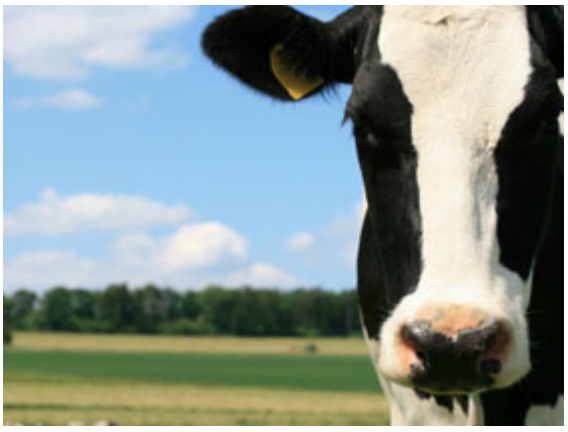
# Annual report of the UK National Reference Laboratory for the testing of milk and milk products.



## 2013-2014

**Contents:**

# Annual report of the UK National reference Laboratory for the testing of milk and milk products.

The National Reference Laboratory (NRL) for the testing of milk and milk products for the UK is currently based at the Agri-Food and Biosciences Institute (AFBI) in Belfast, Northern Ireland.

The role of the NRL, as it is for all respective NRLs in other Member States, is to provide monitoring for the enforcement of EU Directive 882/2004 on official controls performed to ensure the verification of compliance with food and feed law, animal health and animal welfare rules. The ultimate aim is to promote fair trade both within and between Member States within the EU.

| | |
|---|---|
| **Report Number:** | AFBI/NRLREPORT/2013-2014 |
| **Authors:** | L. Moran, C. Kelly, RH Madden. |
| **Date:** | April 2014 |
| **Sponsor:** | Food Standards Agency<br>Aviation house<br>125 Kingsway<br>London<br>WC2B 6NH |
| **Project number:** | PAU/222 |
| **NRL Auditor:** | Dr Linda Farmer |
| **Lead Scientist:** | Dr RH Madden |
| **Project Manager:** | Mrs Lynn Moran |
| **NRL Support:** | Mrs Carmel Kelly |
| **Distribution:** | 1. Mrs Chelvi Leonard (FSA)<br>2. Dr. Linda Farmer (AFBI). |

## Introduction

This report provides an outline of the work of the UK-NRL over the financial year 2013 to 2014. The UK-NRL acknowledges the support of the FSA and the help of AFBI in fulfilling its duties. On the top tier in the hierarchy of enforcement authorities within the European Union is the EU Reference Laboratory (EU-RL) for Milk and Milk Products which is based in Maisons-Alfort, Paris, France and funded directly by the EU Commission. This Laboratory is responsible for monitoring the performance of the reference laboratories in Member States and within the UK the NRL is based in the Agri-Food and Biosciences Institute in Belfast, UK. Each of the NRLs is, in turn, responsible for the performance of Official Control Laboratories (OCLs) situated within their jurisdiction. Both the Member State NRLs and OCLs are funded by their respective Government departments for testing performed under the relevant legislation. An OCL is defined as a laboratory which generates results which can be used by the competent authority for enforcement purposes under the requisite EU directives. The object of the whole exercise is to facilitate fair trade both within and between member states of the EU and ultimately to ensure the safety of the public and protect them from fraudulent practices. It also acts as a contact point for those countries outside the EU who wish to export dairy products into the region.

The core functions of the UK-NRL include:

- Secretariat Services.
- Advice and representation within the UK/EU.
- Production of standard operating procedures, codes of practice and guidance documents at the request of the FSA.
- Compliance assessment via audits and ring trials.
- Co-ordination within the UK of EURL initiatives.
- Communication of results and data use.
- Additional services and tasks as requested by the FSA.

The responsibilities therefore of the UK-NRL are:

- Dissemination of information coming from the EU-NRL. The circulation of a questionnaire to the UK national OCLs about their activities ensures that only relevant information is circulated to them and reduces any unnecessary burden of administration.
- Provision of expert advice to the FSA or OCLs as required.
- Participation in workshops organised by the EU-RL on topics of concern.
- Dissemination of relevant changes to British Standard (BSI) and International Standard Organisation (ISO) standards to the OCLs. The participation of the Lead Scientist of the UK-NRL on BSI Technical Committees AW/9 and AW/5 facilitates this function.
- Participation in ring trials organised by the EU-RL to ensure the satisfactory performance of the member state NRLs.
- Participation in practical assessments to aid the formulation of EU legislation.
- Monitoring the performance of national OCLs. The majority of these labs within the UK are accredited to ISO17025 by United Kingdom Accreditation Service (UKAS) for the analyses they perform under the requisite EU legislation. This requires internal and external independent audit and satisfactory performance in internal and external quality assurance schemes to assure the laboratories proficiencies in the tests undertaken.

