# MILK RECORDING SAMPLE VIALS AND CONTAINERS

## Results of 2002 Questionnaire for ICAR member organisations

**ICAR Sub-Committee on Milk Meters and Jars**
**ICAR Working Group on Milk Testing Laboratories**

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# 1 INTRODUCTION

In March 2002 a meeting was organised with representatives from milk recording organisations and central milk testing laboratories in Sweden, Denmark, Germany (Niedersachsen), The Netherlands and Belgium (Flanders). A number of aspects and developments were identified that supported the strive for further (inter)national harmonisation in materials for sampling and analysis:

- economy of (a larger) scale can result in a lower cost per unit for sample materials;
- the world-wide penetration in the market of new milk-meters (Lactocorder, TruTest), equipped with sampling devices. Harmonisation in sample vials may limit costs for development and otherwise needed adaptations;
- the growing number of automated milking systems (AMS, VMS), accompanied by the introduction of automated sampling devices. International harmonisation in the basic sampling format can promote further development with reduced costs and efforts;
- new concepts for laboratory processing of samples appearing on the world-wide market;
- the temporary transition of analytical activities in case of calamities in laboratories. A harmonised format for sample vials and containers will certainly reduce exchange problems under such stressful circumstances.

The participants in the meeting agreed to seek wider support during the biennial ICAR Sessions that were held in Interlaken (CH) in May 2002. ICAR Board members indicated their support in taking further initiatives under the aegis of the ICAR Sub-Committee on Meters and Jars and the ICAR Working Group on Milk Testing Laboratories.

As a first step, it was decided to make an inventory on the sample materials in use with ICAR members. The questionnaire (see enclosure 1) was prepared by Harrie van den Bijgaart (NL) and Uffe Lauritsen (DK) and was issued to ICAR members in October 2001. This report provides an overview and a brief discussion of the gathered data.

# 2 RESULTS

## 2.1 General

33 replies were received from 27 countries. In many cases replies were representative for the whole country, but also partial replies (i.e. Canada, Switzerland and Ireland) were received. It is also apparent that in a number of replying countries more than one system is used (i.e. Belgium, Germany, Denmark, Spain, Ireland, Italy, Sudan and Tunisia).

The individual results are presented in enclosure 3.

## 2.2 Sample vials

The total volume of sample vials ranges from 14 ml (NL) up to 70 ml (HR and CY). Even 250 ml was mentioned (SDN). Milk volumes vary between 10 and 250 ml. The majority of milk volumes is between 20 and 40 ml.

Vial material is generally plastic, in most cases polypropylene. It is indicated that vials are generally equipped with loose caps. It must be noted that this question may have been misinterpreted, where people have assumed that a septum-like closure was meant with the term ‘fixed’.

The height of the used vials ranges from 60 to 160 mm with a majority between 80 and 100 mm.

Apart from Spain (partly), the Netherlands and Sudan, the internal diameter of the vials varies within a rather narrow range of 20 to 30 mm, where for the maximum external diameter 2 to 16 mm has to be added.

Hardly any country reports on the use specific vials, like dedicated vials for AMS/VMS.

### 2.3 Containers at sampling

Both strips and rectangle/square shaped containers are used in sampling, respectively 8 and 26 out of 33 replies.

Strips do contain 5, 8, 10 or 20 positions. The height of the strip varies between 40 and 84 mm with a heart-to-heart distance between 31 and 50 mm.

Rectangle/square shaped containers contain 2 to 10 rows with 5 to 13 positions per row. 10 positions per row are most predominant. The height of the rack varies between 40 and 165 mm. The heart-to-heart distance within rows and between rows is rather similar. Apart from NL and SD this ranges from 31 to 45 mm with a majority between 35 and 45 mm.

Switzerland reports on the use of containers where sample vials are in a lying position. Other specific racks are hardly used. Only in countries with operational AMS/VMS (Belgium, Germany, Denmark, Spain, the Netherlands and Sweden) some dedicated formats are found.

