Only the CDP that is the "DIGAD Herd Recorder" for the *Cowldentification* can submit this event for that animal. Any other CDP will receive an error if they attempt to submit data for that animal.

8.11.6 Retraction

If a RunWithBullEndEvent is retracted, one or more of the cow's current identifiers should be specified in the *Cowldentification* set. DIGAD will ensure all RunWithBullEndEvents for that dam and end date are retracted irrespective of changes to identification sets over time, if any.



8.12 TraitsOtherThanProductionInspectionEvent

8.12.1 Overview

"TraitsOtherThanProductionInspectionEvent" describes a single inspection of an animal where multiple TOP traits have been scored.

8.12.2 Versions

202006: updated version specifically designed for BreedIT – JSON only

201906: legacy version which refers to Animal Durable Key. Used by LIC until BreedIT performs the TOP Admin role

201304: obsolescent version described fully in CDP specification 1.4.3

8.12.3 Data Descriptions - 202006

element	cardinality	business rules
TraitsOtherThanProductionInspection		All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
Cowldentification	1	The identifier set of the inspected animal.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfInspection	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
AEIncludeIndicator	0 or 1	refer section 13 "Reference Data"
TOPInspectorCode	0 or 1	
TOPYearOfInspection	0 or 1	
TOPScores	1 - 18	
TOPTraitTypeCode	1	refer section 13 "Reference Data"
Score	1	
TOPCommentCodes	0 to many	
ClassificationAward	0 or 1	
AdditionalNotes	0 or 1	

Repeating elements within the event are required to unique. Uniqueness will be verified according to the constraint rules listed below.

constraint name	element key field(s)	rule
TOPScoreConstraint	TOPTraitTypeCode	within <i>TraitsOtherThanProductionInspection</i> , only one <i>TOPScore</i> element is allowed per <u>TOPTraitTypeCode</u> value



8.12.4 Data Descriptions - 201906

element	cardinality	business rules
TraitsOtherThanProductionInspection		All fields should be populated if data exists. Absence of data will be inferred as a "deletion".
Cowldentification	1	The identifier set of the inspected animal.
		If the identifiers do not all match to the same animal, business verification logic will take an action depending on the nature of the non- match / mismatch.
DateOfInspection	1	
WriteElements	0 or 1	required for "writes" must not be supplied for "retracts"
AEIncludeIndicator	0 or 1	refer section 13 "Reference Data"
TOPInspectorCode	0 or 1	
TOPYearOfInspection	0 or 1	
TOPScore	1 - 18	
TOPTraitTypeCode	1	refer section 13 "Reference Data"
Score	1	

Repeating elements within the event are required to unique. Uniqueness will be verified according to the constraint rules listed below.

constraint name	element key field(s)	rule
TOPScoreConstraint	TOPTraitTypeCode	within <i>TraitsOtherThanProductionInspection</i> , only one <i>TOPScore</i> element is allowed per <u>TOPTraitTypeCode</u> value

8.12.5 JSON Examples

```
8.12.5.1 Current Version 202006
```

```
...
{
     "cowIdentification": {
            "animalDurableKey": 0
     "aeIncludeIndicator": 0,
"topInspectorCode": "string",
     "topYearOfInspection": "string",
     "topScores": [
            {
                   "topTraitTypeCode": 0,
                   "score": 0
            }
     ],
"topCommentCodes": [
            0
     ],
"classificationAward": "string",
     "additionalNotes": "string"
}
```



8.12.6 XML Examples

```
8.12.6.1 Current Version 201906
<Event>
  <TraitsOtherThanProductionInspection>
    <CowIdentification>
      <AnimalDurableKey>?</AnimalDurableKey>
    </CowIdentification>
    <DateOfInspection>?</DateOfInspection>
    <WriteElements>
      <AEIncludeIndicator>?</AEIncludeIndicator>
      <TOPInspectorCode>?</TOPInspectorCode>
      <TOPYearOfInspection>?</TOPYearOfInspection>
           <TOPScore>
             <TOPTraitTypeCode>AM</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>ST</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>MS</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>00</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>W</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>S</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>C</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>RA</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>RW</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>L</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>US</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
```

```
<TOPTraitTypeCode>FU</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>RU</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>FT</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>RT</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>UO</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>DC</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>BC</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
    </WriteElements>
  </TraitsOtherThanProductionInspection>
</Event>
```

```
8.12.6.2 Obsolescent Version 201304
```

...

...

```
<Event>
  <TraitsOtherThanProductionInspection>
    <CowIdentification>
      <CDPAnimalIdentifier>?</CDPAnimalIdentifier>
    </CowIdentification>
    <DateOfInspection>?</DateOfInspection>
    <WriteElements>
      <AEIncludeIndicator>?</AEIncludeIndicator>
      <TOPInspectorCode>?</TOPInspectorCode>
      <TOPYearOfInspection>?</TOPYearOfInspection>
           <TOPScore>
             <TOPTraitTypeCode>AM</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>ST</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>MS</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>00</TOPTraitTypeCode>
             <Score>?</Score>
```

```
</TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>W</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>S</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>C</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>RA</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>RW</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>L</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>US</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>FU</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>RU</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>FT</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>RT</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>UO</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>DC</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
           <TOPScore>
             <TOPTraitTypeCode>BC</TOPTraitTypeCode>
             <Score>?</Score>
           </TOPScore>
    </WriteElements>
  </TraitsOtherThanProductionInspection>
</Event>
```

...



8.12.7 Permissions

While LIC is performing the TOP Admin role, both BreedIT and LIC can submit this event for any animal. NOTE: due to the nature of DIGAD, the *last* data received for an animal will be the only record used by DIGAD e.g. If LIC post an updated TOP event for an animal, then previously stored BreedIT version will be ignored.

Once BreedIT performs the TOP Admin role, then only BreedIT will be able to submit this event for any animal.

Any other CDP will receive an error if they attempt to submit data for that animal.

8.12.8 Retraction

If a TraitsOtherThanProductionInspectionEvent is retracted, one or more of the cow's current identifiers should be specified in the **Cowldentification** set. DIGAD will ensure all TraitsOtherThanProductionInspectionEvents for that cow and inspection date are retracted irrespective of changes to identification sets over time, if any.



9 Outbound Data

If DIGAD detects that an animal has changed to being herd recorded by another CDP, a copy of the entire animal record will be made available for the new CDP. The new CDP will be able to import the animal data into their system.

This process allows a CDP to be fully synchronised with the state of the animal as stored in DIGAD.

9.1 Date Formatting Standards

Date and date+time values will be exported in ISO-8601 standard. Date values will not include time zone information and are implied to be the date at which the event was recorded.

9.2 Animal References

Given that an Animal can be a reasonably large JSON object and referenced several times in a single document they will use a local referencing mechanism. This mechanism will serialise Animal Identification structures by value the first time and then referring to the object subsequently.

Reference values will be written with a special "\$id" metadata property and later referred to using a "\$ref" metadata property to later refer to the id and indicate there is a reference. These "\$id" values serve no purpose outside of the document for which they are generated.

9.3 Outgoing API Data Types

The outgoing API defines datatypes for both the animal and the herd. These are used by various animal events when referring to either an animal or a herd.

9.3.1 Animal Identification

When referring to other animals through mating events or ancestry events, the new CDP may not have any record of the animal e.g. Sire or Dam.

The new CDP can choose to add related animal to their records, however unless they are the record keeper for the related animals, this data will not be used in DIGAD_PRESENTATION.

Element	Cardinality	Data	Notes
		Туре	
AnimalDurableKey	1	Long	
NAITIdentifier	0 to many	-	Any known NAIT Ids for this animal,
			including previously assigned ones
RFID	0 or 1*	String	Aka NAIT Eid.
			* At least one RFID or NAITVisualTagId is
			required
NAITVisualTagId	0 or 1*	String	* At least one RFID or NAITVisualTagId is
			required
CurrentForAnimal	1	Bool	Identifies if this NAIT tag is the one in use
			by the animal now
BirthIdentifier	0 or 1	-	
ParticipantCode	1	String	
YearOfTag	1	Int	
BirthIdenticationNumber	1	Int	
ArtificialBreedingCode	0 or 1	Int	This will be the code as recorded by MAB
AnimalHealthBoardIdentifier	0 or 1	-	
AHBNumber	1	Int	
AHBYearOfTag	0 or 1	Int	
AHBSerialNumber	1	Int	

9.3.1.1 Data to return



InternationalIdentification	0 or 1	String	Return the DIGAD version of the international id Non-core
HerdbookIdentifier	0 or 1	-	
HerdbookNumber	1	Int	
HerdbookAnimalSex	1	String	
BreedSociety	1	String	
LivestockImprovementAssociationIdentifier	0 or 1	-	
LIAHerdRegion	1	String	
LIAHerdCode	1	String	
LIAIdentificationYear	1	Int	
LIAIdentificationTagOrTattoo	1	String	
SexTypeCode	0 or 1	String	
DateOfBirth	0 or 1	Date	
DateOfBirthConfidenceIndicatorTypeCode	0 or 1	String	
CountryOfOriginCode	0 or 1	String	Non-core
AnimalName	0 or 1	String	Non-core
BreedDistribution	0 to many	-	
BreedTypeCode	1	String	
Breed16th	1	Int	

9.3.1 Herd Identification

A herd identification will consist of all known elements of a herd

9.3.1.1 Data to return

Element	Cardinality	Data	Notes
		Туре	
NZMS1FarmGateIdentifier	1	String	
HerdNumber	1	Int	

9.4 Animal Events

An event will be returned where the animal matches any of the event's animal identification field(s). Some events (e.g. EmbryoTransferEvent) contain more than one animal.

Where there can only be one animal for the event (e.g. DryingOffEvent), then the animal identification does not need to be returned and the record can be implied to only belong to the requested animal.

Where there is more than one animal for the event (e.g. NaturalMatingEvent), then all the animal identification fields will be returned.

9.4.1 Animal Herd Details

For the animal changing CDP: if it is in a current herd then relevant herd details will be provided for that animal.

This data is not provided for related animals; and no data is provided if the changing animal is not in a herd

Element	Cardinality	Data Type	Notes
HerdDetails	0 or 1	-	Only provided if the animal is in a
			current herd
HerdIdentification	1	Herd	The current herd for the animal
		Identification	



AnimalHerdStartDate	1	Date	The date the animal joined the current herd
AnimalManagementNumbers	0 to many	-	The history of management numbers for the animal while in this herd. Items will be provided as an ordered list
AnimalManagementNumber	1	Int	The animal management number assigned
StartDate	1	Date	The start date for the animal management number
EndDate	0 or 1	Date	The end date for the animal management number (if known)

9.4.2 Previous Animal Herd Details

For the animal changing CDP: any previous herd relationships and herd management numbers for each herd will be provided for that animal.

This data is not provided for related animals.

9.4.2.1	Data to return

Element	Cardinality	Data Type	Notes
HerdDetails	0 to many	-	The history of animal herd relationships. Items will be provided as an ordered list. There is no guaranteed "Start" or "End" sequence
HerdIdentification	1	Herd Identification	The herd for the animal
StartDate	1	Date	The start date for the animal herd relationship
EndDate	0 or 1	Date	The end date for the animal herd relationship (if known)
FateTypeCode	0 or 1	String	Only provided if an "EndDate" exists
CauseOfFateTypeCode	0 or 1	String	Only provided if an "EndDate" exists
AnimalManagementNumbers	0 to many	-	The history of management numbers for the animal while in this herd. Items will be provided as an ordered list
AnimalManagementNumber	1	Int	The animal management number assigned
StartDate	1	Date	The start date for the animal management number
EndDate	0 or 1	Date	The end date for the animal management number (if known)

9.4.3 AnimalAncestryEvent

By default, three levels of ancestry for the progeny are provided. No data is returned if the moving animal is an ancestor.

9.4.3.1 Data to return

Element	Cardinality	Data Type	Notes
ProgenyIdentification	1	Animal Identifier	


AncestorIdentification	0 or 1	Animal Identifier	
AnimalAncestryTypeCode	1	String	Non-core
OfficialIndicatorTypeCode	0 or 1	String	Non-core for dam

9.4.4 ArtificialInseminationEvent

9.4.4.1 Data to return

Element	Cardinality	Data Type	Notes
DateOfArtificialInsemination	1	Date	Date that the artificial insemination occurred
BullIdentification	1 to many	Animal	
		Identification	

9.4.5 BodyConditionInspectionEvent

Non-core event

9.4.5.1 Data to return

Element	Cardinality	Data	Notes
		Туре	
DateOfInspection	1	Date	The date of the body condition inspection
Score	1	Decimal	The body condition score

9.4.6 DryingOffEvent

9.4.6.1 Data to return

Element	Cardinality	Data	Notes
		Туре	
DateOfLactationDriedOff	1	Date	Matches the parturition date for this lactation
			Non-core
DryingOffDate	0 or 1	Date	The date of the drying off
DryingOffReasonTypeCode	0 or 1	String	The reason for drying off (optional)

9.4.7 EmbryoTransferEvent

9.4.7.1 Data to return

Element	Cardinality	Data Type	Notes
EmbryoImplantSerialNumber	1		
EmbryoDonorIdentification	1	Animal	
		Identification	
EmbryoSireIdentification	1 to many	Animal	
		Identification	
EmbryoRecipientIdentification	1 to many	Animal	
		Identification	
DateOfEmbryoImplant	1	Date	
EmbryoDonorDate	0 or 1	Date	Non-core
EmbryoRecoveryDate	0 or 1	Date	Non-core

9.4.8 HerdTestEvent

9.4.8.1 Data to return

The returned herd test result will be for *one* animal only



Element	Cardinality	Data Type	Notes
HerdIdentification	1	Herd	
		Identification	
DateOfHerdTest	1	Date	
PretestMilkingDateStamp	1	Datetime	
Test1DateStamp	1	Datetime	
Test2DateStamp	0 or 1	Datetime	
HerdTestResult	1 to many	-	
HerdTestValidIndicator	1	String	Non-core
MilkingInterval	0 or 1	String	Non-core
SampleRegimeTypeCode	1	String	Non-core
AbnormalTestTypeCode	0 or 1	String	
PMMilkVolume	0 or 1	Decimal	
AMMilkVolume	0 or 1	Decimal	
FatPercentage	0 or 1	Decimal	
ProteinPercentage	0 or 1	Decimal	
SomaticCellCount	1	Int	
AverageNumberOfMilkings	1	Decimal	

9.4.9 LiveweightInspectionEvent

Non-core event

9.4.9.1 Data to return

Element	Cardinality	Data	Notes
		Туре	
DateOfInspection	1	Date	The date of the inspection
Liveweight	1	Number	The weight of the animal

9.4.10 NaturalMatingEvent

9.4.10.1 Data to return

Element	Cardinality	Data Type	Notes
DateOfNaturalMating	1	Date	The date for the natural mating
BullIdentification	0 or 1	Animal	Identification for the bull (optional)
		Identification	

9.4.11 ParturitionEvent

9.4.11.1 Data to return

Element	Cardinality	Data	Notes
		Туре	
DateOfParturition	1	Date	The date of the parturition
CalfCount	0 or 1	Int	(optional)
			Non-core
CalvingDetail	1 to many	-	
CalfNumberWithinParturition	1	Int	Sequence number
SexTypeCode	0 or 1	String	(optional)
			Non-core
CalvingActualIndicator	0 or 1	String	(optional)
			Non-core
AbnormalCalvingCircumstancesTypeCode	0 or 1	String	(optional)
CalvingAssistanceTypeCode	0 or 1	String	(optional)



