



THE GLOBAL STANDARD
FOR LIVESTOCK DATA

Procedure 2 of Section 15 of ICAR Guidelines – Milking Data Services

Procedure 2 – Milking Data

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Table of Contents

| | | |
|----------|--|-----------|
| 1 | Introduction..... | 4 |
| 2 | Definitions and Terminology..... | 4 |
| 3 | Scope | 4 |
| 4 | Common Components..... | 5 |
| 4.1 | MilkCharacteristicsType | 5 |
| 4.2 | MilkCharacteristicsLocalType..... | 5 |
| 5 | Exchange of Milking Event Data..... | 6 |
| 5.1 | Purpose..... | 6 |
| 5.2 | Request description..... | 6 |
| 5.3 | AnimalMilkingResults | 7 |
| 5.4 | Characteristics..... | 8 |
| 5.5 | AnimalMilkingSample | 8 |
| 5.6 | QuarterMilking | 9 |
| 5.7 | Response description..... | 10 |
| 6 | Exchange of Milk Analysis Result Data | 12 |
| 6.1 | Purpose..... | 12 |
| 6.2 | Request Description | 12 |
| 6.3 | Response Description..... | 13 |
| 6.4 | AnimalMilkingLabResult..... | 14 |
| 6.5 | Characteristics..... | 15 |
| 6.6 | AnimalMilkingSample | 15 |
| 6.7 | QuarterMilking | 15 |

Tables

| | |
|---|---|
| Table 1. Definitions of Terms used in these guidelines..... | 4 |
|---|---|

Figures

| | |
|---|----|
| Figure 1. Scope of Guideline..... | 4 |
| Figure 2 MilkCharacteristicsType | 5 |
| Figure 3 MilkCharacteristicsLocalType | 5 |
| Figure 4 UpdateMilkingResultRequest..... | 6 |
| Figure 5 AnimalMilkingSample..... | 8 |
| Figure 6 QuarterMilking | 9 |
| Figure 7 UpdateMilkingResultResponse | 10 |
| Figure 8 GetMilkingLabResultsRequest..... | 12 |
| Figure 9 MilkingLabResultRequestType | 12 |
| Figure 10 GetMilkingLabResultsResults | 13 |
| Figure 11 QuarterMilking | 15 |

Summary of Changes

| Date of Change | Nature of Change |
|----------------|--|
| July 2018 | New procedure created from methodology chapter in Section 15 Overview. Replaced by new version from ADE-WG. Template applied. |
| February 2019 | Prepared for consideration by General Assembly. Approved on the basis of Procedures and Appendices being updated periodically under control of ADE WG. |

1 Introduction

The milking, milk sampling and milk analysis process is a fundamental part of dairy performance recording. Automatic, fast and reliable data exchange is a pre-requisite for effective monitoring of dairy herds.

The business process “Exchange of Milking Data” is designed to

- a. Exchange data linked to a milking event
- b. Exchange data linked to milk analysis

It provides several methods designed to help synchronizing the equipment data base and the farm management database without efforts:

- a. **UpdateMilkingResult:** Transfer details on milking events, milk sampling and on farm measurements
- b. **GetMilkingLabResults:** Request the results of a milk sample analysis done in a laboratory

The service descriptions follow the principals described in “Guideline 1 Methodology” - [link here](#) - and reuse the basic elements defined there.

The complete description of the codelists referenced here can be found in Appendix A ([link here](#)) data dictionary.

2 Definitions and Terminology

Table 1 contains a list of important definitions for terms and abbreviations used in these guidelines.

Table 1. Definitions of Terms used in these guidelines.

| Term | Definition |
|------|------------|
| | |

3 Scope

Figure 1 gives a pictorial summary of the main elements of this guideline. The numbers in this figure refer to the heading numbers of this procedure.

Figure 1. Scope of Guideline.