### 2.4 Containers at analysis

Many replies indicate that racks/containers at sampling are different from those at analysis. This means that samples are transferred from one format to the other between sampling and analysis.

At analysis, strips do pop up more frequently, 21 out of 33 replies. Strips generally contain 10 or 20 positions. The height of the strips varies between 32 and 84 mm, where heart-to-heart distance is found to be between 35 and 55 mm with a majority around 40 mm.

Rectangle/square shaped racks do contain 5 to 8 rows with 10 to 12 positions each. Their height varies between 40 and 110 mm. Again, the heart-to-heart distance within rows and between rows is rather similar with a majority between 30 and 40 mm.

In two cases the use of Foss manufactured strips is mentioned.

### 2.5 Sample identification

Sample identification by rack and position number and individual sample identification are mentioned in about equal numbers.

## 3 FURTHER ACTION

These results and will be evaluated and proposals for a follow-up will be prepared by representatives from the ICAR Sub-committee Meters and Jars and the ICAR Working Group on Milk Testing Laboratories in due time.

**Acknowledgement**

The provided input by many ICAR members and concerned employees is gratefully acknowledged.

# ICAR QUESTIONNAIRE ON MILK RECORDING SAMPLE VIALS AND CONTAINERS

## Questionnaire for ICAR member organisations

**GUIDANCE FOR REPLIES**

1. This questionnaire has been created by members of the ICAR Sub-Committee on Meters and Jars and the ICAR Working Group on Milk Testing Laboratories. Please complete it as fully as you can.

2. If feasible, the enclosure of pictures and drawings of vials and containers with a clear indication of the key dimensions would be appreciated.

3. In case more than one type of vial and containers is applied in your country, you are requested to indicate roughly the number of milk recording samples per year with each of the alternatives. Make a clear and consequent distinguishment throughout the questionnaire, for instance by using headers such as system 1, system 2, etc.

4. After completion, please return this questionnaire to:

   **Netherlands Milk Control Station**
   **att. H. van den Bijgaart**
   **P.O. Box 119**
   **7200 AC ZUTPHEN**
   **The Netherlands**

   Tel. +31 575 595695
   Fax +31 575 543889
   e-mail: vandenbijgaart@mcs-nederland.nl

5. Thank you for your co-operation!

## 1 Sample vials

**1.1 What is the total volume of the vial for milk recording samples:** .....ml

**1.2 What is the nominal milk volume for milk recording samples:** .....ml

**1.3 Material of the vial**

- ❑ glass
- ❑ plastic, if possible please indicate type of plastic
  - ❑ polycarbonate
  - ❑ polyethylene
  - ❑ polypropylene
  - ❑ polysulfone
  - ❑ other plastic, .....
- ❑ other, .....

**1.4 Caps/stoppers for the vials**

type:

- ❑ individual
  - ❑ loose, i.e. not fixed to the vial
  - ❑ fixed, i.e. connected by a hinge
- ❑ in one piece for all vials in a container, i.e. a gliding strip over the vials or a cover for the whole rack/container
- ❑ other, .....

material:

- ❑ same as the vial
- ❑ rubber stopper
- ❑ other, .....

**1.5 Dimensions of the vial**

| | |
|---|---|
| height | : ..... mm |
| internal diameter at the top | : ..... mm |
| maximum external diameter including cap/stopper | : ..... mm |

**1.6 Specific vials**

Are specific vials in use for certain milk meters or with automated milking systems

- ❑ no
- ❑ yes (please indicate differences)

**1.7 Manufacturer/supplier of sample vials and caps/stoppers**

Name:

Address:

