NMKL Newsletter
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Newsletter for the Nordic Committee on Food Analysis

Contents

www.nmkl.org
E-mail: **nmkl@vetinst.no**

Evaluation of method bias using results derived from the analysis of certified reference materials

NMKL PROCEDURE NO. 9 (2007), VERSION 3

Many laboratories use certified reference materials (CRMs) on a routine basis as a standard tool in Quality Assurance activities. The statistical information provided with the CRM may vary between different producers. The importance of using an appropriate CRM as a tool in a laboratory's quality control procedure, is defined in ISO/IEC 17025, and their use is required by most accreditation bodies. It is therefore important that there are relevant and easy-to-use evaluation procedures available to the analyst.

The primary purpose of the use of a CRM, is to establish the method trueness, which is expressed as bias. This is usually done during the method validation. After a method has been validated and taken into routine use, CRMs may be used as part of the analytical quality control procedures to safeguard that the method performs as expected over time.

A CRM can also be used to check the method at another concentration level or for a matrix outside the scope of the validated method. The method bias is established by comparing the difference between the measurement result and the certified value with an uncertainty value that may comprise one or several components, depending on the purpose of the investigation.

Results from CRMs are often published in both national and international reports and journals in order to guarantee the reliability of a series of analytical results. It is a common misconception that a found result, single or a mean of several measurements, must fit within the 95% confidence interval given in certificates. An objective evaluation using a statistical function is very rarely performed. Mostly the CRM results are reported in terms such as "- were close to the certified value", or "- overlapped the certified range". This observation has been described previously, and eventually led to the conclusion that available guidelines on the use of CRMs are not well known among analysts, and consequently very rarely used. Furthermore, they do not always provide the simple evaluation procedure required by the analyst.

Analytical methods are often validated in a collaborative trial and according to a strict protocol. Although the use of (one or several) CRMs is recommended in such trials, the protocols give no guidance regarding the evaluation of the results. To remedy this shortcoming, this procedure provides an instruction for the calculation of the method bias in collaborative trials. *(to be continued on page 2)*

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New version of NMKL Procedure No. 9, continued:

The intention of this procedure is thus to offer a set of instructions that are easy to use and that provide the analyst with the basic statistical information that is often needed when it comes to evaluating the trueness of analytical surveys and the bias in method validation.

"The previous version of NMKL Procedure No. 9 was partly based on how CRMs should be evaluated for control charts and changes over time. The statistical model used gave lots of information, but was, however, found to be hard to understand. In the new version, the calculations are considerably simpler and result in a z-score (well known for participants in proficiency testing schemes (PT programs)) or a zeta-score (e.g. for the evaluation of CRMs in collaborative validation studies). These give direct information on whether or not the results can be considered acceptable. We hope that the revised procedure will be more generally useful than the previous edition, "says project leader **Lars Jorhem (picture to the left)**.

The revision of the procedure has been conducted by a project group within NMKL, lead by Lars Jorhem, National Food Administration, Sweden
Further, the following experts participated:

Jens Sloth	National Food Institute, the Technical University of Denmark,
Kirsti Nuotio	Finnish Customs Laboratory
Heida Palmadottir	The Icelandic Fisheries Laboratories
Kåre Julshamn	National Institute of Nutrition and Seafood Research, Norway

Corrections to NMKL Method No. 185, 2007: Acrylamide. Determination in bakery and potato products by liquid chromotography tandem mass spectrometry (LC-MS-MS).

NMKL Method No. 185, 2007 was announced in and distrubed to the NMKL subscribers along with, NMKL Newsletter No. 65, May 2007. It was later found necessary to specify that two stock solutions are prepared in 5.1, not only one. In the following, the changes (the added words) are underlined.

5. STANDARDS

5.1 Stock solutions of acrylamide and acrylamide-D_3, 1000 µg/mL
Weigh to the nearest 0.05 mg about 100 mg acrylamide (4.1) in one volumetric flask and acrylamide-D_3 (4.2) in another volumetric flask. Dissolve in water and dilute to 100 mL. Solutions can be stored at 4°C for at least 3 months.

5.2 Internal standard solution, 10 µg/mL
Transfer 1000 µL of stock solution of acrylamide-D_3 (5.1) to a 100 mL volumetric flask and dilute to volume with water.

5.3 Internal standard solution, 1000 mg/mL
Transfer 5000 µL of the internal standard solution (5.2) to a 50 mL volumetric flask and dilute to volume with water.