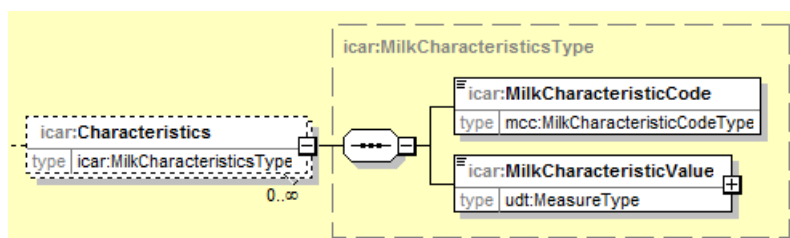
4 Common Components

4.1 MilkCharacteristicsType

The component Characteristics conveys a list of milking characteristics. A characteristic of type MilkCharacteristicsType is used here as a synonym for the results of a measurement or a classification applied to a milk sample, on farm or in a laboratory. It can also be used for recording parameters describing of the environmental situation or the status of the cows during the milking process, e.g. weight of the animal during milking.

The characteristic is identified by a unique code which references a characteristic definition according to code list “ICAR_MilkCharacteristicCode”. Table “Milk Characteristics Codes” in section “Annex.ICAR Milk Characteristics Codes” lists a basic set of ICAR defined characteristics. It can easily be extend by locally used characteristic definitions.

Figure 2 MilkCharacteristicsType



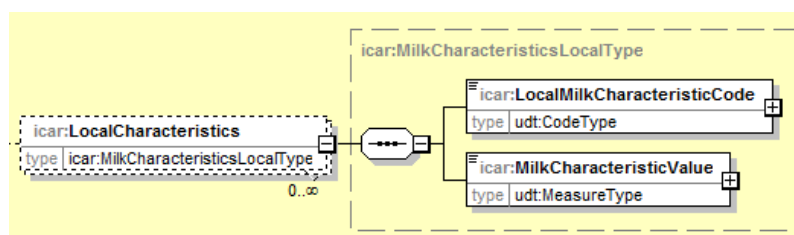
- a. **MilkCharacteristicCode:** The mandatory identifier of a milk characteristic.
- b. **MilkCharacteristicValue:** A milk characteristic measure value. The attribute “unitCode” must be set according to the table “Milk Characteristics Codes”

4.2 MilkCharacteristicsLocalType

Similar to MilkCharacteristicsType this container conveys a list of locally used milking characteristics which are not part of the official “ICAR Milk Characteristics Codes” list.

- a. **LocalMilkCharacteristicCode:** The mandatory identifier of a local milk characteristic. The codelist must be provided locally.
- b. **MilkCharacteristicValue:** A milk characteristic measure value.

Figure 3 MilkCharacteristicsLocalType



5 Exchange of Milking Event Data

Service Description: UpdateMilkingResult

5.1 Purpose

To allow the owner of the equipment to have registered by an external information system:

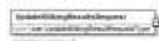
- a. Milking results
- b. Links between animal identifiers and those of bottles of milk sample in order to register later the results of the milk laboratory.
- c. Results of on farm measurements and milk analysis

5.2 Request description

Message UpdateMilkingResultRequest (see diagram below) is in compliance with the general specifications for requests (see General specifications / Request specifications).

It is used to send new or changed data of one or more milking events to the service provide.

Figure 4 UpdateMilkingResultRequest



5.3 AnimalMilkingResults

`AnimalMilkingResult` conveys the main feature of a given milking:

- a. **AnimalIdentity:** One unique animal identifier used for data exchange holding id and label of the milked animal. The ID optionally references entity AnimalDetail transported by Service “UpdateAnimal” if required for further animal details.
- b. **Location:** One milking location ID identifying the location where the animal has been milked. The ID optionally references an entity LiveStockLocation transported by Service UpdateLiveStockLocation if required for further location details.