## 2 Sample racks/containers

### 2.1 Racks/containers at sampling

#### 2.1.1 Racks/containers in regular milk recording

- ❑ strips (1 row)

  number of positions : ..... positions

  height of the rack : ..... mm

  heart-to-heart distance between positions in a row (dc) : ..... mm

- ❑ rectangle- or square-shaped racks

  number of rows : ..... rows

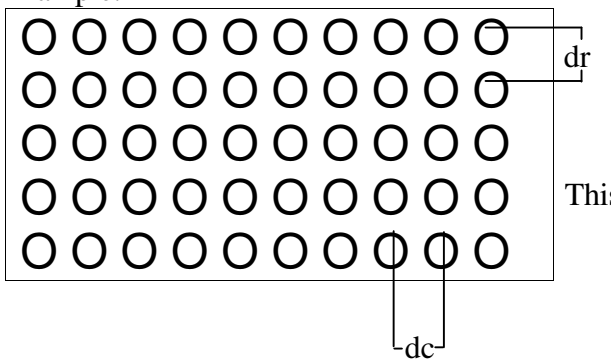
  number of columns (= positions per row) : ..... columns

  height of the rack : ..... mm

  heart-to-heart distance between positions in a row (dc) : ..... mm

  heart-to-heart distance between rows (dr) : ..... mm

Example:




This example rack contains:

- 5 rows
- 10 columns

- ❑ other racks/containers (please draw with indication of dimensions, number of vials and heart-to-heart distance between vials)

### 2.1.2 Specific racks/containers at sampling

Are specific racks/containers in use for certain milk meters or automated milking systems.

- ❑ no
- ❑ yes (please indicate differences)

### 2.2 Racks/containers at analysis

- ❑ strips (1 row)

  number of positions : ..... positions

  height of the rack : ..... mm

  heart-to-heart distance between positions in a row (dc) : ..... mm

- ❑ rectangle- of square-shaped racks

  number of rows : ..... rows

  number of columns (= positions per row) : ..... columns

  height of the rack : ..... mm

  heart-to-heart distance between positions in a row (dc) : ..... mm

  heart-to-heart distance between rows (dr) : ..... mm

- ❑ other racks/containers (please draw with indication of dimensions, number of vials and heart-to-heart distances between vials)

## 3 Sample identification

### 3.1 Means of sample identification

- ❑ rack/container number and position number
- ❑ individual coding of sample vials

## 4. Name and address of contact person

### 4.1 Further correspondence about this questionnaire can be addressed to:

| | |
|---|---|
| Organisation | : |
| Post address | : |
| ZIP code/City | : |
| Country | : |
| Contact person | : |
| Phone | : |
| Fax | : |
| E-mail | : |

**Enclosure 2**

## Summary of results ICAR Questionnaire on milk recording sample vials and containers 2002

**Country abbreviations (ISO 3166):**

| | |
|---|---|
| BE | Belgium |
| CA | Canada |
| CH | Switzerland |
| CY | Cyprus |
| DE | Germany |
| DK | Denmark |
| EE | Estonia |
| ES | Spain |
| FI | Finland |
| FR | France |
| GB | United Kingdom |
| HR | Croatia |
| HU | Hungary |
| IE | Ireland |
| IL | Israel |
| IT | Italy |
| JE | Jersey |
| KR | South Korea |
| NI | North Ireland |
| NL | Netherlands |
| NZ | New Zealand |
| SD | Sudan |
| SE | Sweden |
| TN | Tunesia |
| US | United States |
| ZA | South Africa |
| ZW | Zimbabwe |

**Other abbreviations:**

| | |
|---|---|
| dc | heart-to-heart distance between positions in a row in mm |
| dr | heart-to-heart distance between rows in mm |
| h | height in mm |
| n.r. | not reported |