5.4 Acrylamide standard solution, 100 µg/mL
Transfer 5000 µL of the stock solution of acrylamide (5.1) to a 50 mL volumetric flask and dilute to volume with water.

Update of the references in NMKL Procedure No. 16, 2005: Sensorial Quality.

The list of references for the procedure is supplemented and updated. The update is available at www.nmkl.org under News and as a link in the list of publications.

Corrections to NMKL Method No. 183, 2005: Quality control test for drinking water.

In table 1, Annex 2: Preparation of reference materials and training assessors for the evaluation of odour and taste in drinking water, corrections are made for the basic taste solutions and standard solutions for sour/acidic, sweet, salty and bitter. The corrections are available as a link in the list of publications on NMKL's home page.

NMKL's prices for 2007 and 2008:

- Online subscription, a complete method collection with continuous updates, for existing subscribers: NOK 3 000 for 1-3 users.
- New subscription for online method collection: NOK 5 000
- Annual hard copy subscription: NOK 2 000
- Annual electronic subscription via e-mail: NOK 1 500
- Single NMKL methods: NOK 400
- Single NMKL procedures (guidelines): NOK 300

The following NMKL methods are available in Finnish:

- No. 185, 2007: Acrylamide. Determination in bakery and potato products by liquid chromotography tandem mass spectrometry (LC-MS-MS).
- No. 186, 2007: TRACE ELEMENTS - As, Cd, Hg, Pb and other elements. Determination by ICP-MS after pressure digestion.

New NMKL Method:

NMKL Method No. 187, 2007: *SALMONELLA*. Detection in foods, faeces and materials from primary animal production using MSRV.

The NMKL Method

This method describes the detection of motile *Salmonella* in foods, faeces and other materials from primary animal production. The method is applicable to all kinds of foodstuffs.

The method is a variation of NMKL Method No. 71, in which the selective enrichment broth (Rappaport-Vassiliadis soy peptone broth) has been substituted by a semi-solid enrichment medium (Modified Semi-solid Rappaport-Vassiliadis; MSRV). This medium is intended for the detection of motile *Salmonella*, and is less appropriate for the detection of non-motile *Salmonella*. If (from experience) non-motile *Salmonella* or *Salmonella* exhibiting poor motility are expected, it is advised to analyse non-swarming growth on MSRV further, and/or to use a liquid-selective enrichment in addition to MSRV.

The following four separate steps are required to detect *Salmonella* most efficiently:

- Pre-enrichment for approx. 18 hours.
- Selective enrichment by MSRV for approx. 24 hours
- Plating out of suspect, positive, and swarming zones on two selective agar plates and incubation for approx. 24 hours
- Confirmation

These steps are necessary because *Salmonella* often occurs in low numbers, sometimes sublethally injured, and often in the presence of much greater numbers of other bacteria of the *Enterobacteriaceae* family.

Experts

This NMKL method has been elaborated by **Jeppe Boel** (picture to left) and **Dorte Lau Baggesen** (picture to the right), The National Food Institute, Technical University of Denmark. The following contact persons have also contributed: Tuula Johansson, Evira, Finland, Eggert Gunnarsson, Institute of Experimental Pathology, Keldum, Iceland, Kofitsyo S. Cudjoe, National Veterinary Institute, Oslo, Norway, Erik Eriksson, National Veterinary Institute, Uppsala, Sweden. The method is not validated collaboratively.

Salmonella and Salmonellosis

Salmonella was named after Daniel Edward Salmon, an American veterinary pathologist, *although* it was actually his partner Theobald Smith (better known for his work on anaphylaxis) who first discovered the bacterium in pigs, in 1885.

Salmonellosis is an infection caused by *Salmonella* bacteria. There are over two thousand serotypes of *Salmonella* bacteria, and most of them can cause illness in many species, including humans. The ability to cause illness varies among the different serotypes of *Salmonella.*

Salmonella bacteria are found all over the world and both animals and humans can be healthy carriers who may infect animals and humans. The bacteria are excreted with faeces, and contaminate through polluted feeds, food or water, or through contact with infected animals or humans. *Salmonella* grows well in perishable foods which are stored without being properly cooled. The bacteria can also survive a long time in dry foods such as spices and chocolate.

