NMKL Newsletter
No. 56
June 2004

Newsletter for
The Nordic Committee on Food Analysis

Contents:

Circulation:
1100 in Scandinavian languages
+ 600 in English

ISSN 1502-7406

Courses in estimation and expression of measurement uncertainty in chemical analysis

NMKL will be arranging courses in the estimation and expression of measurement uncertainty in chemical analysis. The courses will be based on the 2nd edition of NMKL procedure no 5. Theory and practical aspects will be covered. The courses will include training in the different steps of calculating the measurement uncertainty required for accreditation according to ISO 17025 such as:

- Specifying the measures
- Identifying sources of uncertainty
- Simplifying by using existing information
- Quantifying components
- Converting all components to standard uncertainty
- Calculating standard uncertainty of repeated measurements
- Recommendation for the expression of the estimated measurement uncertainty.

Examples and exercises using basic statistics will be included. Furthermore, the use of an Excel spreadsheet for simplifying the calculations will be demonstrated. The main focus will, however, be on how to best utilize the results from validation studies in estimating the measurement uncertainty.

The author of this NMKL procedure, Joakim Engman, National Food Administration, Uppsala, Sweden, will be the lecturer of the courses, which will be arranged:

- ✓ Monday, 15 November, 2004 at the National Food Administration, Uppsala, Sweden
- ✓ Thursday, 18 November at EELA, Helsinki, Finland
- ✓ Monday, 22 November at the Danish Institute for Food and Veterinary Research, Søborg, Denmark
- ✓ Thursday, 25 November at the National Veterinary Institute, Oslo, Norway
- ✓ Monday, 29 November at the Environment and Food Agency, Reykjavik, Iceland.

The courses in Finland and Iceland will be held in English, the others in Swedish.
Course fee: NOK 1200.
Please register to the NMKL general secretariat before 1 November 2004.

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NMKL welcomes any input or comments on the NMKL Newsletter and on NMKL's working programme.

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Chairman of NMKL: Ole Bjørn Jensen, Scanpharm A/S, Denmark.

New NMKL methods

NMKL method no 44, 6th. Ed., 2004:
Coliform bacteria. Determination in foods and feeds.

This method was revised in order to include results from a collaborative study. Gro S. Johannessen and Marianne Økland National Veterinary Institute, Oslo, Norway, arranged the study. NMKL received financial support from EK-Livs on this project.

The following laboratories participated in the study:

Regional Veterinary and Food Control Authority Nordjylland,
Regional Veterinary and Food Control Authority Copenhagen,
Regional Veterinary and Food Control Authority Vejle,
Regional Veterinary and Food Control Authority Nordøstsjælland,
Regional Veterinary and Food Control Authority Copenhagen, Local office Bornholm,
Regional Veterinary and Food Control Authority Århus,
Eurofins Denmark AS,
Municipal Food Control Authority Haugaland,
Norsk Matanalyse,
Municipal Food Control Authority Midt-Rogaland,
The Environment and Food Agency, Reykjavik
SYNY Laboratory service
Helsingfors Environmental Laboratory
Steins Laboratory AB, Lund,
Arla Food Innovation, Stockholm.

Twelve laboratories forwarded valid results on minced meat, lettuce and whole grains. Cheese was also included in the study. However, as 9 of the 12 laboratories incubated the cheese samples at a different temperature (37 °C) than described in the method (30 °C), these results had to be excluded. The other results are given in the method. The study showed that the reproducibility seems to be matrix dependent. The reproducibility was best for minced meat, and not very good for lettuce and whole grains. Lettuce grows close to soil, and it is known that soil and water bacteria present might give false positives. *Erwinia* spp., belonging to *Enterobacteriacae*, is a part of the natural flora of whole grains and will interfere in the analysis on coliform bacteria in this matrix. This was obvious at low levels of inoculation for which several false negative results were obtained. For these matrices there is a possibility that the background flora will conceal the targets of the method, hereby giving poor reproducibility results. The results of the study also indicate that reading of the plates can be difficult. Therefore, it is important that the persons who perform the analyses are experienced in the method.

The method is applicable to all types of foods and feeds. However, foods and feeds containing other sugars than lactose, e.g. saccharose, may cause non-coliform bacterial growth, with colonies resembling those of coliforms.

Strains of e.g. Aeromonas, Flavobacterium and Erwinia, which sometimes occur in samples from sea water, raw fish, raw vegetables and grain, may grow on the plating medium to produce almost typical colonies. Confirmation of selected colonies is therefore also needed in these cases.

NMKL method no 59, 4th. Ed., 2004:
Microbiological examination of fully preserved canned foods.