**Enclosure 3**

**Summary of results ICAR Questionnaire**
**on milk recording sample vials and containers 2002**

| | BE (Flanders) | BE (Wallone) | CA (Quebec) | CH (Fleckvieh) | CY | DE | DK (1) | DK (2) | EE | ES | FI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. Sample vials** | | | | | | | | | | | |
| total volume of the vial (ml) | 42 | 32 | 48 | 50 | 70 | 30-60 mostly 50 | n.r. | 24 | 50 | 40-60 | 35 |
| nominal milk volume (ml) | 28 | 20-30 | 42 | 40 | 50 | 25-40 mostly 40 | 30 | 18 | 40 | 30-50 | 30 |
| vial material | glass | polyeth. | polyprop. | polyprop. | polyprop. | polyeth. polyprop. | polyprop. | polyeth. | polyeth. | glass, polyeth. polyprop. | plastic |
| type caps/stoppers | ind. loose | ind. loose | ind. fixed | ind. other | ind.loose | ind.loose | gliding strip | ind. fixed | ind. loose | ind. loose | ind.loose |
| material caps/stoppers | plastic | polyeth. | polyprop. | polyprop. | polyprop. | polyeth. polyprop. rubber other | polyprop. | polyeth. | polyeth. | polyeth., polyprop. polystyr. | plastic |
| vial height (mm) | ± 80 | 60 | 88 | 96 | 83 | 98-105 | 80 | 70 | 80 | 65-90 | 65 |
| vial internal diameter (mm) | 20 | 23 | 30 | 26 | 30 | 22-26 | 26 | 23 | 28 | 25-35 | 28 |
| vial max. external diameter (mm) | 26 | 32 | 45 | 30 | 32 | 27-32 | 31 | 28 | 34 | 28-39 | 66 |
| specific vials | yes, polycarbonate vials with Delaval VMS | no | no | no | no | mostly no/ polyprop. vials with barcode/ vials with rubber cap or metal bottom | no | no | no | no | no |

**Enclosure 3**

**Summary of results ICAR Questionnaire**
**on milk recording sample vials and containers 2002**

| | FR | GB | HR | HU | IE (1) | IE (2) | IL | IT (1) future standard | IT (2) | JE | KR | NI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. Sample vials** | | | | | | | | | | | | |
| total volume of the vial (ml) | 32 | 35 | 70 | 50 | 30 | 40 | 60 | 50 | 50 | 35 | 30 | 50 |
| nominal milk volume (ml) | 28 | 30 | 40 | 45 | 26 | 30 | 45-50 | 50 | 50 | 20 | 20 | 30 |
| vial material | polyprop. | polyprop. | polyprop. | polyeth. polyprop. | plastic | plastic | polyprop. | polyprop. | polyprop. | polyprop. | polyprop. | polyprop. |
| type caps/stoppers | ind.loose | ind.loose | ind.loose | ind.loose | ind.loose | ind.loose | ind.loose | ind. fixed | ind.loose | ind. loose | ind.loose | ind.fixed |
| material caps/stoppers | rubber st. | polyeth. | rubber | polyeth. polyprop. | plastic | plastic/ rubber | polyprop. | polyprop. | polyeth. | polyprop. | polyprop. | polyprop. |
| vial height (mm) | 62,2 | 65 | 104 | 91 | 60 | 80 | 100 | 85 | 90 | 65 | 65 | 65 |
| vial internal diameter (mm) | 28 | 28 | 24 | 30 | 28 | 27 | 30 | 28 | 28 | 23 | 30 | 28 |
| vial max. external diameter (mm) | 32 | 35 | 32 | 32 | 34 | 33 | 37 | 46 | 30 | 35 | 35 | 35 |
| specific vials | no | no | no | no | no | no | different colors for cow, sheep, goat | no | no | no | no | no |

**Enclosure 3**

**Summary of results ICAR Questionnaire**
**on milk recording sample vials and containers 2002**

| | NL | NZ | SD (1) | SD (2) | SE | TN (1) | TN (2) | US | ZA | ZW |
|---|---|---|---|---|---|---|---|---|---|---|
| **1. Sample vials** | | | | | | | | | | |
| total volume of the vial (ml) | 14 | 30 | n.r. | 250? | n.r. | 60 | 40 | 50 | 35 | 35 |
| nominal milk volume (ml) | 10 | 30 | n.r. | 250? | 18 | 40 | 40 | 40 | 15 | n.r. |
| vial material | glass | polyprop. | glass/ plastic ? | glass/ plastic | polyprop. | polyprop. | polyprop. | polyprop. | polyprop. | polyeth.? |
| type caps/stoppers | ind.loose | ind. loose | ind. loose | ind. loose | gliding strip | ind. loose | ind.loose | ind.loose | ind.loose | fixed |
| material caps/stoppers | rubber | polyeth. | rubber stopper | foil paper | polyprop. | polyprop. | polyprop. | polyprop. | softer plastic | polyeth. |
| vial height (mm) | 80 | 75 | 100 | 160 | 80 | 72 | 70 | 95 | 65 | 80 |
| vial internal diameter (mm) | 15 | 25 | 15 | 100? | 22 | 30 | 28 | 30 | 28 | 28 |
| vial max. external diameter (mm) | 22 | 32 | 16 | n.r. | 27 | 34 | 34 | 34 | 37 | 34 |
| specific vials | no | no | no | no | no | no | no | no | no | no |