## Provision of Reports to the UK-FSA

Reports on all UK-NRL activities have been provided to the FSA on a monthly and quarterly basis. Monthly reports were usually by a short email report while the quarterly ones were more comprehensive. They were sent electronically to the NRL project manager and any matters arising discussed at greater length.
Meetings were also held between FSA and NRL representatives to discuss general matters in June 2013 and again in January 2014 to specifically discuss details on the study to establish a UK conversion factor.

## Establishment of UK-NRL Website

It is a statutory requirement for NRLs to have a website and therefore at the request of the FSA one was created for the UK-NRL. This site is now 'live' and reflects information on the core roles of the NRL, relevant legislation, NRL activities, EU-RL activities and links to any other relevant sites. It allows a mechanism for disseminating information to all interested parties and will be updated on an on-going basis as new information and reports become available.

Link to UK-NRL Website: www.**afbini**.gov.uk/index/services/services-diagnostic.../**milk**-**nrl**.htm

## Establishment of a Dedicated UK-NRL email Address

A dedicated NRL email address was created and is now in full operation. This ensures email correspondence to and from the NRL is separated from general AFBI email and to ensure security it is restricted to access by NRL staff only. The NRL inbox is visible at all times during normal working hours and checked regularly therefore ensuring correspondents receive a rapid response.

E-Mail: Milk_NRL_UK@afbini.gov.uk

## 16th Workshop of the NRLs for milk and milk products

The UK-NRL Lead Scientist attended the 16th Workshop on 3rd to 4th October 2013 at the headquarters of the EU-RL at Maisons-Alfort in Paris. The main topic of the workshop was pasteurisation tracers. A full report is attached in Appendix 1.

## Alkaline Phosphatase Activity in Cheese

**Study on Alkaline Phosphatase (AP) Determination in Cheese - Impact of the preparation of the test sample on the overall variability of the results**

In April 2013 the UK-NRL was invited by the EU-RL to participate in the study to determine the effect of sample preparation of two hard and two soft cheeses on AP results (Appendix 2). A power point presentation is attached in Appendix 3 compiling the design and the results (UK-NRL is Lab C) of the study. The UK-NRL returned results below the expected values however after receiving more detailed instructions on sample preparation it was clear that the initial method was open to misinterpretation and could explain the results obtained. This has highlighted that exact instructions are required to ensure consistency between laboratories and that sample preparation is indeed a critical factor in the overall protocol.

**Proficiency Trials (PT) on the determination of the Alkaline Phosphatase activity in cheese**

EU-RL Milk and Milk Products / Pasteurization Tracers invited the UK-NRL to participate in an inter-laboratory proficiency trial in December 2013. (Appendix 4)
The aim of this trial was to assess the NRL's ability to determine the alkaline phosphatase activity in cheese according to the method sent by EU-RL for 8 samples of cheese (6 portions of hard cheese and 2 portions of semi-hard cheese). Samples were also provided for calibration (hard and semi-hard cheese from pasteurized cow milk). A preliminary report has been issued (Appendix 5) and the UK-NRL (Lab Code 8) had mixed

results indicating again that sample preparation is problematic depending on the type of cheese.

Participation in a further proficiency trial was requested in March /April 2014 and the results submitted are attached in Appendix 6.

**Inter-laboratory Validation Studies on the Determination of Alkaline Phosphatase (AP) activity in cheese**

The UK-NRL was also invited to participate in a validation study for AP activity in cheese in December 2013 (Appendix 7). This study coincided with the Proficiency Trial above and allowed time to be saved by only requiring one calibration of the channels on the Fluorophos machine for the cheeses being tested.
The types of cheese submitted for the validation study was the same as for the proficiency trial (6 portions of hard and 2 portions of semi-hard cheese from pasteurised cow's milk). The preliminary report on repeatability values can be seen in Appendix 4.

Participation in a further validation study was requested in March /April 2014 and the results submitted are attached in Appendix 8.

**Alkaline Phosphatase (AP) determination in cheese - Survey on the cost of the reagents**

The EU-RL noted some differences in the prices of reagents for AP determination charged by local dealers. They therefore decided to compile information to be used as a basis for discussion with the manufacturing company, Advanced Instruments, in an attempt to get price harmonization for all NRLs participating in trials.
The EU-RL Milk and Milk products conducted a small survey on the cost of the reagents for this methodology prior to the 16$^{th}$ Workshop and the proficiency and validation trials on AP determination in cheese scheduled for the end of 2013. The UK-NRL responses are detailed in Appendix 9.