FateOfCalfTypeCode	0 or 1	String	(optional)
CommentTypeCode	0 to many	String	(optional)

9.4.12 RunWithBullEvent

Run with bull will be provided as an ordered list. There is no guaranteed "Start" or "End" sequence

9.4.12.1 Data to return

Element	Cardinality	Data Type	Notes
DateOfRunWithBull	1	Date	The date of the run with bull event
BullIdentification	0 or 1	Animal	Identification for the bull that was running (optional)
		Identification	
RunWithBullType	1	String	Either "Start" or "End"

9.4.13 TraitsOtherThanProductionInspectionEvent

Non-core event

9.4.13.1 Data to return

Element	Cardinality	Data	Notes
		Туре	
DateOfInspection	1	Date	
AEIncludeIndicator	0 or 1	String	
TOPInspectorCode	0 or 1	String	Participant code of the TOP inspector
TOPYearOfInspection	0 or 1	String	The season the TOP inspection took place
TOPScore	1 to 18	-	
TOPTraitTypeCode	1	String	
Score	1	Decimal	



10 List of Farm Events and XML Schemas

Event Name	Schema Root Node	Interface Schema Name	CDP version
AnimalAncestryEvent	RegisterAnimalAncestryEvent	RegisterAnimalAncestryEvent_201304_XML.xsd	1.2.6
AnimalEvent	RegisterAnimalEvent	RegisterAnimalEvent_201808_XML.xsd	1.4.0
		RegisterAnimalEvent_201501_XML.xsd	1.3.0
		RegisterAnimalEvent_201304_XML.xsd	1.2.6
AnimalHerdEndEvent	RegisterAnimalHerdEndEvent	RegisterAnimalHerdEndEvent_201304_XML.xsd	1.2.6
AnimalHerdManagementNumberEndEvent	RegisterAnimalHerdManagementNumberEndEvent	RegisterAnimalHerdManagementNumberEndEvent_201304_XML.xsd	1.2.6
AnimalHerdManagementNumberStartEvent	RegisterAnimalHerdManagementNumberStartEvent	RegisterAnimalHerdManagementNumberStartEvent_201304_XML.xsd	1.2.6
AnimalHerdStartEvent	RegisterAnimalHerdStartEvent	RegisterAnimalHerdStartEvent_201304_XML.xsd	1.2.6
AnimalIdentificationEvent	RegisterAnimalIdentificationEvent	{obsolescent}	1.3.0
		RegisterAnimalIdentificationEvent_201304_XML.xsd	1.2.6
AnimalIndustryParticipantEndEvent	RegisterAnimalIndustryParticipantEndEvent	RegisterAnimalIndustryParticipantEndEvent_201603_XML.xsd	1.3.3
AnimalIndustryParticipantStartEvent	RegisterAnimalIndustryParticipantStartEvent	RegisterAnimalIndustryParticipantStartEvent_201603_XML.xsd	1.3.3
AnimalOfficialABCodeEvent	RegisterAnimalOfficialABCodeEvent	ReigisterAnimalOfficialABCodeEvent_201501_XML.xsd	1.3.3
ArtificialInseminationEvent	RegisterArtificialInseminationEvent	RegisterArtificialInseminationEvent_201304_XML.xsd	1.2.6
BodyConditionInspectionEvent	RegisterBodyConditionInspectionEvent	RegisterBodyConditionInspectionEvent_201304_XML.xsd	1.2.6
DryingOffEvent	RegisterDryingOffEvent	RegisterDryingOffEvent_201304_XML.xsd	1.2.6
EmbryoTransferEvent	RegisterEmbryoTransferEvent	RegisterEmbryoTransferEvent_201304_XML.xsd	1.2.6
HerdEvent	RegisterHerdEvent	RegisterHerdEvent_201304_XML.xsd	1.2.6
HerdIdentificationEvent	RegisterHerdIdentificationEvent	RegisterHerdIdentificationEvent_201304_XML.xsd	1.2.6
HerdIndustryParticipantEndEvent	RegisterHerdIndustryParticipantEndEvent	RegisterHerdIndustryParticipantEndEvent_201304_XML.xsd	1.2.6
HerdIndustryParticipantStartEvent	RegisterHerdIndustryParticipantStartEvent	RegisterHerdIndustryParticipantStartEvent_201304_XML.xsd	1.2.6
HerdLocationEndEvent	RegisterHerdLocationEndEvent	RegisterHerdLocationEndEvent_201304_XML.xsd	1.2.6
HerdLocationStartEvent	RegisterHerdLocationStartEvent	RegisterHerdLocationStartEvent_201304_XML.xsd	1.2.6
HerdParticipantEndEvent	RegisterHerdParticipantEndEvent	RegisterHerdParticipantEndEvent_201304_XML.xsd	1.2.6
HerdParticipantStartEvent	RegisterHerdParticipantStartEvent	RegisterHerdParticipantStartEvent_201304_XML.xsd	1.2.6
HerdTestEvent	RegisterHerdTestEvent	RegisterHerdTestEvent_201304_XML.xsd	1.2.6
IndustryParticipantEvent	RegisterIndustryParticipantEvent	RegisterIndustryParticipantEvent_201304_XML.xsd	1.2.6
LiveweightInspectionEvent	RegisterLiveWeightInspectionEvent	RegisterLiveWeightInspectionEvent_201304_XML.xsd	1.2.6



Event Name	Schema Root Node	Interface Schema Name	CDP version
LocationEvent	RegisterLocationEvent	RegisterLocationEvent_201304_XML.xsd	1.2.6
LocationIdentificationEvent	RegisterLocationIdentificationEvent	RegisterLocationIdentificationEvent_201304_XML.xsd	1.2.6
NaturalMatingEvent	RegisterNaturalMatingEvent	RegisterNaturalMatingEvent_201304_XML.xsd	1.2.6
ParticipantEvent	RegisterParticipantEvent	RegisterParticipantEvent_201304_XML.xsd	1.2.6
ParticipantIdentificationEvent	RegisterParticipantIdentificationEvent	RegisterParticipantIdentificationEvent_201304_XML.xsd	1.2.6
ParticipantIndustryParticipantEndEvent	RegisterParticipantIndustryParticipantEndEvent	RegisterParticipantIndustryParticipantEndEvent_201304_XML.xsd	1.2.6
ParticipantIndustryParticipantStartEvent	RegisterParticipantIndustryParticipantStartEvent	RegisterParticipantIndustryParticipantStartEvent_201304_XML.xsd	1.2.6
ParturitionEvent	RegisterParturitionEvent	RegisterParturitionEvent_201501_XML.xsd	1.3.0
		RegisterParturitionEvent_201304_XML.xsd	1.2.6
RunWithBullEndEvent	RegisterRunWithBullEndEvent	RegisterRunWithBullEndEvent_201304_XML.xsd	1.2.6
RunWithBullStartEvent	RegisterRunWithBullStartEvent	RegisterRunWithBullStartEvent_201304_XML.xsd	1.2.6
TraitsOtherThanProductionInspectionEvent	RegisterTraitsOtherThanProductionInspectionEvent	RegisterTraitsOtherThanProductionInspectionEvent_201304_XML.xsd	1.2.6



11 Data Dictionary

element	data type	lead high/low values (bolded) & chars examples	
AbnormalCalvingCircumstancesTypeCode	{alphanumeric}1 – 255	no	
AbnormalTestTypeCode	{alphanumeric}1 – 255	no	
AEIncludeIndicator	{alphanumeric}1	no	
AHBNumber	{digit}1 - 7	no " 1 ", "9", "10", "99", "1 " 9999999 "	
AHBYearOfTag	yearYY	yes	" 00 ", "01", "10", " 99 "
AHBSerialNumber	{digit}1 - 4	no	" 1 ", "9", "10", "99", "100", " 9999 "
AlleleTypeCode	{alphanumeric}1 – 255	no	
AMMilkVolume	{digit}1 – 2, ".", digit	yes	" 0.0 ", "0.9", "1.0", "9.9", "10.0", " 99.9 "
AnimalAncestryTypeCode	{alphanumeric}1 – 255	no	
AnimalDurableKey	{numeric}1 – 18	no	
Animal Herd Relationship Type Code	{alphanumeric}1 – 255	no	
AnimalIndustryParticipantRelationshipTypeCode	{alphanumeric}1 – 255	no	
AnimalManagementNumber	{digit}1 – 5	yes	"00000", "1","999999"
AnimalName	{character}1 – 255	no	
ArtificialBreedingCode	{digit}1-10	no	" 1 ", "9", "10", "99", "100", " 9999999999 "
AverageNumberOfMilkings	{digit}, ".", {digit}2	yes	" 0.01 ", "0.99, "1.00", " 9.99 "
			1
BirthIdentificationNumber	{digit}1 - 5	no	" 1 ", "9", "10", "99", "100", " 99999 "
BirthIdentificationNumber Breed16th	{digit}1 - 5 {digit}1 - 2	no no	"1", "9", "10", "99", "100", "99999" "1", "9", "16"
BirthIdentificationNumber Breed16th BreedSociety	{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6	no no no	"1", "9", "10", "99", "100", "99999" "1", "9", "16"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode	{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255	no no no no	"1", "9", "10", "99", "100", "99999" "1", "9", "16"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode CalfCount	{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255 {digit}1	no no no no no	"1", "9", "10", "99", "100", "99999" "1", "9", "16" "1", "9"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode CalfCount CalfNumberWithinParturition	{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255 {digit}1 {digit}1	no no no no no no no	"1", "9", "10", "99", "100", "99999" "1", "9", "16" "1", "9" "1", "9"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode CalfCount CalfNumberWithinParturition CalvingActualIndicator	{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255 {digit}1 {digit}1 {digit}	no no no no no no no	"1", "9", "10", "99", "100", "99999" "1", "9", "16" "1", "9" "1", "9"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode CalfCount CalfNumberWithinParturition CalvingActualIndicator CalvingAssistanceTypeCode	<pre>{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255 {digit}1 {digit}1 {digit} {alphanumeric}1 - 255 }</pre>	no no no no no no no no	"1", "9", "10", "99", "100", "99999" "1", "9", "16" "1", "9" "1", "9"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode CalfCount CalfNumberWithinParturition CalvingActualIndicator CalvingAssistanceTypeCode CauseOfFateTypeCode	<pre>{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255 {digit}1 {digit}1 {digit} {alphanumeric}1 - 255 }</pre>	no	"1", "9", "10", "99", "100", "99999" "1", "9", "16" "1", "9" "1", "9" "1", "9"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode CalfCount CalfNumberWithinParturition CalvingActualIndicator CalvingAssistanceTypeCode CauseOfFateTypeCode CDPAnimalIdentifier	<pre>{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255 {digit}1 {digit}1 {digit} {alphanumeric}1 - 255 }</pre>	no	"1", "9", "10", "99", "100", "99999" "1", "9", "16" "1", "9" "1", "9" "1", "9"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode CalfCount CalfNumberWithinParturition CalvingActualIndicator CalvingAssistanceTypeCode CauseOfFateTypeCode CDPAnimalIdentifier CDPHerdIdentifier	<pre>{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255 {digit}1 {digit}1 {digit} {alphanumeric}1 - 255 }</pre>	no	"1", "9", "10", "99", "100", "99999" "1", "9", "16" "1", "9" "1", "9" "1", "9"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode CalfCount CalfNumberWithinParturition CalvingActualIndicator CalvingAssistanceTypeCode CauseOfFateTypeCode CDPAnimalIdentifier CDPHerdIdentifier	<pre>{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255 {digit}1 {digit}1 {digit} {alphanumeric}1 - 255 {alphanumer</pre>	no no	"1", "9", "10", "99", "100", "99999" "1", "9", "16" "1", "9" "1", "9" "1", "9"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode CalfCount CalfNumberWithinParturition CalvingActualIndicator CalvingAssistanceTypeCode CauseOfFateTypeCode CDPAnimalIdentifier CDPHerdIdentifier CDPLocationIdentifier CDPMessageIdentifier	{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255 {digit}1 {digit}2 {alphanumeric}1 - 255	no	"1", "9", "10", "99", "100", "99999" "1", "9", "16" "1", "9" "1", "9" "1", "9" "1", "9"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode CalfCount CalfNumberWithinParturition CalvingActualIndicator CalvingAssistanceTypeCode CauseOfFateTypeCode CDPAnimalIdentifier CDPLocationIdentifier CDPMessageIdentifier CDPParticipantIdentifier	{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255 {digit}1 {digit}1 {digit}2 {alphanumeric}1 - 255	no	"1", "9", "10", "99", "100", "99999" "1", "9", "16" "1", "9" "1", "9" "1", "9" "1", "9"
BirthIdentificationNumber Breed16th BreedSociety BreedTypeCode CalfCount CalfNumberWithinParturition CalvingActualIndicator CalvingAssistanceTypeCode CauseOfFateTypeCode CDPAnimalIdentifier CDPHerdIdentifier CDPHerdIdentifier CDPParticipantIdentifier CDPParticipantIdentifier	{digit}1 - 5 {digit}1 - 2 {alphanumeric}1 - 6 {alphanumeric}1 - 255 {digit}1 {digit}1 {digit}2 {alphanumeric}1 - 255	no	"1", "9", "10", "99", "100", "99999" "1", "9", "16" "1", "9" "1", "9"



element	data type lead high/low values (bolde chars examples		high/low values (bolded) & examples
CountryCode	country	no	
CountryOfOriginCode	country	no	
DateOfABCodeAllocation	date	no	
DateOfAnimalHerdEnd	date	no	
DateOfAnimalHerdStart	date	no	
DateOfAnimalHerdManagementNumberEnd	date	no	
DateOfAnimalHerdManagementNumberStart	date	no	
DateOfAnimaIndustryParticipantEnd	date	no	
DateOfAnimaIndustryParticipantStart	date	no	
DateOfArtificialInsemination	date	no	
DateOfBirth	date	no	
DateOfBirthConfidenceIndicatorTypeCode	{alphanumeric}1 – 255	no	
DateOfEmbryoImplant	date	no	
DateOfHerdIndustryParticipantEnd	date	no	
DateOfHerdIndustryParticipantStart	date	no	
DateOfHerdLocationEnd	date	no	
DateOfHerdLocationStart	date	no	
DateOfHerdParticipantEnd	date	no	
DateOfHerdParticipantStart	date	no	
DateOfHerdTest	date	no	
DateOfInspection	date	no	
DateOfLactationDriedOff	date	no	
DateOfNaturalMating	date	no	
DateOfParturition	date	no	
DateOfRunWithBullEnd	date	no	
DateOfRunWithBullStart	date	no	
DryingOffDate	date	no	
DryingOffReasonTypeCode	{alphanumeric}1 – 255	no	
EmbryoDonorDate	date	no	
EmbryoImplantSerialNumber	{digit}12	yes	
EmbryoRecoveryDate	date	no	
EventChangeTime	datetime	no	
EventInstruction	value must be "write" or "retract"	no	
FateOfCalfTypeCode	{alphanumeric}1 – 255	no	
FatPercentage	{digit}1 – ,4 ".", {digit}2	yes	" 0.00 ", "0.99", "1.00", "9.99", "10.00", " 9999.99 "
FateTypeCode	{alphanumeric}1 – 255	no	
HerdbookNumber	{alphanumeric}1 – 6	no	