- c. **MilkingParlourUnit, MilkingBoxNumber**: optionally identify the location of milking more detailed
- d. **MilkingStartingTime, MilkingDuration, MilkingVisitDuration, MilkingType, MilkingMilkWeight, MilkingSuccess**: Items describing the milking itself:
- e. **Characteristics**: Milk characteristics (classification or measurements) which are conveyed by the entity **MilkCharacteristics**. In principal it is a list of key value pairs with keys identifying the type of characteristics and the values holding the result. The current list of characteristics key definitions is shown in table “Milk Characteristic Codes”
- f. **LocalCharacteristics**: Locally defined milk characteristics (classification or measurements) which are conveyed by the entity LocalCharacteristics. It conveys a list of locally used milking characteristics which are not part of the official “ICAR Milk Characteristics Codes” list.
- g. **QuarterMilking**: Up to four optional entities quarter milking results, optionally including a quarter milk samples and quarter milk characteristics. This result may not be provided by every equipment.
- h. **AnimalMilkingSample** : One optional entity describing the details of a sample of milk taken for laboratory analyses
- i. **MilkingDeviceID**: One optional item holds an id of the device used for milking. The ID optionally references an entity Device transported by Service “UpdateDevice” if required for further device details.
- j. **MeasureDeviceID**: One optional item holds an id of the device used for measuring. The ID optionally references an entity Device transported by Service “UpdateDevice” if required for further device details.
- k. **LocalAdditionalData**: Optional list of key/value pairs used in a local context as described in section “Common Components – Local Adaptions”

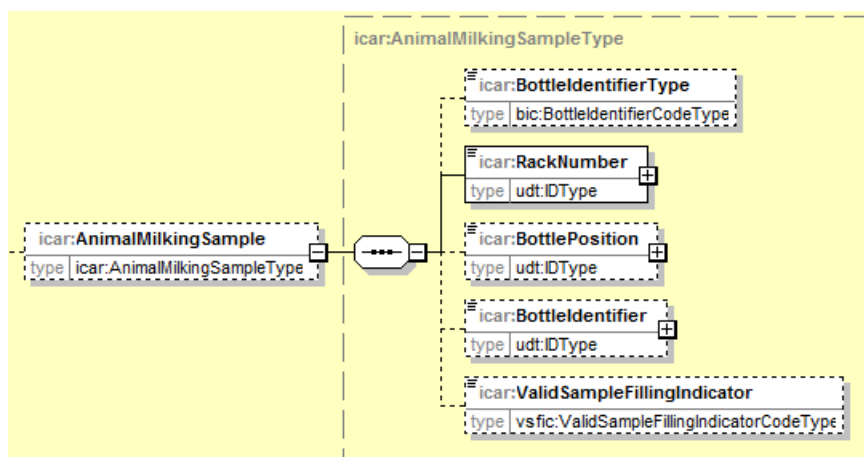
5.4 Characteristics

The entity conveys the milk characteristics recorded during the milking event.

For details see the description of “MilkCharacteristicsType” in section “Common Components” above.