Jan Thomas Rosnes, Norconserv, Stavanger revised this method. The method is a routine method for microbiological examination of fully preserved canned foods, i.e. foods packed in containers which protect against the intrusion of microorganisms during and after heat treatment. The purpose of the examination is to ascertain whether the contents of fully preserved cans are sterile, or whether they contain microorganisms as a result of under-sterilization or re-contamination.

The heat treatment, alone or in combination with other treatments, must be sufficient to kill all pathogenic microorganisms and to prevent other microorganisms from growing in the conditions under which the food is normally distributed and stored. The purpose of the examination is to ascertain whether the presence of given viable microorganisms can be demonstrated when culturing samples of approx. 1 g of the food on given substrates.

The microbiological examination is supplemented by direct microscopy of the material, measurement of the pH, inspection and examination of the container and sensory analysis of the content.

Rosnes informs that the main changes in this new version are:

1. The pre-incubation times are changed. Now, the times harmonise with the directives given in the Nordic countries. Furthermore, incubation for thermophilic bacteria is included.

2. An interpretation form for the examination of the entire container, including the packaging, the seams and sensory analysis of the content, is included.

3. Previously, there was a great infection danger as up to 4 samples had to be withdrawn from the same container. Now the sampling is to be performed by transferring a representative content from the container to the sterile plates. From these, secondary samples for broth, agar and microscopy are withdrawn.

4. A few changes are made in the composition of the reagents in the culture media in order to harmonise these with commercially available media.

Please note!! If you subscribe NMKL methods as PDF files, but have not forwarded your e-mail address, the new methods will be sent to e-mail addresses found on the institutes'/industry's homepages (e.g. info@xxx.xx). We hope the methods will be forwarded the right person. If you have paid the subscription fee, but still do not receive PDF-files, please give us the correct e-mail address, preferably with reference to the subscription no. (Abxxx).

NMKL method no 150, 3rd. Ed., 2004:
Mesophilic *Aeromonas* species. Determination in foods and feeds.

Øyvin Ørmen, The Norwegian School of Veterinary Science, (NVH), has revised this method. Ørmen informs that a somewhat unexpected composition of species of collected environmental isolates led to the suspicion that the genospecies could not be correct. Ørmen and his colleagues contacted Dr Maria Jose Figueras at the Rovira University in Spain, who has extensive experience in genetic diagnosis on *Aeromonas* spp. Based on this cooperation, NVH established a RFLP technique based on ribosomal genes. They genotyped over 200 clinical and environmental/food isolates from NVH, the Norwegian Institute of Public Health and the University of Barcelona. From these results they concluded that the agreement for environmental isolates was less than 5% and about 50% for clinical species. The deviates were in accordance with literature found elsewhere. The genetic result had a more correct genotype (clinical /environmental) and it was reproducible. An accurate biochemical diagnosis requires several different tests and numerical readings hereof, combined with extensive experience. In addition, environmental and food isolates varys more than the clinical ones, and are harder to determine biochemically. *Genus Aeromonas* with its 17 species is a complex group to deal with. Ørmen and his colleagues thought it was best to limit the NMKL method to genus determination, in order to avoid further confusion in this area of interest. Ørmen et.al. elaborated this revised method based on the previous edition, own experiences and related literature.

Mesophilic *Aeromonas* species may be quantitatively determined by inoculating a known amount of sample on the surface of Starch-Ampicillin-Agar (SAA), and incubating the plates at 37 °C for 24 hours.

Presumptive *Aeromonas* spp. grow as yellow or honey-coloured colonies with a diameter of 2-3 mm, surrounded by a light halo with a width of 2-3 mm. If the plates are covered with a few mL of Lugol's solution, amylase-positive colonies will be surrounded by a clear halo of hydrolysed starch against a dark background.

Prices of NMKL publications.

Invoice fee: NOK 50

	NOK
Subscription fee (annual) PDF-files	**600**
Subscription fee (annual) hardcopies	**800**
Compiled collection of NMKL methods	**2.500**
Method (single)	**200**
Reports	**200 / 250**
Procedures / guidelines	**300**

NMKL method no 178, 2004:
Chloride (salt). Determination in foods by potentiometric titration.

This method is edited by Helena Liukkonen-Lilja, VTT Biotechnology, and Harriet Wallin, National Food Agency, Helsinki, Finland. The method is applicable for the determination of chloride in foods from levels of 0.03%, corresponding to 0.05% sodium chloride.

Soluble chloride is extracted from the sample and thereafter titrated potentiometrically using silver nitrate.