element	data type lea cha		high/low values (bolded) & examples
HerdbookAnimalSex	{alphanumeric}1	no	
HerdIndustryParticipantRelationshipTypeCode	{alphanumeric}1 – 255	no	
HerdLocationRelationshipTypeCode	{alphanumeric}1 – 255	no	
HerdNumber	{digit}1 – 2	no	" 1 ", "9", "10", " 99 "
HerdParticipant Relationship Type Code	{alphanumeric}1 – 255	no	
HerdTestValidIndicator	{alphanumeric}1	no	
IndustryParticipantDescription	{character}1 – 255	no	
IndustryParticipantIdentifier	{alphanumeric}1 – 255	no	
InternationalIdentification	{character}1 – 12	yes	
LIAHerdCode	{digit}1-6	yes	" 1 ", "9", "10", "999"
LIAHerdRegion	{alphanumeric}1 – 3	no	
LIAIdentificationTagOrTattoo	{alphanumeric}6	no	
LIAIdentificationYear	year	yes	" 0000 ", "0001", "1000", " 9999 "
Liveweight	{digit}1-4, ".", digit	no	" 1.0 ", "100.0", " 9999.9 "
LocusTypeCode	{alphanumeric}1 – 255	no	
MarketingBreedTypeCode	{alphanumeric}1 – 255	no	
MatingChargeTypeCode	{alphanumeric}1 – 255	no	
MilkingInterval	{alphanumeric}1 – 255	no	
NAITIdentifier – RFID	-	-	See "NAIT – RFID"
NAITIdentifier – NAITVisualTagID	-	- See "NAIT – Visual Tag Id"	
NAITIdentifier – CurrentForAnimal	{boolean}	no	
NZMS1FarmGateIdentifier	New Zealand map series 1	no	
OfficialIndicatorTypeCode	{alphanumeric}1 – 255	no	
OriginatorIdentifier	-	-	see "IndustryParticipantIdentifier"
ParticipantCode	{uppercase alphabet excluding vowels}3 – 4	no	
ParticipantDescription	{character}1 – 255	no	
ParticipantIndustryParticipantRelationshipTypeCode	{alphanumeric}1 – 255	no	
PMMilkVolume	{digit}1 – 2, ".", digit	yes	" 0.0 ", "0.9", "1.0", "9.9", "10.0", " 99.9 "
PretestMilkingDateStamp	datetime	no	
ProteinPercentage	{digit}1 - 4, ".", {digit}2 ;	yes	" 0.00 ", "0.99", "1.00", "9.99", "10.00", " 9999.99 "
RegionTypeCode	{alphanumeric}1 – 255	no	
RoadEntranceDescription	{character}1 – 255	no	
SampleRegimeTypeCode	{alphanumeric}1 – 255	no	
Score	{digit}1, ".", {digit}2	yes	"0.10", "0.50","1.25", "9.90"



element	data type lead chars		high/low values (bolded) & examples	
SexTypeCode	{alphanumeric}1 – 255	no		
SomaticCellCount	{digit}1 - 5	yes	" 0 ", "9", "10", "99", "100", " 99999 "	
SpatialContextTypeCode	{alphanumeric}1 – 255 no			
Test1DateStamp	datetime	no		
Test2DateStamp	datetime	no		
TOPInspectorCode	{alphanumeric}1 - 255	no		
TOPTraitTypeCode	{alphanumeric}1 – 255	no	no	
TOPYearOfInspection	year	yes	" 1900 ", "2000", " 9999 "	
VectorSpace	{character}1 – 255	yes		
VectorSpaceMeasurementTypeCode	{alphanumeric}1 – 255	no		
VectorSpaceTypeCode	{alphanumeric}1 – 255	no		
YearOfTag	year	yes	" 0000 ", "0001", "0010", "19 99 "	



12 Data Formats

12.1 EBNF Notation Overview

The data type descriptions use Extended Backus-Naur Form (EBNF). An expression can be described using the following notation:

,
;
[]
{}*
{}+
{}n
{}m-n
()
"…"
(**)
any natural number > 1
any whole number < n

12.2 Internally Defined Data Formats

zero	::=	"0";
digit excluding zero	::=	"1" "2" "3" "4" "5" "6" "7" "8" "9" ;
digit	::=	zero digit excluding zero ;
numeric	::=	digit excluding zero, {digit}* ;
uppercase alphabet excluding vowels	::=	"B" "C" "D" "F" "G" "H" "J" "K" "L" "M" "N" "P" "Q" "R" "S" "T" "V" "W" "X" "Y" "Z" ;
uppercase vowels	::=	"A" "E" "I" "O" "U" ;
lower case alphabet	::=	$\label{eq:approx_alpha} \begin{array}{c} \mbox{``a"} \mid \mbox{``b"} \mid \mbox{``c"} \mid \mbox{``d"} \mid \mbox{``e"} \mid \mbox{``f"} \mid \mbox{``g"} \mid \mbox{``h"} \mid \mbox{``j"} \mid \mbox{``j"} \mid \mbox{``k"} \mid \mbox{``l"} \mid \mbox{``l"} \mid \mbox{``mv} \mid \mbox{``l"} \mid \mbox{``mv} \mid \mbox{``l"} \mid \mbox{`'l"} \mid \mbox{``l"} \mid \mbox{`'l"} \mid \mbox{''l"} \mid \mbox{`'l"} \mid \mbox{''l"} \mid$
uppercase alphabet	::=	uppercase alphabet excluding vowels uppercase vowels ;
alphabet	::=	uppercase alphabet lowercase alphabet ;
alphanumeric	::=	alphabet digit ;
year	::=	{digit}4;
yearYY	::=	{digit}2;
boolean	::=	"true" "false" ;



12.0 Externally Defined Data		
character	::=	(* ISO/IEC 10646 *)
date	::=	(* ISO 8601 extended format YYYY-MM-DD e.g. "2014-06-10" *)
		constraint in DIGAD database software
datetime	::=	(* ISO 8601 extended format with UTC offset YYYY-MM-DDTHH:MM:SS.000±HH:MM e.g. "2014-06-10T22:30:15.000+12:00" *)
		the earliest time is constrained to "1753-01- 01T00:00:00.000-13:00", due to a constraint in DIGAD database software
country	::=	(* ISO 3166-1 alpha 3 e.g. "NZL" represents "New Zealand" *)
New Zealand map series 1	::=	(* imperial NZMS 1 format comprises a map designation followed by a 6 digit coordinate set e.g. "N075341005" *)

12.4 NAIT Data Formats

The NAIT Data Formats below were extracted from NAIT's "Animal Interface Specification v1.10" documentation. These formats are listed here for reference purposes only: DIGAD will not validate the format of any provided NAIT data and is only used by DIGAD for animal identification comparisons.

The RFID value will be converted to a numeric value for comparison (with leading zeros and spaces removed).

12.4.1 RFID

NAIT stores and displays the RFID in the following format:

• mmm nnnnnnnnnn

mmm is the ICAR Code: 942, 951 or 982

nnnnnnnnn is a 12-digit unique serial number (RFID)

RFIDs can be entered in any of the following formats:

- 00000 0 982 000196588496
- 942 000002422333
- 982009104641361
- 982 000161531687
- 0982000190869343
- 0982 000190869343

12.4.2 Visual Tag Id

Must be one of the following formats

Format

Example



Participant code with year	pppp-yy-nnnn	GRTY-12-1235	
Participant code with sequence	pppp-nnnnn	GRTY-123	
only			
AHB herd number with year	aaaaaaa-yy-nnnnn	4546574-12-1235	
AHB herd number with	aaaaaaa-nnnnnn	4463725-1235	
sequence only			
NAIT number with sequence	AAAAAAAA-nnnnn	12345678-123456	
only			
NAIT number with year	AAAAAAAA-yy-nnnnn	12345678-16-123456 AHB	
Traka tag	mmm-NNNNNNNNNNNaaaaaaa	951-000012345123-5454455	
Participant code Traka tag	mmm-NNNNNNNNNNNpppp	951-000012345123-GRTY	
NAIT number Traka tag	mmm-NNNNNNNNNNNAAAAAAAA	951-000012345123-12345678	
Participant code Management	mmm-NNNNNNNNNNNpppp-nnnnn	951-000012345123-GRTY-454	
tag			

Where:

- aaaaaaa = AHB herd number (7 digits)
- pppp = Participant code (2 4 alpha characters, but not A,E,I,O,U,S)
- AAAAAAAA = NAIT number (2 6 or 8 digits)
- mmm = Manufacturer's ICAR code
- nnnnn = Sequence number (1 6 digits)
- NNNNNNNNNN = Number part of RFID (12 digits)
- yy = Year (2 digits)

Dashes are used as separators between ID components.



13 Reference Data Values

Reference Data Type	Code Values	Reference Data Description
AbnormalCalvingCircumstancesTypeCode	А	aborted
	I	induced
	Р	premature
AbnormalTestTypeCode	1	insufficient sample
	2	farm anomaly
	3	animal in season
	4	animal held milk
	5	herd tester processing anomaly
	7	animal running with calves
	8	animal sick
	9	contaminated sample
AEIncludeIndicator	N	no
	Y	yes
AlleleTypeCode	+	positive
	-	negative
AnimalAncestryTypeCode	D	is progeny of the dam
	S	is progeny of the sire
	R	was calved by the embryo transfer recipient
AnimalHerdRelationshipTypeCode	м	is a member of
AnimalIndustryParticipantRelationshipTypeCode	AE	is enrolled for AE services
	HR	is Herd Recorded by
BreedTypeCode	ABC	Aubrac
	ABO	Abondance
	AFR	Africander
	AGL	Angler
	AKW	Ankole Watusi
	ANG	Angus
	ANL	Angus-Lowline
	AUL	Australian Lowline
	AUR	Australian Red
	AYR	Ayrshire
	BAZ	Bazadaise
	BEB	Beefblend
	BEF	Beefalo
	BFM	Beefmaster
	BGB	Belgian Blue



Reference Data Type	Code Values	Reference Data Description
	BLA	Blaarkop
	BLO	Blond D'Aquitane
	BMR	Belmont Red
	BON	Boran
	BRF	Braford
	BRH	Brahman
	BRN	Brangus
	BRS	Brown Swiss
	BRV	Braunvieh
	BUF	Buffalo
	BWH	British White
	СНА	Charolais
	СНІ	Chianina
	СМР	Composite
	CRO	Cross
	DAR	Danish Red
	DEV	Devon
	DEX	Dexter
	DRG	Dairy Gir
	DRO	Droughtmaster
	DUB	Dutch Belted
	DUR	Durham
	ELH	English Longhorn
	END	Enderby Island
	FRI	Friesian
	GAB	Galloway-Belted
	GAL	Galloway
	GAS	Gasconne
	GAW	Galloway White
	GIR	Gir
	GRL	Girolando
	GEL	Gelbvieh
	GRY	Greyman
	GUC	Guernsey – Canadian
	GUE	Guernsey
	HAY	Hays Converter
	HEM	Mniature Hereford
	HEP	Hereford – Polled



Reference Data Type	Code Values	Reference Data Description
	HEQ	Hereford – Horned
	HER	Hereford
	HEW	Hereford - White
	HIN	Hinterwald
	ним	Hummel
	JER	Jersey
	KER	Kerry
	LIM	Limousin
	LIN	Lincoln
	LOH	Longhorn
	LUI	Luing
	MAI	Maine-Anjou
	MAN	Mandalong Special
	MAR	Marchigiana
	MBL	Montbeliard
	MEU	Meuse-Rhine-Yssel
	MGL	Miniature Galloway
	MSC	Minisature Scottish Highland
	MSH	Mashona
	MUG	Murray Grey
	NRM	Normande
	NWR	Norwegian Red
	NZG	New Zealand Grey
	PAR	Parthenais
	PID	Piedmontese
	PIN	Pinzgauer
	PIR	Pie Rouge
	PST	Pustertaler
	RAG	Rangemaker
	RAN	Angus – Red
	RED	Devon - Red
	REP	Red Poll
	RFL	Rouge Flamande
	ROM	Romagnola
	ROT	Rotbut
	RSI	Red Sindi
	SAH	Sahiwal
	SAL	Salers



Reference Data Type	Code Values	Reference Data Description
	SAN	Santa Gertrudis
	SAX	Sahiwal X
	sco	Scottish Highland
	SEN	Senepol
	SFV	Simmental Fleckvieh
	SHB	Shorthorn Beef
	SHF	Shorthorn Beef – Polled
	SHI	Shorthorn Aust Illawara
	SHM	Milking Shorthorn
	SHP	Shorthorn Polled
	SHV	Shaver
	SIM	Simmental
	SIP	Simmental – Polled
	SOD	South Devon
	SPP	Speckle Park
	STA	Stabilizer
	sus	Sussex
	SWR	Swedish Red
	TAG	Tasmanian Grey
	TAR	Tarantaise
	TUL	Tuli
	WAG	Wagyu
	WEB	Welsh Black
	ҮАК	Yak
	ZBU	Zebu – Milking
	ZEB	Zebu – Beef
CalvingActualIndicator	0	actual
	1	estimated
CalvingAssistanceTypeCode	1	reported - no assistance given
	2	minor assistance
	3	major assistance
CauseOfFateTypeCode	A7	store
	A8	slaughter
	АВ	abortion
	AP	parent performance
	BL	bloat
	BR	brucellosis
	BV	BVD



Reference Data Type	Code Values	Reference Data Description
	BQ	blind quarter
	CA	cast
	CL	cull to layoff
	CN	cancer
	CR	catarrh
	СТ	calving trouble (including septicaemia)
	DC	redundant 1.8.91 refer TC
	DR	drowned
	DU	died – cause unknown
	EB	EBL
	EC	eczema
	EL	electrocution
	EX	export
	FE	facial eczema
	FP	failed parentage test
	FT	feet or leg problems
	FV	failed veterinary examination
	GS	rye grass staggers
	НВ	heritable defect in bull
	HD	heritable defect in dam
	ні	humane – injury
	нм	hermaphrodite
	НР	heritable defect in progeny
	HS	humane – sickness
	HU	undershot jaw
	IA	injury or accident
	IB	IBR
	IF	infertility or poor fertility
	IN	injured
	JD	Johne's Disease
	кт	ketosis
	LC	late calver
	LF	low fertility
	LG	leg problems
	LL	low libido – poor service behaviour
	LM	lame
	LP	low production
	LS	leptospirosis