5.5 AnimalMilkingSample

Figure 5 AnimalMilkingSample

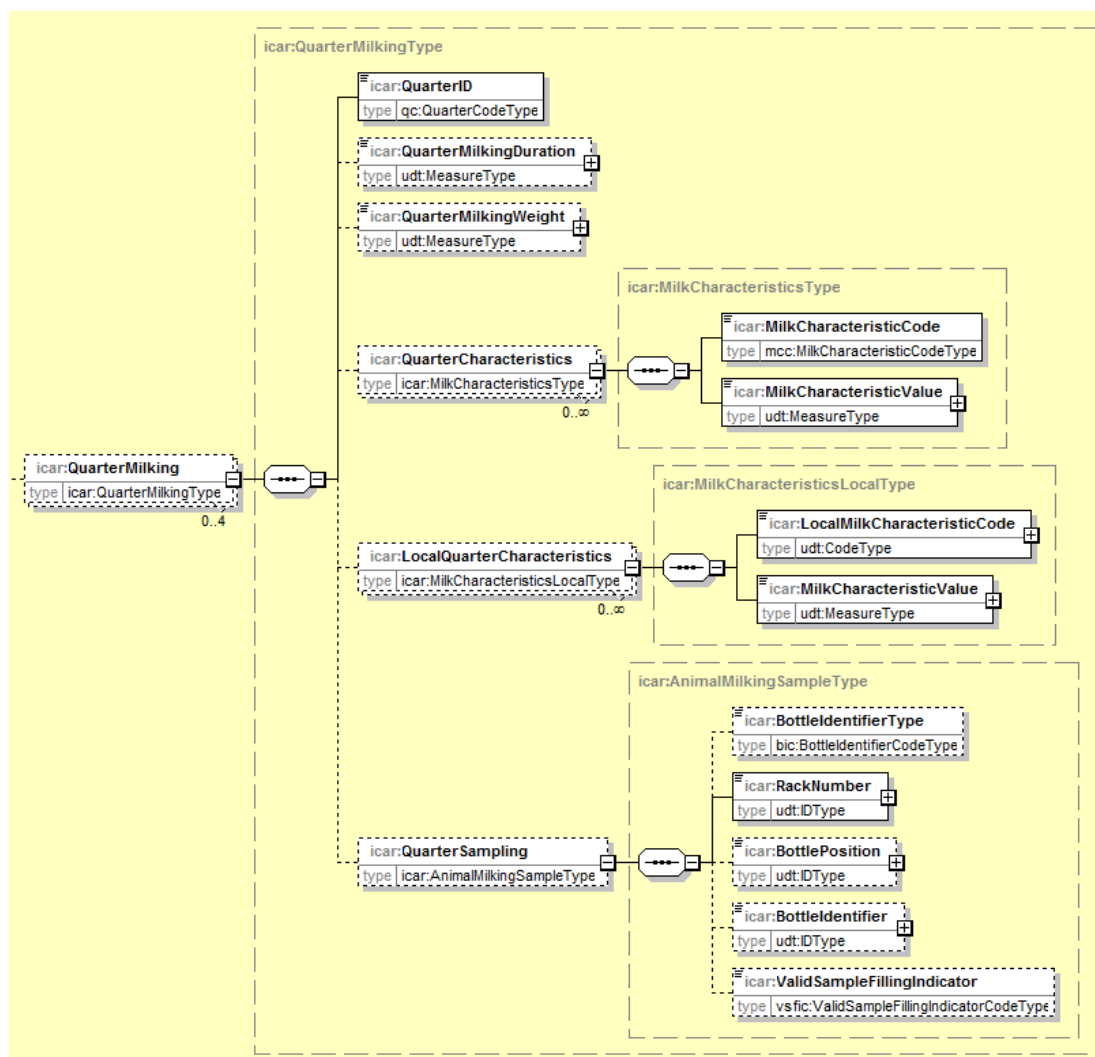


The entity gives the identification and the main features of a milk sample.

- a. **BottleIdentifierType:** The type of bottle identifier according to code list “BottleIdentifierCodeType”
- b. **RackNumber:** Number of the sample rack
- c. **BottlePosition:** Position of the bottle in the sample rack
- d. **BottleIdentifier:** Bottle identifiers read from barcode or RFID
- e. **ValidSampleFillingIndicator:** Indicator of valid sample filling compared with expected value according to code list “ValidSampleFillingIndicatorCodeType”