**Summary of results ICAR Questionnaire**
**on milk recording sample vials and containers 2002**

| | BE (Flanders) | BE (Wallone) | CA (Quebec) | CH (Fleckvieh) | CY | DE | DK (1) | DK (2) | EE | ES | FI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2. Sample racks/containers** | | | | | | | | | | | |
| racks/containers at sampling | | | | | | | | | | | |
| strips | | | | | x | x | | | | x | |
| number of positions | | | | | 10 | 10-18 | | | | 20 | |
| height of the rack (mm) | | | | | 42 | 52-70 | | | | 40 | |
| heart-to-heart distance (mm) | | | | | 45 | 31-35 | | | | 50 | |
| rectangle/square shaped racks | x | x | | | | x | x | x | x | x | x (disposable cardboard) |
| no. rows | 5 | 6 | | | | 6-10 | 5 | 5 | 8 | 4-10 | 4 |
| no. columns | 10 | 12 | | | | 7-12 | 10 | 10 | 10 | 5-10 | 6 |
| height of the rack (mm) | 100 | 70 | | | | 40-165 | n.r. | 90 | 150 | 43-100 | 70 |
| heart-to-heart distance in row (mm) | ± 40 | 35 | | | | 30-35 | 34 | 30 | 40 | 40-45 | 40 |
| heart-to-heart distance between rows (mm) | ± 40 | 35 | | | | 33-36 | 36 | 34 | 40 | 40-47 | 40 |
| other racks | | | | x (vials lying) | | | | | | | |
| no. rows | | | | 3 rows (2x6,1x7) | | | | | | | |
| no. columns | | | | | | | | | | | |
| height of the rack (mm) | | | | | | | | | | | |
| heart-to-heart distance in row (mm) | | | | | | | | | | | |
| heart-to-heart distance between rows (mm) | | | | | | | | | | | |
| specific racks | yes, with Delaval VMS 5 rows x 10 vials h=±85, dc=±32, dr=±37 | yes Lely AMS, 90 vials | | no | no | no except for AMS shuttles | yes AMS shuttles | no | no | yes, Lely shuttle 10 rows, 6 columns dr=21,dc=47 | no |

**Summary of results ICAR Questionnaire**
**on milk recording sample vials and containers 2002**

| | FR | GB | HR | HU | IE (1) | IE (2) | IL | IT (1) future standard | IT (2) | JE | KR | NI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2. Sample racks/containers** | | | | | | | | | | | | |
| racks/containers at sampling | | | | | | | | | | | | |
| strips | | x | | | | | x | x | | | | x |
| number of positions | | 10 | | | | | 5 | 10 | | | | 10 |
| height of the rack (mm) | | 50 | | | | | 40 | 84 | | | | 50 |
| heart-to-heart distance (mm) | | 36 | | | | | 40 | 42 | | | | 35 |
| rectangle/square shaped racks | x | | x | x | x | x | | | x | x | x | |
| no. rows | 8 | | 5 | 10 | 5 | 8 | | | 2 | 5 | 5 | |
| no. columns | 12 | | 13 | 10 | 10 | 10 | | | 9 | 10 | 10 | |
| height of the rack (mm) | 80 | | 120 | 95 | 80 | 60 | | | 92 | 50 | 45 | |
| heart-to-heart distance in row (mm) | 35 | | 38 | 32,1 | 40 | 45 | | | 35 | 37 | 35 | |
| heart-to-heart distance between rows (mm) | 35 | | 38 | 32,1 | 40 | 40 | | | 35 | 35 | 35 | |
| other racks | | | | | | | | | | | | |
| no. rows | | | | | | | | | | | | |
| no. columns | | | | | | | | | | | | |
| height of the rack (mm) | | | | | | | | | | | | |
| heart-to-heart distance in row (mm) | | | | | | | | | | | | |
| heart-to-heart distance between rows (mm) | | | | | | | | | | | | |
| specific racks | no | no | no | no | no | no | no | no | no | no | no | no |