Reference Data Type	Code Values	Reference Data Description
	LT	listerioisis
	MA	mastitis
	MB	M. bovis
	MF	milk fever
	MS	magnesium staggers
	MT	empty
	NP	natural proof below standard
	NS	unsatisfactory or non-server
	OA	old age
	ос	other causes
	OD	other diseases
	ОМ	other metabolic disease
	РВ	physical defect in bull
	PM	pneumonia
	РР	physical defect in progeny
	PR	AB proof not up to standard
	РТ	progeny test below standard
	SA	salmonella
	SC	high somatic cell count
	SD	redundant 1.8.91 refer SI
	SE	spring eczema
	SI	culled/died sickness or disease
	SK	sucker
	SM	slow milker
	SO	scours
	SP	sire's proof below standard
	SQ	semen quality
	SR	surplus to requirements
	ST	surplus to requirements (BW & TOP)
	ТВ	tuberculosis
	тс	TOP conformation
	TE	unsuitable temperament
	ТН	teeth
	TL	Theileria
	TM	TOP management
	ТР	redundant 1.8.91 refer TM
	TR	traits other than production
	TT	three teater



Reference Data Type	Code Values	Reference Data Description
	ТҮ	unsuitable type
	UD	udder breakdown
	UK	unknown
	UT	unsuitable udder/teats
	WG	weight gain below standard
	Y	dried off
CommentTypeCode	АВ	aborted
	BD	brain damaged/retarded/spastic
	BI	bowel or intestine abnormality
	BL	blind
	BR	breathing difficulties
	CL	too large
	СР	cleft palate
	CV	complex vertebral malformation
	D2	born dead – birthing difficulty
	D3	died within 1-4 days
	D4	died after 4 days
	D5	died not due to birthing
	DR	difficult to rear won't drink
	EC	estimated birth date
	ET	extra teats
	HA	hernia
	IN	induced
	MF	mulefoot
	ММ	mummified
	MP	malpresentation/breech
	OD	other deformity – extra/missing limbs etc
	PL	paralysed legs
	PO	polled
	PR	premature
	RC	refer to comment
	RF	red factor
	SB	still born
	SC	scours
	SD	spinal deformity
	SJ	short jaw
	SW	swollen joints
	TD	tail deformity/no tail



Reference Data Type	Code Values	Reference Data Description
	TF	twisted feet
	WS	weak and/or small
CountryOfOriginCode	(* refer ISO) O 3166-1 alpha 3 *)
DateOfBirthConfidenceIndicatorTypeCode	1	actual
	2	estimated by farmer
DryingOffReasonTypeCode	EC	eczema
	EL	end lactation
	IN	injured
	FM	farm management
	МА	mastitis
	ос	other causes
	OD	other diseases
	SI	sick
FateOfCalfTypeCode	В	bobbied
	С	culled
	D	died
	R	reared
	S	sold
FateTypeCode	С	culled
	D	died
	м	moved with no change of owner (lent, shifted)
	R	renumbered within same herd
	S	moved with change of owner (sold, bobbied, leased)
	w	Went to works
HerdIndustryParticipantRelationshipTypeCode	HR	is herd recorded by
	НТ	is herd tested by
	РТ	is progeny tested by
HerdLocationRelationshipTypeCode	F	is farmed at
HerdParticipantRelationshipTypeCode	МС	milk is contracted to
HerdTestValidIndicator	0	is valid
	1	is not valid
LocusTypeCode	В	Bovine Leukocyte Adhesion Deficiency (BLAD)
	С	Citrullinemia
	S	Small Calf Syndrome
	v	Complex Vertebral Malformation (CVM)
MarketingBreedTypeCode	ABC	Aubrac
	AFR	Africander
	AGL	Angler



Reference Data Type	Code Values	Reference Data Description
	AKW	Ankole Watusi
	ANG	Angus
	ANL	Angus-Lowline
	AUL	Australian Lowline
	AUR	Australian Red
	AYR	Ayrshire
	BAZ	Bazadaise
	BEB	Beefblend
	BEF	Beefalo
	BFM	Beefmaster
	BGB	Belgian Blue
	BLO	Blond D'Aquitane
	BMR	Belmont Red
	BON	Boran
	BRF	Braford
	BRH	Brahman
	BRN	Brangus
	BRS	Brown Swiss
	BRV	Braunveih
	BUF	Buffalo
	BWH	British White
	СНА	Charolais
	СНІ	Chianina
	СМР	Composite
	DAR	Danish Red
	DEV	Devon
	DEX	Dexter
	DRG	Dairy Gir
	DRO	Droughtmaster
	DUB	Dutch Belted
	DUR	Durham
	ELH	English Longhorn
	END	Enderby Island
	FRI	Friesian
	GAB	Galloway-Belted
	GAL	Galloway
	GAS	Gasconne
	GAW	Galloway White



Reference Data Type	Code Values	Reference Data Description
	GEL	Gelbvieh
	GIR	Gir
	GRL	Girolando
	GRY	Greyman
	GUC	Guernsey – Canadian
	GUE	Guernsey
	HAY	Hays Converter
	HEM	Miniature Hereford
	HEP	Hereford – Polled
	HEQ	Hereford – Horned
	HER	Hereford
	HEW	Hereford - White
	HIN	Hinterwald
	HUM	Hummel
	JER	Jersey
	KER	Kerry
	LIM	Limousin
	LIN	Lincoln
	LOH	Longhorn
	LUI	Luing
	MAI	Maine-Anjou
	MAN	Mandalong Special
	MAR	Marchigiana
	MBL	Montbeliard
	MGL	Miniature Galloway
	MEU	Meuse-Rhine-Yssel
	MSC	Miniature Scottish Highland
	MSH	Mashona
	MUG	Murray Grey
	NRM	Normande
	NWR	Norwegian Red
	NZG	New Zealand Grey
	PAR	Parthenais
	PID	Piedmontese
	PIN	Pinzgauer
	PIR	Pie Rouge
	PST	PusterTaler
	RAG	Rangemaker



Reference Data Type	Code Values	Reference Data Description
	RAN	Angus – Red
	RED	Devon - Red
	REP	Red Poll
	RFL	Rouge Flamande
	ROM	Romagnola
	ROT	Rotbut
	RSI	Red Sindi
	SAH	Sahiwal
	SAL	Salers
	SAN	Santa Gertrudis
	SAX	Sahiwal X
	SCO	Scottish Highland
	SEN	Senepol
	SFV	Simmental Fleckvieh
	SHB	Shorthorn Beef
	SHF	Shorthorn Beef – Polled
	SHI	Shorthorn Aust Illawara
	SHM	Milking Shorthorn
	SHP	Shorthorn Polled
	SHV	Shaver
	SIM	Simmental
	SIP	Simmental – Polled
	SOD	South Devon
	SPP	Speckle Park
	STA	Stabilizer
	SUS	Sussex
	SWR	Swedish Red
	TAG	Tasmanian Grey
	TAR	Tarantaise
	TUL	Tuli
	WAG	Wagyu
	WEB	Welsh Black
	XBR	Crossbred
	YAK	Yak
	ZBU	Zebu – Milking
	ZEB	Zebu – Beef
MatingChargeTypeCode	A	association use code
	С	contract mating



Reference Data Type	Code Values	Reference Data Description
	E	emergency – PS semen used in SPS herd
	G	genermate – PS
	н	genermate – nominated
	м	marker – PS semen used in SPS herd
	N	Nominated
	Р	Premier Sires
	R	PS Hereford
	S	Sire Proving Scheme
	т	natural mating
	v	sexed semen – female
	х	experimental
OfficialIndicatorTypeCode	0	no mating records recorded
	1	check to mating dates suggest two or more possible sires
	2	check to mating date indicates that none of those reported is likely to give birth date
	3	negative parentage test
	4	abnormal calving prevents check on mating dates
	5	checked - not 100% official, maybe 2 or more sires or late recording
	6	details checked and parent cannot be confirmed
	7	DNA results indicate that parent is probable
	8	evidence from field or blood typing indicates that parent is possible
	9	check to mating data indicates that parent is possible
ParticipantIndustryParticipantRelatioshipTypeCo de	PBSM	is a Participating Breed Society member of
SampleRegimeTypeCode	1	TAD (am & pm)
	2	single Sample-AM (with >=2 milkings but only AM test)
	3	single Sample-PM (with >=2 milkings but only PM test)
	4	OAD (only 1 milking & test, am or pm)
SexTypeCode	F	female
	м	male
SpatialContextTypeCode	FG	farm gate entrance
TOPTraitTypeCode	AM	adaptability to milking
	ST	shed temperament
	MS	milking speed
	00	overall opinion
	w	weight
	S	stature
	С	capacity



Reference Data Type	Code Values	Reference Data Description
	RA	rump angle
	RW	rump width
	L	rear legs set
	US	udder support
	FU	fore udder
	RU	rear udder
	FT	front teat
	RT	rear teat
	UO	udder overall
	DC	dairy conformation
	вс	body condition
	TL	teat length
VectorSpaceTypeCode	TSP	topology surface point
VectorSpaceMeasurementTypeCode	NZMS1	New Zealand Map Series 1
	WGS84	World Geodetic System 1984

14 Business Rule Descriptions

14.1 Overview

All DIGAD business rules are provided as "synchronous" execution stages, defined as:

synchronous: the business rule is executed during the network application session where the CDP physically transmits the message to DIGAD, for example during an HTTP session.

The sections below list out the business rules in the approximate order of their execution, based on the assumption a CDP is sending messages via web services over HTTP. Messages sent to DIGAD via other methods will be verified against the same business rules, but the execution staging may be different.

14.2 Case Sensitivity

Interbull and NZ herd testing regulations/standards are not case sensitive. In the interests of simplified data logistics and conformity of data, the following business rules have been implemented in DIGAD:

 Synchronous business rules are case sensitive. All reference data codes and CDP/Originator identities must be presented in the correct case as enumerated and published by NZAEL. For the sake of conformity and "reservation" of the lower case space if required by the industry at a later stage, all alphabetic reference codes and Industry Participant identities have been enumerated as upper case.

14.3 Response SOAP Header

Where the CDP Is sending messages to the web services over HTTP, the SOAP header in the DIGAD synchronous response (for both successful and failed messages) will include the CDP's message identifier, the certified data provider, the event instructions, the event type, the event version, the event change time and originator code if they were included in the header of the request per the following example:

```
<s:Envelope xmlns:s="http://www.w3.org/2003/05/soap-envelope">
    <s:Header>
        <CDPMessageIdentifier
xmlns="http://DairyNZ.co.nz/DIGAD/External/201304">12312</CDPMessageIdentifier>
        <OriginatorIdentifier
xmlns="http://DairyNZ.co.nz/DIGAD/External/201304">CRV</OriginatorIdentifier>
        <EventInstruction
xmlns="http://DairyNZ.co.nz/DIGAD/External/201304">write</EventInstruction>
        <EventInstruction
xmlns="http://DairyNZ.co.nz/DIGAD/External/201304">write</EventInstruction>
        <EventChangeTime xmlns="http://DairyNZ.co.nz/DIGAD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">Write</EventInstruction>
        <EventInstruction>
        <EventChangeTime xmlns="http://DairyNZ.co.nz/DIGAD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/External/201304">ISO106AD/Ex
```

The exception to the above is if a response is generated due to:

- authentication failure, or
- SOAP WS-A Address Filter mismatch

In these cases it is not possible to copy the CDP's header information, thus it cannot be returned in the response.

14.4 Synchronously Executed Business Rules

14.4.1 Authentication

The CDP must provide credentials that are successfully understood by the DIGAD credential store. Authentication failure will be indicated by HTTP response code "401" (Unauthorized).



No other information will be provided in the response body.

14.4.2 AUTH – Authorization

The credentials used by the CDP must be authorized to access the requested web service. A failure of this type will be indicated by HTTP response code "403" (Internal Server Error).

Only NZAEL is permitted to send the following events.

Event
AnimalOfficialABCodeEvent
AnimalIndustryParticipantStartEvent
AnimalIndustryParticipantEndEvent

14.4.3 UNRECOGNIZED – Message Format Verification

The format of the message must be recognized by the web service in order to attempt to process it. If the message format is totally unrecognizable, a failure will be indicated by HTTP response code "500" (Internal Server Error).

The message in the body of the HTTP response will be as follows:

```
<s:Fault>
  <s:Code>
    <s:Value>s:Sender</s:Value>
  </s:Code>
  <s:Reason>
    <s:Text xml:lang="en-NZ">UNRECOGNIZED</s:Text>
  </s:Reason>
  <s:Detail>
    <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <FaultCode>UNRECOGNIZED</FaultCode>
      <Reason>Unrecognized XML message type</Reason>
      <Message>Finding the document specification by message type
"http://DairyNZ.co.nz/DIGAD/External/201304#RegisterHerdTestEvent" failed.</Message>
    </DIGADException>
  </s:Detail>
</s:Fault>
```

14.4.4 SOAP Envelope Verification

14.4.4.1 SOAP WS-A Address Filter Mismatch

The SOAP WS-A "To" address specified must match that of the endpoint URL at which the address is hosted. A mismatch will result in an error indicated by HTTP response code "500" (Internal Server Error).

The message in the body of the HTTP response will be as follows:

```
<s:Fault xmlns:s=http://www.w3.org/2003/05/soap-envelope
xmlns:a="http://www.w3.org/2005/08/addressing">
    <s:Code>
        <s:Code>
        <s:Value>s:Sender</s:Value>
        <s:Subcode>
        <s:Value>a:DestinationUnreachable</s:Value>
        </s:Subcode>
        </s:Subcode>
        <s:Subcode>
        <s:Subco
```



```
<s:Text xml:lang="en-NZ">The message with To 'https://
server.digad.co.nz/AnimalEvent201304/DIGADAnimalEventService.svc' cannot be processed
at the receiver, due to an AddressFilter mismatch at the EndpointDispatcher. Check
that the sender and receiver's EndpointAddresses agree.</s:Text>
    </s:Reason>
</s:Fault>
```

14.4.4.2 SOAP WS-A Mandatory Headers Verification

The SOAP WS-A "To" and "Action" headers must be included in the message header in order for DIGAD to be able to process the message. Missing headers will result in a failure which will be indicated by HTTP response code "500" (Internal Server Error).

The message in the body of the HTTP response will be as follows:

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope" >
  <s:Code>
    <s:Value>s:Sender</s:Value>
  </s:Code>
  <s:Reason>
    <s:Text xml:lang="en-NZ">SOAP1</s:Text>
  </s:Reason>
  <s:Detail>
    <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <FaultCode>SOAP1</FaultCode>
      <Reason>WS-Addressing headers missing</Reason>
      <Message>Please ensure that WS-Addressing Action and To headers must be
provided in the request message.</Message>
    </DIGADException>
  </s:Detail>
</s:Fault>
```

14.4.4.3 SOAP WS-A Action Format Verification

The SOAP WS-A Action header value must match a valid operation as specified in the WSDL corresponding to the service being called. If this is not the case then this will result in a failed response which will be indicated by HTTP response code "500" (Internal Server Error).

The message in the body of the HTTP response will be as follows:

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope" >
  <s:Code>
    <s:Value>s:Sender</s:Value>
  </s:Code>
  <s:Reason>
    <s:Text xml:lang="en-NZ">SOAP2</s:Text>
  </s:Reason>
  <s:Detail>
    <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <FaultCode>SOAP2</FaultCode>
      <Reason>SOAP Action format was incorrect</Reason>
      <Message>SOAP Action RegisterHerdTestEventa was not in the expected
format.</Message>
    </DIGADException>
  </s:Detail>
</s:Fault>
```



14.4.4.4 SOAP WS-A To and Action Matching

The SOAP WS-A To and Action headers included in the message header must be related to each other in order for DIGAD to be able to process the message. This is to say that the To address must be compatible with the Action in question to ensure that only methods corresponding to the called service are available. Mismatches will result in a failure which will be indicated by HTTP response code "500" (Internal Server Error).