5.6 QuarterMilking

Figure 6 QuarterMilking

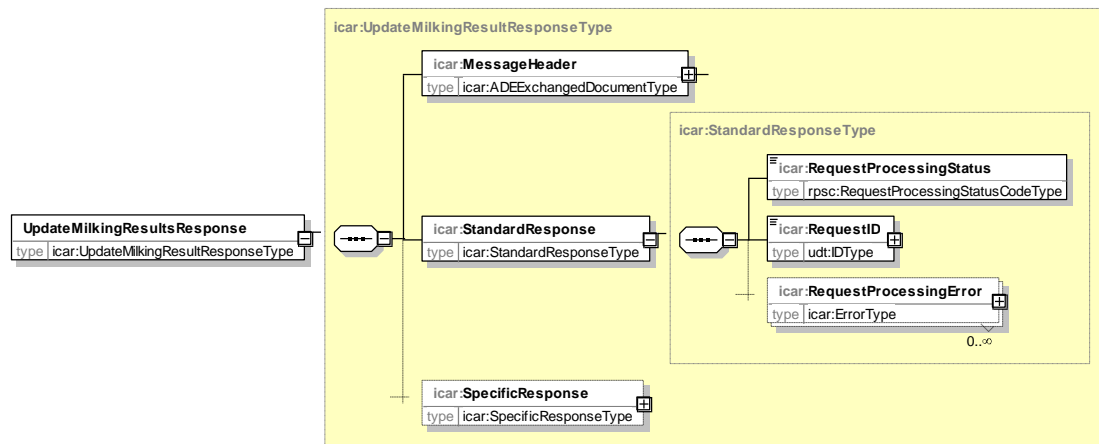


The entity QuarterMilking gives the milking result and optionally sampling and characteristic details for one of four given quarters.

- a. **QuarterID:** Identification of the quarter for which the results apply (1..4)
- b. **QuarterMilkingDuration:** Milking duration of the quarter, default unit seconds
- c. **QuarterMilkingWeight:** Milk weight of the quarter, default unit kg
- d. **QuarterCharacteristics:** Milk characteristics of the quarter. For details see description of entity Characteristics above.
- e. **LocalQuarterCharacteristics:** Locally used milk characteristics of the quarter. For details see description of entity LocalCharacteristics above.
- f. **QuarterMilkingSample :** One optional entity describing the details of a sample of milk taken from the quarter for laboratory analyses. For details see description of entity AnimalMilkingSample above.

5.7 Response description

Figure 7 UpdateMilkingResultResponse



6 Exchange of Milk Analysis Result Data

Service Description: GetMilkingLabResults

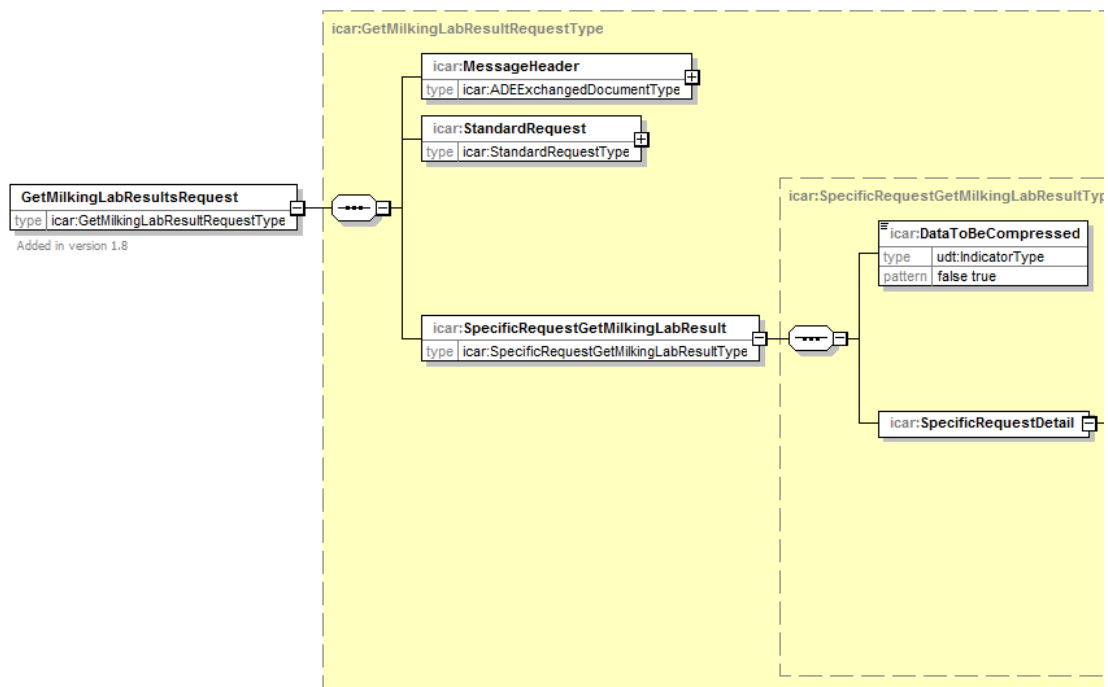
6.1 Purpose

To allow the owner of the equipment to retrieve the analysis results of milk samples from an external information system for herd management and calibration purposes. The link between the sample identification and analysis results must be provided by the information system of the MRO.