With the exception of sheep, which can be carriers of *Salmonella diarizonae*, Nordic farm animals are rarely infected by *Salmonella*. However, some serotypes of the bacteria are somewhat common in wild birds and hedgehogs, and this can cause *Salmonella* infections in animals and humans. Exotic reptiles like turtles, lizards and snakes are often carriers of *Salmonella*.

The time between being infected and experiencing symptoms of illness, is between 24 and 72 hours. The severity of the symptoms varies a lot. Some people do not notice the infection at all, while others suffer from serious diarrhoea leading to excessive loss of fluids. The most serious situation occurs if the bacteria get into the blood. This can lead to blood poisoning which is highly dangerous. Children, elderly people and persons with weakened immune systems, are most severely affected by Salmonella infections. Fortunately, Salmonella is seldom lethal. Great amounts of *Salmonella* bacteria need to be present in order to cause illness. The bacteria do not grow at fridge temperature and are killed by frying and cooking. The two most common *Salmonella* bacteria in the Nordic countries are: *Salmonella entiritidis* and *Salmonella typhimurium*.

Salmonella typhimurium may lead to typhoid fever and can often be ascribed to bad hygiene and water quality. The illness has an incubation time of 1 – 2 weeks, but this varies. The symptoms are primarily high fever. However diarrhoea, rashes, nausea and constipation are also common. During the first world war, a vaccine against the bacteria was introduced for the very first time.

Salmonella entiritidis can be found in meat products (especially in poultry and pork). The incubation time for this disease is about 48 hours, but this also varies.

sources: www.vetinst.no (bank of facts), Wikipedia

New IDF NMKL Method:

NMKL Method No. 188, 2007: Nitrate. Determination in milk and milk products by enzymatic reduction and spectrometry after Griess reaction.

The NMKL Method

This method describes the determination of the nitrate content of milk and milk products by spectrometry after enzymatic reduction and Griess reaction.

The method is applicable to whole, partly skimmed, skimmed and dried milk, as well as to hard, semi-hard and soft cheeses; processed cheese; whey cheese, caseins, caseinates, dried whey and milk protein concentrates.

A test portion is dispersed in warm water. The fat and proteins are precipitated according to Carrez and filtered, or by using ultra-filtration. The nitrate is reduced to nitrite in a portion of the filtrate by means of nitrate reductase. A red-violet azo dye is developed in portions of both the unreduced filtrate (for nitrite) and the reduced solution (for nitrate), by addition of sulfanilamide and N-1-naphthyl ethylenediamine dihydrochloride. The product is then spectrometrically measured at a wavelength of 540 nm (Hg 546 nm).

The nitrite content of the original sample (matrix blank) and the total nitrite content after reduction of nitrate, are calculated by comparing their measured absorbance with those of a set of sodium nitrite standard solutions. The nitrate content is then calculated based on the difference between these two contents.

The method is validated in two collaborative studies. The latest study was carried out in 2003/2004 by Christina Bäckman, Finnish Food Safety Authority and Michael Carl, MUVA Kempten, Qualitäts- und Laborzentrum Milchprodukte, Lebensmittel, Umwelt, Germany.

The 14 laboratories who participated in this study, analysed processed cheese (including reference materials), freeze dried cheese, skimmed milk powder, whey powder, whey protein concentrate and whole milk powder. The levels of nitrate in the samples varied from 1.3 – 160 mg /kg. The lowest validated level with a satisfactory precision (Horrat value ≤ 2), was approx. 18 mg/kg. According to the results, it seems that the best results are obtained when using ultrafiltration. The results are included in the method.

Experts

NMKL's referee for the elaboration and validation of this method has been Christina Bäckman, Finnish Food Safety Authority. She has cooperated with IDF's referee, Michael Carl, MUVA Kempten, Qualitäts- und Laborzentrum, Kempten, Germany. Furthermore, the following experts have contributed: Torben Leth, The National Food Institute, Technical University of Denmark, Torstein Karlsson Osta- og smjörsalan sf., Reykjavik, Iceland, Gudmund Bråthen, Eurofins Norsk Matanalyse, Norway and Christian Magnusson, Arla Foods Innovation, Stockholm, Sweden.

About Nitrate

The toxicity of nitrate is in itself low, but nitrate can form nitrite in foods and in the intestines. Nitrite in considerable concentrations is toxic to humans. Lots of N-fertilisers provide a high content of nitrate. Studies show that ecologically grown products contain less nitrate than conventional ones.

Nitrate is a preserving agent which can be added to hard, solid and semi-hard cheeses. The maximum limit is 50 mg sodium nitrate /kg cheese.