The message in the body of the HTTP response will be as follows:

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope" >
  <s:Code>
    <s:Value>s:Sender</s:Value>
  </s:Code>
  <s:Reason>
    <s:Text xml:lang="en-NZ">SOAP3</s:Text>
  </s:Reason>
  <s:Detail>
    <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <FaultCode>SOAP3</FaultCode>
      <Reason>SOAP Action and To Address did not match up</Reason>
      <Message>SOAP Action RegisterAnimalEvent was not expected for To address
https://server.digad.co.nz/HerdTestEvent201304/DIGADHerdTestEventService.svc.</Messag
e>
    </DIGADException>
  </s:Detail>
</s:Fault>
```

14.4.4.5 SOAP WS-A Action and Message Type Matching

The SOAP WS-A Action header included in the message header must be matched with the XML message type included in the message body in order for DIGAD to be able to process the message. This is to say that messages submitted for a specific operation must match the contract defined in the WSDL. Mismatches will result in a failure which will be indicated by HTTP response code "500" (Internal Server Error).

The message in the body of the HTTP response will be as follows:

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope" >
  <s:Code>
    <s:Value>s:Sender</s:Value>
  </s:Code>
  <s:Reason>
    <s:Text xml:lang="en-NZ">SOAP4</s:Text>
  </s:Reason>
  <s:Detail>
    <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <FaultCode>SOAP4</FaultCode>
      <Reason>SOAP Action and XML Message type did not match up</Reason>
      <Message>Message type
http://DairyNZ.co.nz/DIGAD/External/201304#RegisterAnimalEvent was not expected for
SOAP Action RegisterHerdTestEvent.</Message>
    </DIGADException>
  </s:Detail>
</s:Fault>
```



14.4.5 Business Rule Engine (BRE)

14.4.5.1 BRE1 – Message CDP Credentials Verification

The CertifiedDataProviderIdentifier value must map to the CDP account GUID specified in the SOAP envelope. BRE1 will run against all messages.

The test result will be "true" or "false". A "false" result will cause the message to be rejected which will be indicated by HTTP response code "500" (Internal Server Error). The message in the body of the HTTP response will be as follows:

"[username] is not allowed to submit messages to DIGAD on behalf of the [CDP] certified data provider."

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
     <s:Code>
             <s:Value>s:Sender</s:Value>
     </s:Code>
     <s:Reason>
            <s:Text xml:lang="en-NZ">BRE1</s:Text>
     </s:Reason>
     <s:Detail>
             <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
            xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
                    <FaultCode>BRE1</FaultCode>
                    <Reason>Username/CDP Mismatch Failure</Reason>
                    <Message>JC-BT2013VM\licuser is not allowed to submit messages to
                   DIGAD on behalf of the NZAEL certified data provider. </Message>
             </DIGADException>
    </s:Detail>
</s:Fault>
```

14.4.5.2 BRE2 – Message CDP Originator Verification

The CertifiedDataProviderIdentifier must match the OriginatorIdentifier. BRE2 will run against all messages.

The test result will be "true" or "false". A "false" result will cause the message to be rejected which will be indicated by HTTP response code "500" (Internal Server Error). The message in the body of the HTTP response will be as follows:

"[CDP] certified data provider is not allowed to submit messages to DIGAD on behalf of the [DataOriginator] data originator."

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
     <s:Code>
            <s:Value>s:Sender</s:Value>
     </s:Code>
     <s:Reason>
            <s:Text xml:lang="en-NZ">BRE2</s:Text>
     </s:Reason>
     <s:Detail>
           <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
           xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
                    <FaultCode>BRE2</FaultCode>
                   <Reason>CDP/Data Originator Mismatch Failure</Reason>
                   <Message>LIC certified data provider is not allowed to submit
                   messages to DIGAD on behalf of the NZAEL data originator.
                   </Message>
            </DIGADException>
     </s:Detail>
```



</s:Fault>

14.4.5.3 BRE3 – Message EventChangeTime Verification

The EventChangeTime must be equal to or earlier than the commit time of the message to the DIGAD receive point. BRE3 will run against all messages.

The test result will be "true" or "false". A "false" result will cause the message to be rejected which will be indicated by HTTP response code "500" (Internal Server Error). The message in the body of the HTTP response will be as follows:

"The EventChangeDataTime must not be later than the time when the message was received by DIGAD."

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
     <s:Code>
             <s:Value>s:Sender</s:Value>
     </s:Code>
     <s:Reason>
            <s:Text xml:lang="en-NZ">BRE3</s:Text>
     </s:Reason>
     <s:Detail>
           <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
           xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
                    <FaultCode>BRE3</FaultCode>
                    <Reason>EventChangeTime is in the future</Reason>
                    <Message>The EventChangeDataTime must not be later than the time
                   when the message was received by DIGAD. </Message>
           </DIGADException>
     </s:Detail>
</s:Fault>
```

14.4.5.4 BRE4 – Object Identification EventInstruction Validation

Deprecated as of v1.4.3

14.4.5.5 BRE5 – EventInstruction and WriteElement Validation

For all events containing the element "WriteElements":

- where the EventInstruction is "write", WriteElements must be presented
- where EventInstruction is "retract", the WriteElements element must not be presented

The list of events containing the element "WriteElements" is as follows:

- AnimalEvent
- LocationEvent
- ParticipantEvent
- IndustryParticipantEvent
- ReferenceDataEvent
- AnimalAncestryEvent
- AnimalHerdStartEvent
- AnimalHerdEndEvent
- AnimalHerdManagementNumberStartEvent
- AnimalHerdManagementNumberEndEvent
- HerdLocationStartEvent
- HerdLocationEndEvent
- ArtificialInseminationEvent



- BodyConditionInspectionEvent
- DryingOffEvent
- EmbryoTransferEvent
- HerdTestEvent
- LiveweightInspectionEvent
- NaturalMatingEvent
- ParturitionEvent
- RunWithBullStartEvent
- RunWithBullEndEvent
- TraitsOtherThanProductionInspectionEvent

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
```

```
<s:Code>
            <s:Value>s:Sender</s:Value>
     </s:Code>
     <s:Reason>
            <s:Text xml:lang="en-NZ">BRE4</s:Text>
     </s:Reason>
     <s:Detail>
           <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
           xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
                    <FaultCode>BRE5</FaultCode>
                    <Reason>WriteElement validation error</Reason>
                    <Message>The WriteElement must be <present/absent> for an event
                   of type <Event Type> with an EventInstruction of
                    <write/retract>.</Message>
           </DIGADException>
     </s:Detail>
</s:Fault>
```

14.4.5.6 BRE6 – Message Header Verification

The mandatory elements in the MessageHeader element must be supplied.

The test result will be "true" or "false". A "false" result will cause the message to be rejected which will be indicated by HTTP response code "500" (Internal Server Error). The message in the body of the HTTP response will be as follows:

"Please ensure that the submitted message has a value provided within the MessageHeader element for [missing element]."

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  <s:Code>
    <s:Value>s:Sender</s:Value>
  </s:Code>
  <s:Reason>
    <s:Text xml:lang="en-NZ">BRE6</s:Text>
  </s:Reason>
  <s:Detail>
    <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <FaultCode>BRE6</FaultCode>
      <Reason>Mandatory MessageHeader elements missing</Reason>
      <Message>Please ensure that the submitted message has a value provided within
the MessageHeader element for CertifiedDataProviderIdentifier.</Message>
    </DIGADException>
  </s:Detail>
</s:Fault>
```

14.4.5.7 BRE7 – Animal Durable Key Not Found

The Animal Durable Key provided is unknown to DIGAD. This is accomplished by sending the animal identification to the animal register API and retrieving a valid Animal Durable Key

Event	Animal Identifier
AnimalEvent	Animalldentification
AnimalAncestryEvent	ProgenyIdentification
	AncestorIdentification
ArtificialInseminationEvent	Cowldentification
	ArtificialInseminationBullIdentification
BodyConditionInspectionEvent	Cowldentification
DryingOffEvent	Cowldentification
EmbryoTransferEvent	EmbryoDonorldentification
	EmbryoSireIdentification
	EmbryoRecipientIdentification
HerdTestEvent	Cowldentification
LiveweightInspectionEvent	Cowldentification
NaturalMatingEvent	Cowldentification
	BullIdentification
ParturitionEvent	Damldentification
RunWithBullStartEvent	Cowldentification
	BullIdentification
RunWithBullEndEvent	Cowldentification
	BullIdentification
TraitsOtherThanProductionInspectionEvent	Cowldentification
AnimalHerdStartEvent	RelatedAnimalIdentification

The list of events and elements checked by this BRE are as follows:



AnimalHerdEndEvent	RelatedAnimalIdentification
AnimalHerdManagementNumberStartEvent	RelatedAnimalIdentification
AnimalHerdManagementNumberEndEvent	RelatedAnimalIdentification
AnimalIndustryParticipantStartEvent	RelatedAnimalIdentification
AnimalIndustryParticipantEndEvent	RelatedAnimalIdentification

The test result will be "true" or "false". A "false" result will cause the message to be rejected which will be indicated by HTTP response code "500" (Internal Server Error). The message in the body of the HTTP response will be as follows:

"Please ensure that the submitted message has a valid AnimalDurableKey for [missing element]."

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  <s:Code>
    <s:Value>s:Sender</s:Value>
  </s:Code>
  <s:Reason>
    <s:Text xml:lang="en-NZ">BRE7</s:Text>
  </s:Reason>
  <s:Detail>
    <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <FaultCode>BRE7</FaultCode>
      <Reason>AnimalDurableKev not found</Reason>
      <Message>Please ensure that the submitted message has a value AnimalDurableKey
for CowIdentification.</Message>
    </DIGADException>
  </s:Detail>
</s:Fault>
```

BRE7 can also return for unknown Herds:

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
 <s:Code>
    <s:Value>s:Sender</s:Value>
  </s:Code>
  <s:Reason>
    <s:Text xml:lang="en-NZ">BRE7</s:Text>
  </s:Reason>
  <s:Detail>
    <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <FaultCode>BRE7</FaultCode>
      <Reason>HerdLocationIdentifier not found</Reason>
      <Message>{MapReference}/{HerdNumber} does not refer to a Herd in DIGAD. Either
send through Herd event, or, if you have already sent the appropriate event through,
please retry this event submission in the next hour</Message>
    </DIGADException>
  </s:Detail>
</s:Fault>
```

14.4.5.8 BRE8 – Conflicting Date Ranges

This solution specifically requires no overlapping relationships between Animal \rightarrow Herd (including Management Number), Herd \rightarrow Industry Participant. However, as all farming object relationship types describe a time period linking two entities, all types supported by DIGAD will be protected by this BRE.



If there is an open or conflicting relationship for the same object and type from another CDP, then the event will be rejected by a new synchronous BRE error. If the new event is from the same CDP, then the BRE will not reject the event.

When	And database relationship records contain	And Compare CDP from event	Then BRE
Receiving		with the CDP for the existing	
Event of		database relationship (from	
Туре		the previous column)	
Start	No existing relationships	-	Pass
End	No existing relationships	-	Pass
Start	No existing start and end range for that date	-	Pass
End	No existing start and end range for that date	-	Pass
Start	Existing start in the past with no corresponding end	Same	Pass
End	Existing start in the past with no corresponding end	Same	Pass
Start	Existing start in the future	Same	Pass
End	Existing start in the future	Same	Pass
Start	Existing end in the future with no corresponding start	Same	Pass
End	Existing end in the future with no corresponding start	Same	Pass
Start	Existing start and end range for that date	Same	Pass
End	Existing start and end range for that date	Same	Pass
Start	Existing start in the past with no corresponding end	Different	Fail
End	Existing start in the past with no corresponding end	Different	Fail
Start	Existing start in the future	Different	Fail
End	Existing start in the future	Different	Pass
Start	Existing end in the future with no corresponding start	Different	Fail
End	Existing end in the future with no corresponding start	Different	Fail
Start	Existing start and end range for that date	Different	Fail
End	Existing start and end range for that date	Different	Fail

The business rules in the table above can be simplified to the following conditions:

Compare CDP from event with the CDP	When Receiving Event of	And database relationship	Then BRE
for the existing database relationship ²	Туре	records contain	
N/A (no existing relationships or valid ranges for that date to get a CDP)	Start or End	N/A	Pass
Same	Start or End	*	Pass
Different	End	Existing start in the future	Pass
Different	Start or End	*	Fail

Relationship Events affected:

Event
AnimalHerdStartEvent
AnimalHerdEndEvent
AnimalHerdManagementNumberStartEvent
AnimalHerdManagementNumberEndEvent
AnimalIndustryParticipantStartEvent
AnimalIndustryParticipantEndEvent
HerdIndustryParticipantStartEvent
HerdIndustryParticipantEndEvent

² An existing relationship for two entities is defined as: when given a date, is there a start and (optional) end range that spans that date in the database?



HerdLocationStartEvent
HerdLocationEndEvent
HerdParticipantStartEvent
HerdParticipantEndEvent
ParticipantIndustryParticipantStartEvent
ParticipantIndustryParticipantEndEvent

"Please ensure that the submitted date range is not conflicting with an existing date range."

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  <s:Code>
    <s:Value>s:Sender</s:Value>
  </s:Code>
  <s:Reason>
    <s:Text xml:lang="en-NZ">BRE8</s:Text>
  </s:Reason>
  <s:Detail>
    <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <FaultCode>BRE8</FaultCode>
      <Reason>Conflicting Date Range found</Reason>
      <Message>Please ensure that the submitted date range is not conflicting with an
existing date range.</Message>
   </DIGADException>
  </s:Detail>
</s:Fault>
```

14.4.5.9 BRE9 – Animal Authorisation

For the following incoming events, the specified animal field will be compared to ensure the CDP submitting the event is the same as the "DIGAD Herd Recorder" for that animal. If the CDP is different, then the BRE will fail.

Event	Animal Field to Compare CDP
AnimalEvent (excluding NewAnimalEvent)	Animal
AnimalAncestryEvent	Progeny
ArtificialInseminationEvent	Cow
BodyConditionInspectionEvent	Cow
DryingOffEvent	Cow
EmbryoTransferEvent	EmbryoDonor
LiveweightInspectionEvent	Cow
NaturalMatingEvent	Cow
ParturitionEvent	Cow
RunWithBullStartEvent	Cow
RunWithBullEndEvent	Cow
TraitsOtherThanProductionInspectionEvent	Cow
AnimalHerdManagementNumberStartEvent	RelatedAnimal
AnimalHerdManagementNumberEndEvent	RelatedAnimal

"Permission for updating the Animal for the submitted message was denied."

<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
 <s:Code>
 <s:Value>s:Sender</s:Value>
```
</s:Code>
<s:Reason>
<s:Text xml:lang="en-NZ">BRE9</s:Text>
</s:Reason>
<s:Detail>
<DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
<FaultCode>BRE9</FaultCode>
<FaultCode>BRE9</FaultCode>
<Reason>Permission Denied </Reason>
<Message>Permission for updating the Animal for the submitted message was
denied.</Message>
</DIGADException>
</s:Detail>
</s:Fault>
```

14.4.5.10 BRE10 – Herd Authorisation

The following events require comparing the submitting CDP with the "DIGAD Herd Recorder" for that herd. If the CDP is different, then the BRE will fail.