## Somatic Cell Counts

### Inter-laboratory proficiency testing trial for Somatic Cell Counts (SCC)

The EU-RL organized an inter-laboratory proficiency testing trial for the NRLs for Milk and Milk Products on the counting of somatic cells by the reference method, Standard EN ISO 13366-1, prescribed by EC Regulation 2074/2005 modified by EC Regulation 1664/2006.
Samples (n=6) of raw cow's milk were sent during weeks between the 7th and the 18th of October, 2013 and all were processed within these dates as requested. A preliminary report issued by the EURL in October 2013 indicates that the UK-NRL's (Laboratory number 14) results had satisfactory z-scores. The full preliminary report is attached in Appendix 10.

### Certified Reference Materials (CRM) for Somatic Cell Counts (SCC)

The subject of the development of CRM's for SCC had been discussed at the 15th workshop of the NRLs for Milk and Milk Products on
3-5 October 2012. As a result of these discussions the EU-RL decided to undergo a feasibility study on the preparation of reference materials and an estimation of market needs through the NRLs.
The UK-NRL sent a questionnaire at the request of the EU-RL to the UK network of laboratories in April 2013 to canvass for interest in a need for CRM for SCC in milk. The cover letter and questionnaire forwarded are attached in Appendices 11 and 12. No completed questionnaires were received and it was therefore concluded that none of the UK laboratories have a requirement for Certified Reference Materials for somatic cell count in milk. This nil response was reported to the EU-RL.

## Comparison study between Plate Count Agar (PCA) and Milk Plate Count Agar (mPCA) for total viable counts of milk and milk products

At the previous workshop (3-5 October 2012 at Maisons-Alfort) the EU-RL considered that it would be beneficial to undertake an investigation among NRLs to compare PCA and PCA with milk for total viable counts in

milk and milk products, in the framework of EN ISO4833. UK-NRL volunteered to participate and completed 30 samples of raw milk by the protocol outlined by the EU-RL by July 2013. A report of the work carried out at UK-NRL is included in Appendix 13. A full report from the EU-NRL has not yet been issued.

## Official Control Laboratories Status

A questionnaire was circulated to the OCLs listed on the FSA website as in September 2013 to establish their current status in relation to tests performed, accreditation and quality assurance evidence. Appendix 14 and 15 contain the letter and questionnaire forwarded to them. The current status for the OCLs are summarised in the report in Appendix 16.

## Establishment of Conversion Factors between alternative methods and reference methods for total viable count in raw milk

### Establishment of a Conversion Factor for the UK

Alternative methods such as the Bactoscan™ and Bactocount™ systems are used for measuring the total viable microflora of raw milk in many Member States. The testing of raw milk for total viable count is for one or both of two principal reasons viz. enforcement purposes (EU Regulation 853/2004) or to enable the operation of quality payment schemes.
The alternative methods measure all the viable bacteria in the sample, even those within clumps while traditional viable plate counting methods cannot discriminate between cells within clumps and single cells. This means that the value obtained with alternative methods will likely be consistently higher than the value obtained using a traditional plate count. This necessitates the use of a conversion factor to transform the value obtained with alternate methods to its plate count equivalent since the latter value is used for enforcement purposes.

The UK-NRL is required by the FSA to establish a conversion factor in the UK. The conversion factor is needed to facilitate comparison of automated test results carried out by members of Dairy UK's Farm Assurance Scheme with the legislative limit based on the reference

(plate count) method. None of the OCLs within the region use an automated method for enforcement purposes by the relevant competent authority.

There are currently only a few such machines in the UK and they are chiefly used by commercial dairy organisations in support of quality payment schemes, rather than enforcement purposes.
The UK-NRL has therefore approached these companies to participate in a study to establish this factor for the UK. A scoping study along with associated costing has been completed by the UK-NRL and submitted to the FSA for comment and approval. It is anticipated that the work will be undertaken in the financial year 2014-2015.

**Harmonisation of conversion factors between alternative methods and reference method for total viable count in raw milk.**

At the 2011 workshop, it had been agreed that the EU-RL would launch a working group with interested NRLs to investigate the possible harmonization of conversion factors at European level and more particularly to assess the possibility of having one conversion factor per apparatus and per animal species.
The first working group meeting took place on 3 October morning 2012 in Maisons-Alfort and it was decided that the EU-RL would analyze with a linear mixed-effect model raw data obtained by the NRLs obtained during the establishment of national conversion factors. A request for the data was sent out in July 2013 with the required information listed in the document in Appendix 15. This exercise has not yet been completed in the UK however the EU-RL were informed that the data would be collected during the proposed study and forwarded to them on completion.