The most important objective for using nitrite and nitrate as a preserving agent is to restrain or stop the growth of undesirable microorganisms. In this context, *Clostridium botulinum* is especially mentioned. Nitrate has little or no antibacterial influence by itself, but as it to a certain degree is transformed into nitrite, it acts as a reservoir for nitrite.

It is not allowed to use nitrate in the production of ecological cheese.

Christina Bäckman

News from NordVal

Roche Diagnostics GmbH & BIOTECON Diagnostics GmbH have received NordVal certificates for the following proprietary methods:

NordVal certificate No. **26** is issued for:

- Roche Diagnostics LightCycler food**proof** *E.coli* O157 Detection Kit in combination with ShortPrep **food**proof II Kit
- BIOTECON Diagnostics **food**proof *E.coli* O157 Detection Kit in combination with **food**proof ShortPrep II

LightCycler **food**proof *E.coli* O157 Detection Kit is supplied in a read-to-use format. It includes all reagents necessary for the amplification and detection of *E.coli* O157 (including *E.coli* O157:H7). The kit allows for detection of the food-borne pathogen within 24 hours. The test consists of the following three steps:

- Selective sample enrichment for 20 hours
- Sample preparation using the Short Prep **food**proof II Kit
- Amplification and detection with the LichtCycler **food**proof *E.coli* O157 Detection Kit and Light Cycler Instrument.

Confirmation by biochemical or serological investigations is not necessary for PCR analysis. This proprietary method is validated against ISO 16654:2001- Horizontal method for the detection of *E.coli* O157. There were no statistical differences between the analytical results of the proprietary method and the ISO standard. NordVal's approval is valid for 2 years, i.e. until 1 November 2009.

NordVal certificate No. **25** is issued for:

- Roche Diagnostics LightCycler **food**proof *Listeria monocytogenes* Detection Kit in combination with ShortPrep **food**proof II Kit
- BIOTECON Diagnostics **food**proof *Listeria monocytogenes* Detection Kit in combination with **food**proof ShortPrep II Kit

NordVal has compared the results from an internal method comparison and a collaborative study of this test kit with ISO 11290:1996/Amd 1:2004 for the detection of *Listeria monocytogenes* in foods and environmental samples. The studies were conducted by Biotecon Diagnostics GmbH, Germany. NordVal concluded that it has been satisfactorily demonstrated that the requirements of the NordVal validation protocol are fulfilled. There were no statistical difference between the methods.

The LightCycler®**food**proof *Listeria monocytogenes* Detection Kit provides a method for rapid detection of Listeria monocytogenes DNA isolated from enrichment cultures inoculated with food samples that are potentially contaminated with Listeria monocytogenes. The possibility of obtaining rapid results is becoming increasingly more important within food control as well as the food industry.

LightCycler 2.0 Instrument

NordVal certificate No. **23** is issued for:

- Roche Diagnostics LightCycler food**proof** *Salmonella* Detection Kit in combination with ShortPrep food**proof** I Kit or MagNa Pure LC DNA Isolation Kit III
- BIOTECON Diagnostics **food**proof *Salmonella* Detection Kit in combination with **food**proof ShortPrep I Kit or MagNA Pure LC DNA Isolation Kit III

NordVal has compared the results of a comparison of this proprietary method with ISO 6579:2002 for the detection of *Salmonella* spp in foods, feeds and environmental samples. The method comparison consisted of an internal as well as a collaborative method validation study. The validations were conducted/organised by Biotecon Diagnostics GmbH, Germany. NordVal concluded that it has been satisfactorily demonstrated that the requirements of the NordVal validation protocol are fulfilled. There was no statistical difference between the methods.

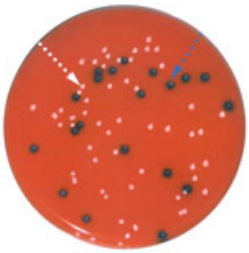
The LightCycler®**food**proof *Salmonella* Detection Kit is intended for food-testing purposes. The kit provides primers/probes, ready-to-use amplification and detection reagents, and a control template to ensure accurate amplification of *Salmonella* DNA, using a hot start methodology on the LightCycler® 1.5 or 2.0 Instruments.

To ensure maximum reliability, an internal control has been included that will prevent misinterpretation of false negative results due to amplification inhibition.