Event	Restriction
HerdTestEvent	Only the Herd Recorder for the Herd can create a Herd Test

"Permission for updating the Herd for the submitted message was denied."

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  <s:Code>
    <s:Value>s:Sender</s:Value>
  </s:Code>
  <s:Reason>
    <s:Text xml:lang="en-NZ">BRE10</s:Text>
  </s:Reason>
  <s:Detail>
    <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <FaultCode>BRE10</FaultCode>
      <Reason>Permission Denied </Reason>
      <Message>Permission for updating the herd for the submitted message was
denied.</Message>
    </DIGADException>
  </s:Detail>
</s:Fault>
```

14.4.5.11 BRE11 – Locked Herd Test

Only the original CDP associated with the herd can maintain an existing DIGAD Herd Test and the Herd Test Results for the animals present at the time of the herd test. If the herd changes CDP, then any previous Herd Tests are locked³ and restrict any modification.

Event Restriction

³ The reason for locking a herd test from modification is because the herd test is a property of both the herd and all the animals in that herd at the time of the herd test. If the herd changes CDP, the new CDP may not have any indication of the animals that were in the herd at the time of the test. Due to limitations in the herd test event, if the new CDP edits the herd test, then that will remove the results for any animals previously in the herd. Additionally, the herd testing CDP cannot edit the herd test as they are no longer the CDP for the herd.



HerdTestEvent	When updating/retracting:	
	1.	Compare CDP of the incoming event with the Herd Test's original CDP. Fail if different.
	2.	Compare CDP of the incoming event with the Herd's CDP. Fail if different.

"The herd test is locked and cannot be updated."

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  <s:Code>
    <s:Value>s:Sender</s:Value>
  </s:Code>
  <s:Reason>
    <s:Text xml:lang="en-NZ">BRE11</s:Text>
  </s:Reason>
  <s:Detail>
    <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
      <FaultCode>BRE11</FaultCode>
      <Reason>Herd Test Locked </Reason>
      <Message>The herd test is locked and cannot be updated.</Message>
    </DIGADException>
  </s:Detail>
</s:Fault>
```

14.4.6 XMLVAL - Schema Validation

DIGAD will perform an XML document schema validation using the farm event XSD. Schema validation includes:

- XML elements
- data types
- reference data
- mandatory/optional fields
- cardinality of nested elements
- uniqueness of nested elements
- element choices

Schema validation failures will be indicated by HTTP response code "500" (Internal Server Error). An example of a failed schema validation is below. In this example the supplied participant code is of the wrong datatype.

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
```



If the event fails a uniqueness constraint rule, the error message will reference the name of the violated constraint rule.

14.4.7 SYS - Internal Failure

In the event of any unexpected internal failure at any point in synchronous rule execution, the HTTP response code "500" (Internal Server Error) will be returned.

A generic response will be sent as follows:

```
<s:Fault xmlns:s="http://www.w3.org/2003/05/soap-envelope">
     <s:Code>
             <s:Value>s:Receiver</s:Value>
     </s:Code>
     <s:Reason>
             <s:Text xml:lang="en-NZ">SYS</s:Text>
     </s:Reason>
     <s:Detail>
           <DIGADException xmlns="http://DairyNZ.co.nz/DIGAD/External/201304"</pre>
           xmlns:i="http://www.w3.org/2001/XMLSchema-instance">
              <FaultCode>SYS</FaultCode>
              <Reason>Internal System Failure</Reason>
              <Message>Please contact DairyNZ support staff and advise them that an
              internal system failure message has been received. Once they have
              resolved the issue you should resubmit this message.</Message>
           </DIGADException>
     </s:Detail>
</s:Fault>
```



15 Technical Overview

15.1 Summary

CDPs will access the DIGAD HRP interface via the internet, without site-to-site links or VPNs. CDPs must connect to DIGAD from a fixed IP address range known to NZAEL.

The inbound interface comprises SOAP web services. Web services expose endpoints over HTTP secured by certificate-based transport layer security (SSL). The services accept inbound "messages" which comprise a SOAP envelope and XML document. Each farm event type will be supported by a single web service and message description.

A basic authentication scheme is applied utilising identification and credentials provisioned to the CDPs by NZAEL. CDPs must use separate identities and credentials for each DIGAD environment. All web service requests will be authorized to ensure the identity associated with the attached credentials is allowed to call that service.

Following successful "synchronous" message verification during the HTTP session and subsequent delivery of the message, the message meta-data and XML document is stored within DIGAD for subsequent processing into the DIGAD database.

15.1.1 Interface Pattern

The interface is designed according to a "document exchange" style, where an XML document contains a complete description of a farm event. CDPs must transform validated farm event data into an XML document in accordance with the published schema and deliver the document to DIGAD via the appropriate SOAP web service.

XML documents are conceived as "atomic" packets of data, which are processed (or not) in their entirety. A farm event description must always represent the most recent and complete description of the entire event. Any data not present in an event description will be interpreted by DIGAD as "not existing" in the latest description of that event.

Farm event descriptions contained within successfully processed XML documents are registered in the DIGAD database. CDPs may register new and changed farm event descriptions by delivering multiple XML documents over time. CDPs may also "retract" previously sent documents to affect a "logical delete". DIGAD never physically deletes data, instead maintaining a complete history of all messages, XML documents and resultant database records.

15.1.2 Inbound Message Sequencing

The preference is for CDPs to deliver documents in the order in which the described farm events occurred. DIGAD does however accommodate disruption to the physical sequencing through use of several date/time data. The date/time data allows DIGAD to process events in a sequence that is independent to the "real-world" sequence".

An exception to the above is the processing of events that change farming object identifiers. Farming object identifier events that do not process in sequence will potentially result in an error.

15.1.3 CDP Outbound Message Queuing

CDPs are required to queue undelivered documents indefinitely, as specified in the relevant CDP/NZAEL data supply agreement. CDPs must retain successfully delivered documents for a minimum time period and have the ability to re-send previously delivered documents when requested to support agreed business continuity plans.

Document queuing and retention periods are specified in the CDP/NZAEL data supply agreement.



15.1.4 Inbound Message Frequency

The DIGAD system can functionally accommodate a wide range of message frequency distributions, albeit there is a maximum throughput rate. CDPs must send messages within a frequency range agreed by the CDP and NZAEL however, to ensure that Animal Evaluation and Industry Good service levels are maintained.

Message frequency is specified in the CDP/NZAEL data supply agreement.

15.1.5 Message Tracking

DIGAD will record the CDP's identifier as supplied in the message header which will allow tracking of the message in the database.

DIGAD will return the entire message header, including CDP message identifier, in every HTTP response along with the HTTP response code whether successful or unsuccessful. NZAEL and CDP can therefore maintain their respective logs to provide for tracking across both organisation's systems.

15.1.6 DIGAD Rollback

The DIGAD document store and database can be rolled back if necessary, but rollback would be a manual NZAEL operational process executed only in exceptional circumstances. Conceptually, the previously received, problematic documents would be deleted from the document store, the DIGAD database rolled back to the desired point in time, and the remaining documents reprocessed back into the database.

Reprocessing of documents could require a lot of computer resource and time. The physical strategy to achieve rollback would therefore vary depending on the circumstances.

15.1.7 Time Services

The solution is not particularly sensitive to clock consistency between CDPs and NZAEL: sub-second inconsistencies are unlikely to cause issues.

CDPs are expected to use one or more external time services to synchronise server clocks. DIGAD uses pool.NTP.org and time.windows.com.

Message time formats are specified to include UTC offset to avoid daylight saving time change issues.



15.2 Message Process Flow

This section describes the DIGAD message process flow. The purpose is to provide CDPs with the configuration details needed to consume the DIGAD HRP interface.

15.2.1 Overview

The below diagram provides an overview of the DIGAD message process flow. The process details are described in subsequent paragraphs.



15.2.2 Message Sent to Web Service

15.2.2.1 CDP Network Interface

CDPs will request web services via the internet from a known IP address range. CDP IP address ranges must be supplied to NZAEL prior to service commencement.

DIGAD will not respond to communications received from unknown IP address ranges.

15.2.2.2 DIGAD Network Interface

DIGAD implements an external interface comprising the following external IP addresses and ports:

System	Function	Protocol	IP Address	Port
receive.digad.co.nz	HTTPS based API	HTTPS	will be provided	TCP 443

DIGAD will not respond to communications received on other ports.

15.2.2.3 Transport Layer Encryption

Certificate-based encryption will be implemented at the server level for all inbound DIGAD connections to ensure that the server accepting the connection is verified to the connecting client. DIGAD has certificates for each end point per the above table.



All HTTP communications, including the client authentication credentials and farm event data, will be encrypted in transit between endpoints. DIGAD will not communicate with CDP systems on a non-encrypted transport layer.

Certificate issuing authority details will be provided to CDPs.

15.2.3 Synchronous Message Verification

The processes in this section are collectively considered as "synchronous" verification. This means the processes are executed during the HTTP session.

15.2.3.1 Inbound Web Services

The web service's description is "DIGAD{Event Name}Service201304", where "201304" is the version number and {Event Name} is the name of the event. The web service name is "DIGAD{Event Name}Service" and the target namespace of the service is <u>http://DairyNZ.co.nz/DIGAD/External/201304</u>.

The events and interface schema names are specified in the sections above in this document.

If a request is received for a web service that does not exist, DIGAD will issue an HTTP 404 Not Found response. A CDP must treat the message as "not delivered".

15.2.3.2 Authentication/Authorisation

An inbound CDP message comprises a SOAP "envelope" containing an XML "document". DIGAD will authenticate the identity wishing to consume the DIGAD web service, using the identity and credentials supplied by the CDP within the SOAP envelope. If the CDP is authenticated, DIGAD will determine if the CDP is authorised to consume the requested service.

Authentication or authorisation failure will result in an HTTP 403 Forbidden response. A CDP must treat the message as "not delivered".

DIGAD test environments will require a separate set of credentials.

15.2.3.3 Schema Validation

DIGAD will perform an XML document schema validation at the initial receive point using the farm event XSD. Schema validation includes:

- XML elements
- data types
- reference data
- mandatory/optional fields
- cardinality of nested elements
- uniqueness of nested elements

The technical validation process will end at the first schema validation exception (if any) and will result in an HTTP 500 response. The CDP must treat the message as "not delivered". The response will include a SOAP envelope containing a message describing the exception.

15.2.3.4 Business Rule Engine (BRE) Verification

If schema validation is successful, a small number of critical business rules will be applied to the document. The business rule verification will end at the first exception (if any) and will result in an HTTP 500 response. The CDP must treat the message as "not delivered".



15.2.3.5 Internal System Failure

If any DIGAD fails to process the other than those described above, an "internal system failure" response will be raised. The CDP should resubmit the message once the DIGAD fault has been rectified.

15.2.4 Event Messages committed to DIGAD Message Box

If all "synchronous" verification steps are successful, the message is committed to the DIGAD message box. Once the message is successfully committed a HTTP 200 OK response is issued and the session closed. The CDP must treat the message as "delivered", remove the message from their outbound queue, and retain the message for the agreed minimum retention period required for DIGAD BCP.

15.2.5 Versioning and Change Control

Versioning strategies must be able to cater for both non-breaking changes as well as breaking changes.

Non-breaking change are those that would not result in the invalidation of any existing messages as a result of the change. Typical non-breaking changes are the addition of optional elements to a schema, removing or relaxing a restriction on an element, changing a mandatory element to be optional etc.

A breaking change is considered to be one that would invalidate existing messages. Examples of breaking changes are the introduction of a new mandatory element, changing an optional element to be mandatory, removal of an element, the introduction of a restriction on an element etc.

15.2.6 Versioning Schemas

Every schema will contain a target namespace with a version number at the end such as http://DairyNZ.co.nz/DIGAD/External/201304, and that version number will also be contained in the schema file's name such as BCS_201304_XML.xsd. All externally exposed schemas will also contain an attribute at the root level called MinorVersion which will have a fixed value set (starting at 1).

When a non-breaking change is required to be made to a schema then the existing schema file will be updated with no changes to the file name or the target namespace, however the MinorVersion attribute's fixed value will be incremented by one.

When a breaking change is required NZAEL will ensure that upstream and downstream systems do not break in the interim before they are updated to take advantage of the new schemas.

15.2.7 Versioning Web Services

Each WSDL will also contain a target namespace which is of the same format as the schema target namespaces, and each WSDL's URL will also contain a version number. When a non-breaking change is made to a schema then a new copy of the WSDL will be generated using the new copies of the schema with no changes to the target namespace or the URL and the old WSDL will be overwritten.

When a breaking change is made to a schema NZAEL will ensure that existing client applications do not break in the interim before they are updated to take advantage of the new schemas. A new WSDL will be generated, this time with the version number in the target namespace of the WSDL as well as in the URL being incremented to a new version number and with the request/response schemas for the relevant operations being repointed to the new schema files.

The versioning strategy will allow for client applications which generated their proxy code via the old WSDL to continue using the old schema format as it is still deployed and in use in the API, and will also allow for client applications which have generated their proxy code via the new WSDL to submit messages to the API.



15.3 Extending the HRP Interface

15.3.1 Provisioning of reference data

A business decision has been made to include reference data in the form of enumeration constraints in externally exposed schemas. This serves a dual purpose in that it conveys allowed data values for schema elements in published WSDLs, and it also allows for XML validation to detect non valid values in messages at the receive location and prevent such invalid messages from being accepted into the DIGAD message box.

This reference data tends to be static in nature, but it is predicted that there may be one or two changes a year. Catering for such changes will require that the schema appropriate and WSDL are adjusted (following appropriate versioning rules depending on whether the change is breaking or non-breaking) and redeployed. NZAEL will gather requirements and engage with the appropriate party to initiate the change process. In terms of reference data, the introduction of new reference data is considered a non-breaking change while the retiring of existing reference data would be considered a breaking change.

It is possible that even in the case of breaking reference data changes that existing schemas and endpoints are overwritten rather than supplemented by new versions of schemas and endpoints in order to ensure that retired reference data is no longer allowed from that point onwards, though this deviation from regular versioning procedures would have to be driven by business requirements.

15.3.2 Catering for new event types

If a new event type is identified, then new schemas will be created for that event type. New web services will be deployed for each of the new events.

15.3.3 Catering for reporting and enrichment

DIGAD caters for the fact that for each event type / certified data provider / status combination that there might be different reporting requirements and that the recipient(s) may wish to receive additional data such as durable key values created by the DIGAD data warehouse.



Appendix 1 – Change Log

version	Ref.	Item	Change Description
1.5.8	8.2.3	ArtificialInseminationBullIdentification	Update cardinality to "0 to many" to match the WSDL
1.5.8	9.4.1	Herd Dates	Previous Animal Herd details now provide Start and End dates as distinct fields
1.5.8	9.4.2	Herd Dates	Combine Previous Animal Herd Details and Previous Animal Herd Management Number Details
1.5.8	13	TOPTraitTypeCode	Added Teat Length; Front Udder => Fore Udder; Legs => Rear Legs Set
1.5.8	8.12	TraitsOtherThanProductionInspectionEvent	Added 202016 version
1.5.7	5.2	QueryAnimal	Renamed from QueryAnimalByIdentifier. Added SexTypeCode
1.5.6	14.4.5.7	BRE7	Add herd not found
1.5.6	5.2	QueryAnimalByIdentifier	Added new event
1.5.6	Gen	AnimalDurableKey	Explicit documentation of AnimalDurableKey as a long (64-bit integer)
1.5.5	13	CauseOfFateTypeCode	Added 'MB'
1.5.5	9.4.2	Previous Animal Herd Details	Added FateTypeCode and CauseOfFateTypeCode
1.5.5	9.3	Outgoing API Data Types	Move animal identification and herd identification datatypes to a new heading. This separates new datatypes away from the event data
1.5.5	9.3	Cow Identification	Remove Cow Identification from outgoing API mating events. The cow is implied by the event relationship (this data is not shared if bulls change HRP)
1.5.4	14.4.5.8	BRE8	Added all farming object relationship types to BRE8
1.5.4	9.3.1	Animal Identification	Removed Gene Test from outgoing API. This is not been agreed for sharing, and realistically is only for bulls that do not change HRP
1.5.4	5.1.4	NewAnimalEvent	Added Action element to Response Document
1.5.4	9.3.3	Previous Animal Herd Details	Added Previous Animal Herd (and management number) Details to outgoing API
1.5.3	9.3.2	Animal Herd Details	Moved Herd Details from Animal Identification into a separate type
1.5.3	14.4.5.8	BRE8	Added additional documentation for describing the rules for BRE8
1.5.2	9.3.1	Animal Identification	Added Herd Identification and realigned animal herd management number to provide history for that herd
1.5.1	Gen	General	Tidy up of entire document. Removed references to BVE and asynchronous message verification services



version	Ref.	Item	Change Description
1.5.0	14.4.6	BRE7 – BRE11	Added new BRE rules to support Phase 3
1.5.0	5.1	NewAnimalEvent	Added NewAnimalEvent
1.5.0	Gen	General	Added AnimalDurableKey to all animal events. Added new 201906 event versions with appropriate examples. Added permissions sections for animal events. Added Conflicting date ranges for relationship start/end events
1.4.3	9.3.12	RunWithBullEvent	Combine RunWithBullStartEvent and RunWithBullEndEvent into one event
1.4.3	9.3.3	AnimalAncestryEvent	Add notes on ancestry levels
1.4.3	9	Outbound Data	Specified BodyConditionInspectionEvent, LiveweightInspectionEvent, and TraitsOtherThatProductionInspectionEvent as Non-core events
1.4.2	5.1	AnimalEvent	Reset AnimalEvent back to 201501 as the NAIT identifiers are optional
1.4.1	5.1	AnimalEvent	Add NAIT identifiers
1.4.1	9	Outbound Data	Add new outbound data for Animal Events: Animal Identification; Herd Identification; AnimalAncestryEvent; ArtificialInseminationEvent; BodyConditionInspectionEvent; DryingOffEvent; EmbryoTransferEvent; HerdTestEvent; LiveweightInspectionEvent; NaturalMatingEvent; PartuitionEvent; RunWithBullStartEvent; RunWithBullEndEvent; TraitsOtherThatProductionInspectionEvent
1.3.3	5.2	AnimalOfficialABCodeEvent	added new event, for NZAEL MAB application usage only
1.3.3	10	Data Dictionary	added new elements AnimalDurableKey and DateOfABCodeAllocation
1.3.3	12	Reference Data	deleted AnimalIndustryParticipantRelationshipTypeCode "AEP", and added "HR"
1.3.3	12	Reference Data	added new BreedTypeCode "ABO" and "BLA"
1.3.3.	12	Reference Data	added new CauseOfFateTypeCode "TL"
1.3.3.	12	Reference Data	added new HerdIndustryParticipantRelationshipTypeCode "PT"
1.3.2	2.4.1	farm network description	added "PT" Progeny Testing as a valid HerdIndustryParticipant relationship type
1.3.2	5.2	AnimalOfficialABCode event	inserted new event



version	Ref.	Item	Change Description
1.3.2	10	AnimalDurableKey	inserted new element
1.3.2	10	DateOfABCodeAllocation	inserted new element
1.3.2	12	Reference Data	added "PT" Progeny Testing as a valid HerdIndustryParticipantRelationshipTypeCode
1.3.1	5.3	LocationEvent	removed "RegionTypeCode" element i.e. rolled event back to version 201304 in the documentation
1.3.1	8.9	ParturitionEvent	moved "CalfCount" out of the CalvingDetail section into the Parturition section
1.3.0	gen	general	merged with technical specification
1.3.0	gen	general	added XML examples
1.3.0	5.1	AnimalEvent	modified business rule description of AnimalIdentification
1.3.0	5.1.3	AnimalEvent	moved industry identifiers to the <writeelements> section, and changed their order</writeelements>
1.3.0	5.1.3	AnimalEvent	added InternationalIdentifierConstraint
1.3.0	5.1.4	AnimalEvent Retraction	changed to require CDPAnimalIdentifier
1.3.0	5.3	LocationEvent	added "RegionTypeCode" element
1.3.0	6.1	AnimalIdentificationEvent	removed event and cite AnimalEvent as the means to update and Animal's industry identifiers
1.3.0	8.2.3	ArtificialInseminationEvent	added constraint to ensure all bull identifiers listed within the event are unique
1.3.0	8.5.2	MilkingInterval	changed cardinality from "1" to "0 or 1"
1.3.0	8.5.3	EmbryoTransferEvent	added constraints to ensure all embryo sire and embryo recipient identifiers listed within the event are unique
1.3.0	8.6.3	HerdTestEvent	added constraint to ensure all cow identifiers listed within the event are unique
1.3.0	8.9	ParturitionEvent	added CalfCount and SexTypeCode elements
1.3.0	10	CalfCount	added documentation of the field
1.3.0	10	HerdParticipantRelationshipTypeCode	added documentation of the field
1.3.0	10	NorthAmericanHolsteinFriesianPercent	removed obsolete item
1.3.0	10	NZMS1FarmGateIdentifier	corrected typographic error



version	Ref.	Item	Change Description
1.3.0	10	ReferenceDataDescription	removed obsolete item
1.3.0	10	ReferenceDataEndDate	removed obsolete item
1.3.0	10	ReferenceDataStartDate	removed obsolete item
1.3.0	10	ReferenceDataType	removed obsolete item
1.3.0	10	ReferenceDataTypeCode	removed obsolete item
1.3.0	10	RegionTypeCode	added the field
1.3.0	10	TOPYearOfInspection	corrected typographic error
1.3.0	11.3	datetime	corrected formatting and example descriptions to add millisecond precision to time format, and minutes precision to time zone offset format
1.3.0	12	BreedTypeCode	changed "FRI" description to "Friesian"
1.3.0	12	MarketingBreedTypeCode	changed "FRI" description to "Friesian"
1.3.0	12	ParticipantIndustryParticipantTypeCode	added reference data and item "PBSM"
1.3.0	12	RegionTypeCode	added new reference data item and values
1.3.0	13.3	Response SOAP Header	SOAP header changed to include all message header information