6.2 Request Description

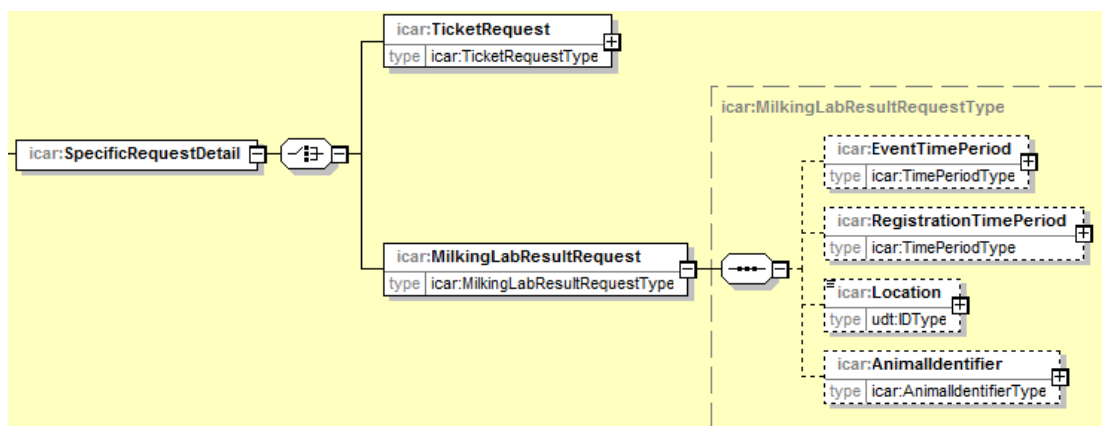
Message **GetMilkingLabResultsRequest** (see diagram below) is in compliance with the general specifications for requests (see General specifications / Request specifications).
 It is used to request the results of a laboratory analysis stored in the farm management system.

Figure 8 GetMilkingLabResultsRequest



The size of the response can be controlled by request parameters in **MilkingLabResultRequestType** (see diagram below):

Figure 9 MilkingLabResultRequestType



- a. **Location:** The identification of the farm for which laboratory results are requested
- b. **AnimalIdentifier:** The animal id for which laboratory results are requested
- c. **EventTimePeriod:** Period of sampling moments at which the requested results have been sampled
- d. **RegistrationTimePeriod:** Period of registration moments at which the requested results have been registered at the farm management system

It is the responsibility of the farm management system to define the requirements and the valid ranges for these parameters.

6.3 Response Description

Message GetMilkingLabResultsResults (see diagram below) is in compliance with the general specifications for results (see General specifications / Response specifications)

It is used to receive the results of a laboratory milk sample analysis stored by the service provider. Since the registration of a milk sample at a farm management system or a laboratory is done by the entity AnimalMilkingSample its returned data in entity AnimalMilkingLabResults is very similar to this entity. Instead of characteristics recorded on the equipment however characteristics based on a laboratory analysis are returned.

Figure 10 GetMilkingLabResultsResults



6.4 AnimalMilkingLabResult

AnimalMilkingLabResult conveys the main feature of a given milking analysis result:

- a. **AnimalIdentity:** One unique animal identifier used for data exchange holding id and label of the milked animal. The ID optionally referenes an entity AnimalDetail transported by Service “**UpdateAnimal**” if required for further animal details.
- b. **Location:** One milking location ID identifying the location where the animal has been milked The ID optionally referenes an entity LiveStockLocation transported by Service UpdateLiveStockLocation if required for further location details.
- c. **MilkingStartingDateTime:** The precise time of the milking and sampling
- d. **Characteristics:** Milk lab analysis characteristics (classification or measurements) which are conveyed by the entity MilkCharacteristics. In principal it is a list of key value pairs with keys identifying the type of characteristics and the values holding the result.