**Summary of results ICAR Questionnaire**
**on milk recording sample vials and containers 2002**

| | NL | NZ | SD (1) | SD (2) | SE | TN (1) | TN (2) | US | ZA | ZW |
|---|---|---|---|---|---|---|---|---|---|---|
| **2. Sample racks/containers** | | | | | | | | | | |
| racks/containers at sampling | | | | | | | | | | x |
| strips | | | | | | | | | | |
| number of positions | | | | | | | | | | 8 |
| height of the rack (mm) | | | | | | | | | | n.r. |
| heart-to-heart distance (mm) | | | | | | | | | | 40 |
| rectangle/square shaped racks | x | x | x | x | x | x | x | x | x | x |
| no. rows | 4 | 6 | 2 | 2 | 6 | 6 | 5 | 6 | 8 | 5 |
| no. columns | 9 | 6 | 6 | 6 | 10 | 10 | 10 | 10 | 10 | 10 |
| height of the rack (mm) | 65 | 90 | 155 | 120 | n.r. | 90 | 60 | 40 | 70 | 65 |
| heart-to-heart distance in row (mm) | 24 | 60 | 33 | 40 | 31 | 35 | 40 | 45 | 35 | 40 |
| heart-to-heart distance between rows (mm) | 27 | 60 | 39 | 35 | 32 | 35 | 40 | 45 | 35 | 40 |
| other racks | | | | | | | | | | x |
| no. rows | | | | | | | | | | 5 |
| no. columns | | | | | | | | | | 8 |
| height of the rack (mm) | | | | | | | | | | n.r. |
| heart-to-heart distance in row (mm) | | | | | | | | | | 40 |
| heart-to-heart distance between rows (mm) | | | | | | | | | | 40 |
| specific racks | yes AMS shuttles | no | no | no | yes AMS shuttles | no | no | no | no | no |

**Summary of results ICAR Questionnaire**
**on milk recording sample vials and containers 2002**

| | BE (Flanders) | BE (Wallone) | CA (Quebec) | CH (Fleckvieh) | CY | DE | DK (1) | DK (2) | EE | ES | FI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **2. Sample racks/containers** | | | | | | | | | | | |
| racks/containers at analysis | | | | | | | | | | | |
| strips | | | x | | x | x | | | x | x | |
| number of positions | | | 18 | | 10 | 10-20 mostly 20 | | | 20 | 10-20 | |
| height of the rack (mm) | | | 80 | | 42 | 45-110 mostly 50 | | | 47 | 40-49 | |
| heart-to-heart distance (mm) | | | 45 | | 45 | 25-43 mostly 40 | | | 40 | 40-47 | |
| rectangle/square shaped racks | x | x | | | | | x | x | | | |
| no. rows | 5 | 6 | | | | | 5 | 5 | | | |
| no. columns | 10 | 12 | | | | | 10 | 10 | | | |
| height of the rack (mm) | 100 | 70 | | | | | n.r. | 90 | | | |
| heart-to-heart distance in row (mm) | ± 40 | 35 | | | | | 34 | 30 | | | |
| heart-to-heart distance between rows (mm) | ± 40 | 35 | | | | | 36 | 34 | | | |
| other racks | | | | x (Foss) | | x (circular racks with 90 vials) | | | | x (Foss) | |
| number of positions | | | | 20 | | | | | | 20 | |
| height of the rack (mm) | | | | | | | | | | 40 | |
| length of the rack (mm) | | | | | | | | | | 800 | |
| heart-to-heart distance (mm) | | | | | | | | | | 40 | |
| **3. Sample identification** | rack/pos. (+cow number) | rack/pos ind. vials | ind. vials barcode | ind. vials barcode | rack/pos. | rack/pos. (mostly)/ barcode (AMS) | rack/pos. | rack/pos. | rack/pos. | rack/pos. ind. vials | ind. vials incl. cow ID |