Bio Rad has received NordVal certificate No. 22 for RAPID'L.MONO

RAPID'L.MONO is applicable for detection and enumeration of *Listeria monoctyogenes* and detection of other species of *Listeria spp.* in all foods and in environment samples.

The new version of RAPID'L.MONO has been validated by Institute Pasteur de Lille. The validation is conducted according to EN ISO 16140:2003. RAPID'L.MONO was compared with EN ISO 11290-1/A1:2004 (detection part) and EN ISO 11290-2/A1:2004 (enumeration part). The results are evaluated against the criteria given in the NordVal validation protocol and are found to be satisfactory for:



- Detection of *Listeria Monoctytogenes* within 24 hours after 24 hours incubation
- Enumeration of *Listeria Monocytogenes* within 24 hours after 24 hours incubation
- Detection of others *Listeria spp.* within 24 hours after 48 hours incubation

The reading and enumeration of *Listeria* are easy due to RAPID'L.mono's chromogenic principle. *L.monocytogenes* forms blue colonies without halo while *L.spp.* forms white colonies. Confirmation is not necessary.

For more information about which methods NordVal has certified, please visit the NordVal pages at www.nmkl.org. Click on the logo of NordVal and then on "List of Methods".

Courses /seminars /workshop

Workshop: Method Performance and Analytical Uncertainty

Date and place: Sunday 9 March 2008, Hotel Helia, Budapest. The workshop is arranged in connection with the meeting of Codex Committee on Methods of Analysis and Sampling (CCMAS) which is held in Budapest 10 – 14 March 2008.
The organisers are international organisations such as ICC, AOCS, BIPM, IUPAC, NMKL and other members of InterAgency Meeting.

Background: From discussions at previous CCMAS meetings, it was evident that there is a need for clarification and harmonisation regarding the understanding of measurement uncertainty; what is measurement uncertainty and method performance characteristics, how should method performance characteristics, certified reference materials and proficiency testing schemes be used to estimate and check measurement uncertainty, and how should measurement uncertainty be used?

Target group: CCMAS and Governmental delegates.

Tentative Program:

10.00 – 10.30	General introduction – historical overview of developments in Codex with respect to measurement uncertainty (*Roger Wood*)
10.30 - 11.00	Introduction to measurement uncertainty (*Lars Jorhem, NMKL*)
11.00 - 11.30	Guides to uncertainty in measurement (*Ralf Josephs, BIPM)*)
11.30 - 12.00	Group discussion and questions
12.00 - 13.30	Lunch
13.30 - 14.00	Method performance characteristics and measurement uncertainty (*Steve Ellisson, LGC*)
14.00 - 14.30	Group discussion and questions
14.30 - 15.00	Method validation, PT schemes and Measurement Uncertainty (*Franz Ulberth, IRMM*)
15.00 - 15.30	Group discussion and questions
15.30 - 16.00	Proper interpretation and use of stated values and uncertainties (*H. Emons, IRMM*)
16.00 - 16.30	Tea/coffee break
16.30 - 17.00	The way forward – presentation of paper (to be considered by CCMAS) (Australian delegate?)
17.00 - 17.30	Discussion

Registration: The workshop will be free for CCMAS and IAM delegates.
Registration fee for other participants: 95 Euro
Registration to: diana.feher@icc.or.at or nmkl@vetinst.no for reforwarding before 20 February 2008

Course: Pure and tasty drinking water?

Pure, fresh and tasty drinking water. Most people in the Nordic countries take this for granted. However, the quality of this water has to be checked regularly, both chemically and microbiologically – as well as sensorially. Sensory analyses are essential in this context, because they are highly relevant to the usage of drinking water. However, sensory tests are performed differently at various testing locations. Therefore, NMKL has developed a simple, fast and practical method for **sensory quality control of drinking water**. The method is one of the very first sensory methods to be validated collaboratively, and provides objective and repeatable results when used correctly. NMKL is now arranging courses in this method.

Target group: Personnel working within water supply and in other locations where there is a need for a fast, simple and objective sensorial control of drinking water.

Scope: The courses will include sensorial theory of relevance for the target group, a thorough description of the method and a number of practical assessments of drinking water. The courses will be based on NMKL Method No. 183, 2005: Sensory quality control test for drinking water, and NMKL Procedure No. 11, 2002: Procedure for sensory analysis of drinking water / Juomaveden aistinvarainen arviointi (Finnish).