The current list of characteristics key definitions is shown in table “Milk Characteristic Codes”

- e. **LocalCharacteristics:** Locally defined milk characteristics (classification or measurements) which are conveyed by the entity LocalCharacteristics. It conveys a list of locally used milking characteristics which are not part of the official “ICAR Milk Characteristics Codes” list.
- f. **QuarterMilking:** For analysis results of quarter specific samples. Up to four optional entities quarter milking results, optionally including a quarter milk sample and quarter milk analysis characteristics.
- g. **AnimalMilkingSample :** One optional entity describing the details of a sample of milk taken for laboratory analyses
- h. **MilkingDeviceID:** One optional item holds an id of the device used for milking. The ID optionally references an entity Device transported by Service “UpdateDevice” if required for further device details.
- i. **MeasureDeviceID:** One optional item holds an id of the device used for measuring. The ID optionally references an entity Device transported by Service “UpdateDevice” if required for further device details.
- j. **MeasureDeviceID:** One optional item holds an id of the device used for measuring. The ID optionally references an entity Device transported by Service “UpdateDevice” if required for further device details.
- k. **LabAnalyzerModelCode:** Specifies the model of the milk analyzing instrument
- l. **LabAnalysisDateTime:** Date and time of the analysis of this sample.
- m. **LocalAdditionalData:** Optional, unlimited number of locally used key/value pairs

6.5 Characteristics

The entity conveys the milk characteristics produced by a laboratory analysis of a given milking. The characteristics is identified by a unique code which references a characteristics definition in the table “Milk Characteristics Codes”, a basic set of ICAR defined characteristics. It can easily be extend by special laboratory specific definitions.

For details see the description of “MilkCharacteristicsType” in section “Common Components” above.

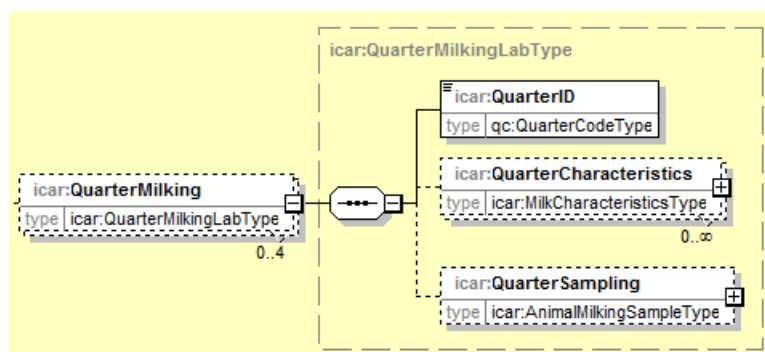
6.6 AnimalMilkingSample

The entity AnimalMilkingSample conveys details of the sampling of the milk on the equipment for which the laboratory analysis has been done. It provides the data given in the process of milking result registration at the farm management system. This helps the equipment in verifying the link between sampling on the equipment and results provided by the farm management system.

For details see the description of “Entity AnimalMilkingSample” in section “Milking Results”.

6.7 QuarterMilking

Figure 11 QuarterMilking



The entity **QuarterMilking** of type **QuarterMilkingLabType** gives the laboratory analysis result and sampling details for one of four given quarters.

- a. **QuarterID**: Identification of the quarter for which the results apply (1..4)
- b. **QuarterCharacteristics**: Milk characteristics of the quarter. For details see description of entity Characteristics above.
- c. **QuarterSampling** : One optional entity describing the details of a sample of milk taken from the quarter for laboratory analyses. For details see description of entity AnimalMilkingSample above