**Summary of results ICAR Questionnaire**
**on milk recording sample vials and containers 2002**

| | FR | GB | HR | HU | IE (1) | IE (2) | IL | IT (1) future standard | IT (2) | JE | KR | NI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2. Sample racks/containers** | | | | | | | | | | | | |
| racks/containers at analysis | | | | | | | | | | | | |
| strips | x | x | x | x | | x | x | x | x | x | x | x |
| number of positions | 20 | 10 | 20 | 20 | | 15 | 20 (4x5) | 10 | 18 | 10 | 10 | 10 |
| height of the rack (mm) | 50 | 50 | 50 | 45 | | 55 | 40 | 84 | 45 | 32 | 42 | 50 |
| heart-to-heart distance (mm) | 40 | 36 | 40 | 40 | | 55 | 40 | 42 | 50 | 40 | 38 | 35 |
| rectangle/square shaped racks | | | | | x | | | | | | | |
| no. rows | | | | | 5 | | | | | | | |
| no. columns | | | | | 10 | | | | | | | |
| height of the rack (mm) | | | | | 40 | | | | | | | |
| heart-to-heart distance in row (mm) | | | | | 40 | | | | | | | |
| heart-to-heart distance between rows (mm) | | | | | 40 | | | | | | | |
| other racks | | | | | | | | | | | | |
| number of positions | | | | | | | | | | | | |
| height of the rack (mm) | | | | | | | | | | | | |
| length of the rack (mm) | | | | | | | | | | | | |
| heart-to-heart distance (mm) | | | | | | | | | | | | |
| **3. Sample identification** | ind. vials | rack/pos. | ind. vials | rack/pos. | rack/pos. | ind. vials | rack/pos. | ind. vials barcode | ind. vials numbers | rack/pos. ind. vials | ind. vials | ind.vials |

**Summary of results ICAR Questionnaire**
**on milk recording sample vials and containers 2002**

| | NL | NZ | SD (1) | SD (2) | SE | TN (1) | TN (2) | US | ZA | ZW |
|---|---|---|---|---|---|---|---|---|---|---|
| **2. Sample racks/containers** | | | | | | | | | | |
| racks/containers at analysis | | | | | | | | | | |
| strips | | | | | | x | x | x | x | x |
| number of positions | | | | | | 20 | 20 | 18-20 | 20 | 20 |
| height of the rack (mm) | | | | | | 42 | 40 | 51 | 40 | 50 |
| heart-to-heart distance (mm) | | | | | | 40 | 45 | 45 | 40 | 40 |
| rectangle/square shaped racks | x | x | x | x | x | | | | | |
| no. rows | 8 | 8 | 3 | 2 | 6 | | | | | |
| no. columns | 12 | 12 | 6 | 6 | 10 | | | | | |
| height of the rack (mm) | 110 | 100 | 153 | 120 | n.r. | | | | | |
| heart-to-heart distance in row (mm) | 24 | 34 | 33 | 40 | 31 | | | | | |
| heart-to-heart distance between rows (mm) | 24 | 34 | 39 | 35 | 32 | | | | | |
| other racks | | | | | | | | | | |
| number of positions | | | | | | | | | | |
| height of the rack (mm) | | | | | | | | | | |
| length of the rack (mm) | | | | | | | | | | |
| heart-to-heart distance (mm) | | | | | | | | | | |
| **3. Sample identification** | rack/pos. | ind. vials | ind. vials | ind. vials | rack/pos. | ind. vials | ind. vials | rack/pos. | rack/pos. | ind. vials |