Corresponding methods are studied in two collaborative studies, which is published in the J. AOAC International. One of the studies, which has become an AOAC official method, has been conducted at 10 laboratories on 12 different foodstuffs. The other study is also based on AOAC official methods. Here two methods, based on Volhard titration, are compared to the potentiometric method. This comparison has been performed at 7 laboratories with 3 samples of ground Gouda cheese. The potentiometric method in this comparison is the basis of the official method / standards for the determination of chloride in cheese and cheese products published by IDF, ISO and AOAC International.

This NMKL method harmonises with the following methods: AOAC official method 983.14 and 971.27, IDF Standard 88A:1988 and ISO 5943:1988.

NordVal
Validation

News from NordVal

During the first 6 months of 2004, NordVal has validated and certified the following alternative microbiological methods:

- Bioline Salmonella Elisa Test Selecta
- 3M Petrifilm Select E.coli Count Plate
- Transia Plate Salmonella Gold

Furthermore, NordVal has renewed the following certificates for 2 more years:

- Certificate for 3M Petrifilm Enterobacteriaceae Count Plate.
- Certifcate for Oxoid Listeria Rapid Test
- Certificate for AccuProbe Listeria monocytogenes
- Certificate for AccuProbe Campylobacter

Information on the field of application and the period of time for which the certificates are approved, is available under NordVal on the NMKL web page. For further information, please refer to the producers' manuals.

Sven Qvist on behalf of NordVal

New NMKL procedures

NMKL procedure no 14, 2004:

SENSVAL: Guide on internal quality control for sensory testing laboratories.

A project group within NMKL has elaborated this procedure. EK-Livs has supported NMKL financially on this project.

The project group consisted of:

Per Lea, Norwegian Food Research Institute Matforsk, Norway (project leader and author),
Robert Green Nielsen, The Biotechnological Institute, Denmark,
Ulla Appelbye, Valio Oy, Finland,
Þyri Valdimarsdottir, former employee of the Icelandic Fisheries, Iceland,
Halina Agerhem, former employee of the Swedish Meats, Sweden.

The EU project Profisens, which started up about the same time as this project, includes lot of theoretical material about collaborative method performance studies. This procedure, however, focuses mainly on the internal quality control. The analyses should preferably give (approximately) the same results independent of when and by whom they are performed. Proficiency testing, also called round robin, is frequently used to prove this. We distinguish between proficiency testing and method performance studies. Proficiency testing is a performance test for each laboratory, while a method performance study tests the actual method. The title of this procedure includes the word ”guide”, as it is ment to serve as a general guideline rather than a detailed procedure on how to perform the internal quality control.

In NMKL procedure no 14, the description of the internal quality control is divided into the following main topics:

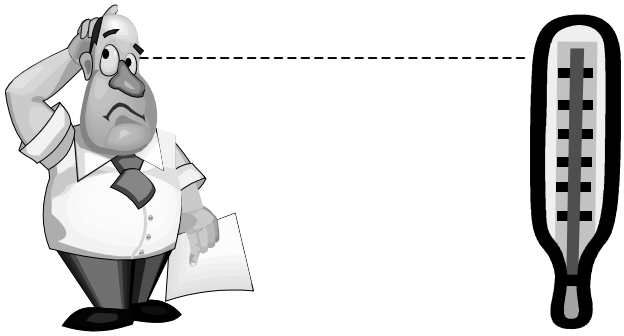
- Choice of sensory panels
- Control of the panels
  - Basic tasting tests
  - Manipulated products
  - Ordinary projects /trials
- Control of the performance of a sensory trial
- Control of the data
- Proficiency testing schemes

NMKL procedure No 15, 2004:

Temperature control in microbiological laboratories.

This NMKL procedure is elaborated by an NMKL project group consisting of:

Lennart Larsson, (project leader and author) LaVet, Sweden,
Lisbeth Lund, DANAK, Denmark,
Margareta Peterzens, ESBO, Finland,
Dóra S. Gunnarsdóttir, Environmental and Food Agency, Iceland,
Gro Johnsen, Midt-Rogaland Municipal Food Control Authority, Norway.



The procedure gives practical guidelines for the daily temperature control routines in a microbiological laboratory, independent of which type of thermometer is used, mercury or electronical.

The procedure is general. It is important to emphasise that the instructions/procedures have to be adjusted to the laboratories own equipment and needs. The controls require use of thermometers which are traceably calibrated to SI units (ISO 17025) in accordance with the laboratories’ own documented procedures.

NMKL procedures No. 14 and 15 are presently only available in one of the Scandinavian languages (No 14 in Norwegian and No 15 in Swedish). The procedures will be translated into English.

NMKL procedure No 5, 2nd Ed.:
Estimation and expression of measurement uncertainty in chemical analysis is now available in English.

See NMKL’s home page: www.nmkl.org
for information about courses, working programme, proficiency testing schemes etc., and NMKL’s web shop for information about NMKL methods and other NMKL publications.