Date and place:

Sweden: 31 January 2008, Lackarbäcks vattenverk, Göteborg.

Denmark 6 February, 2008, Danmarks Fiskeriundersøgelser, Afd. for Fiskeindustruel Forskning, Kgs Lyngby.

Finland: 7 February 2008, Evira, Helsinki.

Iceland: 12 February 2008, Matís, Reykjavík.

The course was held in Norway in November 2007, and the feedback has been most positive.

Language and lecturers:
In Norway, Sweden and Denmark the courses will be held in Norwegian by Steffen Solem from Eurofins - The Norwegian Institute for Food and Environmental Analysis.
In Finland, the course will be held in Finnish by Leena Lilleberg from Evira.
In Iceland, the course will be held in English by Steffen Solem from Eurofins - The Norwegian Institute for Food and Environmental Analysis.

Program:
09:00 Introduction
09:15 Lecture: Sensorics as an analytical method
10:00 Smell test of drinking water, Part 1
10:30 Lecture: Factors of importance for practical performance of sensory analysis (incl. some quality assurance)
11:15 Smell test of drinking water, Part 2
11:45 Discussion of smell test
12:00 Lunch
12:30 Detailed discussion of NMKL No. 183
14:00 Practical tasting of water
16:00 Closure

Course Fee: NOK 2500 (incl. lunch and materials)

Registration Deadline:
10 January 2008 for courses in Sweden and Denmark
15 January 2008 for courses in Finland and Iceland

Registration to:
NMKL - e-mail: **nmkl@vetinst.no**
Note! Limited number of participants.

Course:

Guidelines for requirement specifications for food analysis
- Checklist for considerations in connection with tendering procedures

NMKL plans to arrange courses in the Nordic countries on which factors that should be considered in connection with tendering processes. The courses will be based on NMKL Procedure No .17, 2007, with the same title as the course.

Background: To demonstrate product quality and safety according to current regulations, the authorities need to perform analyses. Previously, such analyses were performed (mainly) by official laboratories. Now private laboratories have taken over this function in many of the Nordic and European countries, and the competition between them is fierce. Before the authorities invites tenders, it is necessary to describe and specify the task in detail. Also, the food industry or others that may need frequent analyses and extensive analytical services, have to specify their needs whenever they purchase analyses.

There are many questions that have to be answered and allowances that have to be made before a requirement specification is ready. The Nordic Committee on Food Analysis (NMKL) has compiled the material for these guidelines to help the authorities, laboratories, food industry players or others to specify their needs. The guidelines list the requirements to be considered. Competence in the specific laboratory field is needed to select the most suitable requirements for the specific task.

These guidelines do not include general administrative rules related to the publication of tender notices and prequalification of laboratories. Each contracting authority has to check the regulations and recommendations on what documentation is necessary and useful to require. *(Extract from NMKL Procedure No. 17)*

Target group:

- Food control authorities and other authorities – buyers of external analyses
- Laboratories buying internal/external analyses
- Food producers buying analyses for internal control
- Laboratory personnel – to learn the requirements set by the authorities

Program content:

- General information about the guidelines
- General requirements for the purchase of services (incl. public requirements)
- Sampling, transportation and receipt of the samples at the laboratory
- Sample preparation, analytical methods, report & quality assurance
- Economical aspects
- Evaluation of possible laboratories with examples from microbiology, chemistry and sensorial analyses

Date and place: Norway + Sweden: May 2008
Denmark, Finland + Iceland: October/ November 2008
Language: Scandinavian in the Scandinavian countries. English in Finland and Iceland.
Fee: Approx. NOK 2500, incl. course material (NMKL Procedure No. 17) + lunch and refreshments
Registration to: The office of the NMKL Secretary General.

If you have any questions or comments, or wish to contribute to the course, please contact one of the course organisers:

Denmark: **Lisbeth Lund**, The Danish Accreditation and Metrology Fund – DANAK (llu@danak.dk)
Finland: **Raymond Tuominen,** The Finnish Meat Research Insitute (raymond.tuominen@ltk.inet.fi)
Iceland: **Franklin Georgsson**, Matis ohf (franklin@matis.is)
Norway: **Astrid Nordbotten** (project leader), Food Control Authority (asnor@mattilsynet.no) and **Urd Bente Andersen**, AS Vinmonopolet (urd.bente.andersen@vinmonopolet.no)
Sweden: **Håkan Johnsson**, National food Administration (hajo@slv.se)