1.3.0	13.5.1	BVE1	modified logic for BVE1.1 deleted BVE1.2
1.3.0	13.5.2	BVE2	modified logic for BVE2.1 and 2.3 deleted BVE2.2 and 2.4 renumbered BVE 2.3 to 2.2
1.2.6	10	HerdbookNumber	changed format to variable length, and changed leading characters to "no" on the basis CDPs will strip out leading or trailing spaces
1.2.6	11.3	date	added constraint of earliest allowable date
1.2.6	11.3	datetime	added constraint of earliest allowable time
1.2.5	13.5.1/2	BVE 1 and 2	Removed check on validity of participant code.
1.2.5	13.5.3- 13.5.14	BVE4, 5, 7, 8, 10, 11, 13	added BVE rules
1.2.4	2.4.3	Farming Network Model	removed animal/industry participant relationships for "AEB", "M", "PBS"



version	Ref.	Item	Change Description
1.2.4	10	CDPMessageIdentifier	changed format to "character"
1.2.4	10	International Identification	changed format to "character"
1.2.4	12	AnimalIndustryParticipantRelationshipTypeCode	removed "AEB", "M", "PBS"
1.2.4	12	BreedTypeCode	modified descriptions for "SIM" and "SIP"
1.2.4	12	HerdIndustryParticipantRelationshipTypeCode	removed "PS"
1.2.4	12	MarketingBreedTypeCode	modified descriptions for "SIM" and "SIP"
1.2.3	2.4.2	Farming Network Model	added ET recipient concept and changed existing descriptions for sire and dam
1.2.3	2.4.3	Animal relationship types	modified descriptions of existing types and added embryo transfer recipient as a new type
1.2.3	2.9	Message Data Description Notation	adjusted schema notation description to include bolded text as the mark-up of an event's identifying element(s)
1.2.3	3.3	Event Instruction Constraints	added instruction constraint for farming object identifier events
1.2.3	4.1.1	Animal Identification	merged with information from section 4.1.2, deleted section 4.1.2, and thus removed heading 4.1.1
1.2.3	4.1	Animal Identification	added two elements to the explanatory notes, missed due to documentation error added InternationalIdentifier as a new industry identifier type
1.2.3	4.1	AnimalIdentification	added InternationalIdentifier element and fields
1.2.3	4.1	Animal Identification	simplified CDPAnimalIdentifier element: is now a single field
1.2.3	4.1	Animal Identification	added new constraint for InternationalIdentifier
1.2.3	4.1.2	Animal Identification	removed entire section, on account of merging with section 4.1.1.
1.2.3	4.2.1	Herd Identification	simplified CDPHerdIdentifier element: is now a single field
1.2.3	4.2.2	Herd Identification	simplified CDPHerdIdentifier element: is now a single field
1.2.3	4.3.1	Location Identification	simplified CDPLocationIdentifier element: is now a single field
1.2.3	4.3.2	Location Identification	simplified CDPLocationIdentifier element: is now a single field
1.2.3	4.4.1	Participant Identification	simplified CDPParticipantIdentifier element: is now a single field
1.2.3	4.4.2	Participant Identification	simplified CDPParticipantIdentifier element: is now a single field
1.2.3	5.1.2	AnimalIdentification	marked as the identifying element of the event
1.2.3	5.1.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"



version	Ref.	Item	Change Description
1.2.3	5.1.2	NorthAmericanHolsteinFriesianPercent	deleted, this is an AE-derived field not supplied by HRPs
1.2.3	5.1.2	MarketingBreedTypeCode	deleted, this field supplied from AE enrolment system not HRPs
1.2.3	5.1.4	retraction	added documentation of retraction logic
1.2.3	5.2.2	HerdIdentification	marked as the identifying element of the event
1.2.3	5.2.4	retraction	added documentation of retraction logic
1.2.3	5.3.2	LocationIdentification	marked as the identifying element of the event
1.2.3	5.3.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	5.3.4	retraction	added documentation of retraction logic
1.2.3	5.4.2	ParticipantIdentification	marked as the identifying element of the event
1.2.3	5.4.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	5.4.4	retraction	added documentation of retraction logic
1.2.3	5.5.2	IndustryParticipantIdentification	marked as the identifying element of the event
1.2.3	5.5.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	5.5.4	retraction	added documentation of retraction logic
1.2.3	5.6	ReferenceDataEvent	event deprecated: data managed using manual process
1.2.3	7.1.2	ProgenyIdentification AncestorIdentification AnimalAncestryTypeCode	marked as the identifying elements of the event
1.2.3	7.1.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	7.1.2	OfficialIndicatorTypeCode	changed code cardinality to "0 or 1" i.e. optional
1.2.3	7.1.4	retraction	added documentation of retraction logic
1.2.3	7.2.2	Related Animal I dentification Date Of Animal Herd Start	marked as the identifying elements of the event
1.2.3	7.2.2	DateOfAnimalHerdStart	moved element position
1.2.3	7.2.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"



version	Ref.	Item	Change Description
1.2.3	7.2.4	retraction	added documentation of retraction logic
1.2.3	7.3.2	Related Animal Identification Date Of Animal Herd End	marked as the identifying elements of the event
1.2.3	7.3.2	DateOfAnimalHerdEnd	moved element position
1.2.3	7.3.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	7.3.4	retraction	added documentation of retraction logic
1.2.3	7.4.2	RelatedAnimalIdentification DateOfAnimalHerdManagementNumberStart	marked as the identifying elements of the event
1.2.3	7.4.2	DateOfAnimalHerdManagementNumberStart	moved element position
1.2.3	7.4.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	7.4.4	retraction	added documentation of retraction logic
1.2.3	7.5.2	RelatedAnimalIdentification DateOfAnimalHerdManagementNumberEnd	marked as the identifying elements of the event
1.2.3	7.5.2	DateOfAnimalHerdManagementNumberEnd	moved element position
1.2.3	7.5.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	7.5.4	retraction	added documentation of retraction logic
1.2.3	7.6.2	Related Animal I dentification Related Industry Participant I dentifier Date Of Animal Industry Participant Start Animal Industry Participant Relationship Type Code	marked as the identifying elements of the event
1.2.3	7.6.4	retraction	added documentation of retraction logic
1.2.3	7.7.2	Related Animal I dentification Related Industry Participant I dentifier Date Of Animal ndustry Participant End Animal Industry Participant Relationship Type Code	marked as the identifying elements of the event
1.2.3	7.7.4	retraction	added documentation of retraction logic



version	Ref.	Item	Change Description
1.2.3	7.8.2	Related Herdldentification Related Industry Participant I dentifier Date Of Herd Industry Participant Start Herd Industry Participant Relationship Type Code	marked as the identifying elements of the event
1.2.3	7.8.4	retraction	added documentation of retraction logic
1.2.3	7.9.2	Related Herdldentification Related Industry Participant I dentifier Date Of Herd Industry Participant End Herd Industry Participant Relationship Type Code	marked as the identifying elements of the event
1.2.3	7.9.4	retraction	added documentation of retraction logic
1.2.3	7.10.2	RelatedHerdIdentification DateOfHerdLocationStart	marked as the identifying elements of the event
1.2.3	7.10.2	DateOfHerdLocationStart	moved element position
1.2.3	7.10.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	7.10.4	retraction	added documentation of retraction logic
1.2.3	7.11.2	RelatedHerdIdentification DateOfHerdLocationEnd	marked as the identifying elements of the event
1.2.3	7.11.2	DateOfHerdLocationEnd	moved element position
1.2.3	7.11.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	7.11.4	retraction	added documentation of retraction logic
1.2.3	7.12.2	RelatedHerdIdentification RelatedParticipantIdentification DateOfHerdParticipantStart HerdParticipantRelationshipTypeCode	marked as the identifying elements of the event
1.2.3	7.12.4	retraction	added documentation of retraction logic
1.2.3	7.13.2	RelatedHerdIdentification RelatedParticipantIdentification DateOfHerdParticipantEnd HerdParticipantRelationshipTypeCode	marked as the identifying elements of the event
1.2.3	7.13.4	retraction	added documentation of retraction logic



version	Ref.	Item	Change Description
1.2.3	7.14.2	Related Participant I dentification Related Industry Participant I dentifier Date Of Particpant Industry Participant Start Participant Industry Participant Relationship Type Code	marked as the identifying elements of the event
1.2.3	7.14.4	retraction	added documentation of retraction logic
1.2.3	7.15.2	Related Participant I dentification Related Industry Participant I dentifier Date Of Participant Industry Participant End Participant Industry Participant Relationship Type Code	marked as the identifying elements of the event
1.2.3	7.15.4	retraction	added documentation of retraction logic
1.2.3	8.1.2	Cowldentification DateOfArtificialInsemination	marked as the identifying elements of the event
1.2.3	8.1.2	DateOfArtificialInsemination	moved element position
1.2.3	8.1.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	8.1.2	ArtificialInseminationEvent	deleted explanatory note, because schema is now supportable without a "fictitious" attribute
1.2.3	8.1.4	retraction	added documentation of retraction logic
1.2.3	8.2.2	Cowldentification DateOfInspection	marked as the identifying elements of the event
1.2.3	8.2.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	8.2.4	retraction	added documentation of retraction logic
1.2.3	8.3.2	DateOfLactationDriedOff	added a new field "DateOfLactationDriedOff" to act as the date that informs the uniqueness of the event, being the start date of the lactation for which the drying off event occurred
1.2.3	8.3.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	8.3.2	DryingOffDate	changed the description of "DryingOffDate" and cardinality to reflect that it is an optional attribute, and that it does not inform the uniqueness of the event
1.2.3	8.3.2	CowIdentification DateOfLactationDriedOff	marked as the identifying elements of the event
1.2.3	8.3.4	retraction	added documentation of retraction logic
1.2.3	8.4.2	EmbryoImplantSerialNumber	moved element position



version	Ref.	Item	Change Description
1.2.3	8.4.2	EmbryoImplantSerialNumber	marked as the identifying element of the event
1.2.3	8.4.2	EmbryoImplantSerialNumber	changed cardinality to "1" i.e. mandatory
1.2.3	8.4.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	8.4.2	EmbryoRecipientIdentification	changed cardinality to "1 to many"
1.2.3	8.4.2	EmbryoTransferEvent	deleted explanatory note, because schema is now supportable without a "fictitious" attribute
1.2.3	8.4.4	retraction	added documentation of retraction logic
1.2.3	8.5.2	HerdTestValidIndicator	moved from herd test to animal level, and made mandatory
1.2.3	8.5.2	MilkingInterval	moved from herd test to animal level, and made mandatory
1.2.3	8.5.2	SampleRegimeTypeCode	moved from herd test to animal level
1.2.3	8.5.2	TestedHerdIdentification DateOfHerdTest	marked as the identifying elements of the event
1.2.3	8.5.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	8.5.4	retraction	added documentation of retraction logic
1.2.3	8.6.2	Cowldentification DateOfInspection	marked as the identifying elements of the event
1.2.3	8.6.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	8.6.4	retraction	added documentation of retraction logic
1.2.3	8.7.2	BullIdentification	changed cardinality to optional
1.2.3	8.7.2	Cowldentification DateOfNaturalMating	marked as the identifying elements of the event
1.2.3	8.7.2	DateOfNaturalMating	moved element position
1.2.3	8.7.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	8.7.4	retraction	added documentation of retraction logic
1.2.3	8.8.2	CalvingActualIndicator AbnormalCalvingCircumstancesTypeCde CalvingAssistanceTypeCode	moved to calving detail repeating element



version	Ref.	Item	Change Description
1.2.3	8.8.2	DamIdentification DateOfParturition	marked as the identifying elements of the event
1.2.3	8.8.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	8.8.4	retraction	added documentation of retraction logic
1.2.3	8.9.2	BullIdentification	changed cardinality to optional
1.2.3	8.9.2	Cowldentification DateOfRunWithBullStart	marked as the identifying elements of the event
1.2.3	8.9.2	DateOfRunWithBullStart	moved element position
1.2.3	8.9.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	8.9.4	retraction	added documentation of retraction logic
1.2.3	8.10.2	BullIdentification	changed cardinality to optional
1.2.3	8.10.2	CowIdentification DateOfRunWithBullEnd	marked as the identifying elements of the event
1.2.3	8.10.2	DateOfRunWithBullEnd	moved element position
1.2.3	8.10.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	8.10.4	retraction	added documentation of retraction logic
1.2.3	8.11.2	Cowldentification DateOfInspection	marked as the identifying elements of the event
1.2.3	8.11.2	WriteElements	inserted new container element to encapsulate elements needed for "writes"
1.2.3	8.11.2	TOPScore	amended cardinality to 1 - 18
1.2.3	8.11.4	retraction	added documentation of retraction logic
1.2.3	10	AHBYearOfTag	changed format to "yearYY"
1.2.3	10	AnimalName	format changed to "{character}1 – 255"
1.2.3	10	CDPAnimalIdentifier	
1.2.3	10	CDPHerdldentifier	
1.2.3	10	CDPLocationIdentifier	



version	Ref.	Item	Change Description
1.2.3	10	CDPParticipantIdentifier	
1.2.3	10	DateOfBirth	included this field which was missing from the table
1.2.3	10	DateOfDryingOff	name changed to "DryingOffDate"
1.2.3	10	DateOfLactationDriedOff	new
1.2.3	10	DryingOffDate	new name of field "DateOfDryingOff"
1.2.3	10	InternationalIdentification	added field
1.2.3	10	ParticipantIndustryParticipantRelationshipTypeCode	format changed to "{alphanumeric}1 – 255"
1.2.3	10	SystemIdentifier	field removed, not required due to simplification to CDP ids
1.2.3	10	TOPYearOfInspection	changed format to "year"
1.2.3	11.2	uppercase alphabet excluding vowels	added "Y" to the definition
1.2.3	11.2	year	changed format to "{digit}4"
1.2.2	11.2	yearYY	added new format, being "{digit}2"
1.2.3	11.3	New Zealand map series 1	definition corrected to "S" or "N" not "E" or "N"
1.2.3	12	reference data type names	made names consistent with event definitions i.e. added the suffiix "Code" where required
1.2.3	12	AbnormalTestTypeCode	made descriptions lower case
1.2.3	12	AEIncludeIndicator	added reference data item and values
1.2.3	12	AnimalAncestryTypeCode	changed existing sire and dam codes and descriptions
1.2.3	12	AnimalAncestryTypeCode	added a code and description for ET recipient relationships
1.2.3	12	AnimalIndustryParticipantRelationshipTypeCode	removed codes "AEB", "M", "PBS"
1.2.3	12	BreedTypeCode	added breed types
1.2.3	12	CauseOfFateTypeCode	removed "CE"
1.2.3	12	MarketingBreedTypeCode	added marketing breed types
1.2.3	12	CalvingActualIndicatorCode	correction to description "estimated"
1.2.3	13.2	SOAP Header	added documentation
1.2.3	13.3	Synchronous Rules	added documentation



version	Ref.	Item	Change Description
1.2.3	13.4.1	BVE1	removed EventInstruction constraint
1.2.3	13.4.1	BVE1.4	deleted reference to DOB check form existing rule
1.2.3	13.4.2	BVE2	removed EventInstruction constraint
1.2.3	13.4.2	BVE2.3	added new sub-rule: the rules previously numbered 2.3 and 2.4 are now numbered 2.4. and 2.5 respectively
1.2.3	13.4.2	BVE2.6	new sub-rule
1.2.1b	5.1.2	constraints	added documentation of uniqueness constraints
1.2.1b	5.3.2	constraints	added documentation of uniqueness constraints
1.2.1b	8.8.2	constraints	added documentation of uniqueness constraints
1.2.1b	8.11.2	constraints	added documentation of uniqueness constraints
1.2.1b	10	IndustryParticipantDescription	format changed to "{character}1 – 255"
1.2.1b	10	ParticipantCode	changed format to "{uppercase alphabet excluding vowels}3 – 4"
1.2.1b	10	ParticipantDescription	format changed to "{character}1 – 255"
1.2.1b	10	ReferenceDataDescription	format changed to "{character}1 – 255"
1.2.1b	10	RoadEntranceDescription	format changed to "{character}1 – 255"
1.2.1b	11.2	uppercase vowels	corrected non-terminal description and removed assignment of terminal symbol "Y"
1.2.1b	11.2	punctuation	deleted, no longer required
1.2.1b	11.2	alphabetic	deleted, no longer required
1.2.1b	11.3	character	definition changed from "ISO/IEC 8859-1" to "ISO/IEC 10646" i.e. ASCII to UNICODE
1.2.1	10	Score	changed format to {digit}1, ".", {digit}2
1.2.1	12	MarketingBreedType	added additional values
1.2	4.3.1	CDPLocationIdentifier	changed cardinality to "0 or 1" i.e. optional
1.2	4.3.1	CertifiedDataProviderIdentifer	changed cardinality to "1" i.e. mandatory
1.2	4.3.2	CDPLocationIdentifier	changed typo in name
1.2	7.1.2	AncestorIdentification	changed cardinality to "0 or 1" i.e. optional
1.2	7.1.2	OfficialIndicatorTypeCode	changed cardinality to "1" i.e. mandatory



version	Ref.	Item	Change Description
1.2	7.2.2	HerdParticipantCode	deleted
1.2	7.3.2	HerdParticipantCode	deleted
1.2	7.4.2	HerdParticipantCode	deleted
1.2	7.5.2	HerdParticipantCode	deleted
1.2	7.8.2	HerdParticipantCode	deleted
1.2	7.9.2	HerdParticipantCode	deleted
1.2	7.10.2	HerdParticipantCode	deleted
1.2	7.11.2	HerdParticipantCode	deleted
1.2	7.12.2	HerdParticipantCode	deleted
1.2	7.13.2	HerdParticipantCode	deleted
1.2	8.2.2	DateOfInspection	changed cardinality to "1" i.e. mandatory
1.2	8.2.2.	Score	changed cardinality to "1" i.e. mandatory
1.2	8.3.2	DryingOffReasonTypeCode	changed cardinality to "0 or 1" i.e. optional
1.2	8.5.2	HerdParticipantCode	deleted
1.2	8.6.2	Liveweight	changed cardinality to "1" i.e. mandatory
1.2	8.8.2	CalfTagNumber	deleted
1.2	8.11.2	TOPRegistrationCode	deleted
1.2	8.11.2	TOPScore	changed cardinality to "18"
1.2	8.11.2	Score	change cardinality to "1" i.e. mandatory
1.2	10	AHBNumber	changed field format to {digit}1 – 7
1.2	10	AnimalManagementNumber	changed field format to {digit}1 - 5
1.2	10	BirthIdentificationNumber	changed field format to {digit}1 - 5
1.2	10	HerdParticipantCode	deleted
1.2	10	LIAHerdCode	changed format to {digit}1 – 6
1.2	10	LIAHerdRegion	changed format to {alphanumeric}1 – 3



version	Ref.	Item	Change Description
1.2	10	Liveweight	changed format to {digit}1 – 4, ".", digit
1.2	10	Score	changed format to {digit}1, no leading zeros
1.2	12	all	removed brackets from short codes: all approved in principal
1.2	12	AbnormalCalvingCircumstancesType	changed description of "I" to "induced"
1.2	12	AbnormalTestType	changed typo in name & deleted "0" "null value"
1.2	12	AlleleType	changed short codes to "+" and "-"
1.2	12	CalvingActualIndicator	added reference data item and values
1.2	12	CalvingAssistanceType	deleted "0" "null value"
1.2	12	CauseOfFateType	deleted "null" "no reason" & added many more values
1.2	12	CommentType	added "CS"
1.2	12	CountryOfOrigin	changed typo in name
1.2	12	DateOfBirthConfidenceIndicatorType	changed typo in name & added values "3" and "4"
1.2	12	DryingOffReasonType	deleted "null" "not specified"
1.2	12	FateOfCalfType	added "C" and deleted "F" and "H"
1.2	12	FateType	deleted "null" "not specified"
1.2	12	MarketingBreedType	changed definition to be a unique data item, added values
1.2	12	MatingChargeType	added all codes and descriptions
1.2	12	OfficialIndicatorType	renamed some values to be gender agnostic
1.1	2.4.3	Farming Network Model	Animal ancestry relationship "is born to a recipient dam" deleted. Only genetic animal relationships will be held in the network model.
1.1	2.4.3	Farming Network Model	animal/industry participant relationship description modified to "is enrolled for AE services with"
1.1	2.4.3	Farming Network Model	added animal/industry participant relationship "is marketed by"
1.1	2.4.3	Farming Network Model	added animal/industry participant relationship "is enrolled by"
1.1	2.4.3	Farming Network Model	new herd/industry participant relationship "is a member of a progeny proving scheme operated by"
1.1	4	Farming Object Identifications	renamed elements from "identification" to "identifier"



version	Ref.	Item	Change Description
1.1	4.1.1	LIAHerdRegion	added to LIA identification element
1.1	4.1.1	HerdbookAnimalSex	added to Herdbook identification element
1.1	4.1.1	AnimalHealthBoardIdentification	added new identification element including fields
1.1	4.1.2	AnimalHealthBoardIdentification	added new identification element including fields
1.1	4.3.1	CDPLocationIdentifier	corrected cardinality to mandatory
1.1	5.1.2	AnimalEvent	deleted AnimalManagementNumber
1.1	5.1.2	AnimalEvent	deleted AnimalMarketerName
1.1	5.1.2	AnimalEvent	deleted ABEnrolleeName
1.1	5.6.2	ReferenceDataEvent	added ReferenceDataStartDate
1.1	8.1.2	ArtificalInseminationEvent	added MatingChargeTypeCode
1.1	8.5.2	HerdTestEvent	renamed PretestMilkingDateStamp
1.1	8.6.2	LiveweightInspectionEvent	deleted LiveweightIndicator
1.1	8.8.2	ParturitionEvent	added CalvingActualIndicator
1.1	8.8.2	ParturitionEvent	deleted SexTypeCode
1.1	10	LIAHerdRegion	format changed to {digit}3
1.1	11.2	year	defined as {digit}1 - 4
1.1	12	AlleleType	deleted "carrier"
1.1	12	AnimalAncestryType	deleted "is born to a recipient dam"
1.1	12	AnimalIndustryParticipantRelationshipType	renamed "AEW" and changed description "is enrolled for AE services with"
1.1	12	AnimalIndustryParticipantRelationshipType	added "AEB", "is AE enrolled by"
1.1	12	AnimalIndustryParticipantRelationshipType	added "M", "is marketed by"
1.1	12	CalvingActualIndicator	added reference data item and values
1.1	12	CauseOfFateType	multiple additions
1.1	12	CauseOfFateType	changed existing descriptions to lower case
1.1	12	DryingOffReasonType	changed existing descriptions to lower case



version	Ref.	Item	Change Description
1.1	12	FateType	multiple additions
1.1	12	HerdIndustryParticipantRelationshipType	added "PS", "is a member of a progeny proving scheme operated by"
1.1	12	HerdtestValidIndicator	added reference data item and values
1.1	12	OfficialIndicatorType	multiple additions
1.1	12	SampleRegimeType	changed existing descriptions to lower case
1.1	12	SexType	changed existing descriptions to lower case
1.1	12	SystemType	SystemType all its values deleted